

Andreas Klärner · Markus Gamper ·
Sylvia Keim-Klärner · Irene Moor ·
Holger von der Lippe ·
Nico Vonneilich *Editors*

Social Networks and Health Inequalities

A New Perspective for Research

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Andreas Klärner , Markus Gamper , Sylvia Keim-Klärner ,
Holger von der Lippe , Irene Moor , Matthias Richter ,
and Nico Vonneilich 

“Tell me how much your friends earn and I’ll tell you whether you smoke, what diseases you have and how old you’re going to become!” Part of this statement should be familiar to those who are interested in the connection between social inequality and health. People of comparatively lower socioeconomic status are at higher risk of health problems and are more likely to fall ill and die earlier than those who have a higher income, a higher level of education, or a more prestigious profession. This correlation, often referred to as the “social gradient,” is well-documented and can be shown in

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(almost) all countries of the world on the basis of different health indicators (see, e.g., Mackenbach et al., 2018; Marmot, 2005).

However, the sentence does not ask about your own income, but about the income of your friends. Is this information really meaningful? Does it really make a difference to your own health which friends you have, who you surround yourself with in your everyday life and what social position these people have?

In scientific terms, this sentence establishes a connection between the social position of actors in a person's network of relationships and their own health behavior, morbidity, and mortality. The information about the social status of a person's friends—they may also be family members, colleagues, neighbors, or other more distant acquaintances—is thus intended to provide us with conclusions about health behavior, susceptibility to certain diseases and life expectancy, and possibly about stratum-specific differences in health. If family members live together and share a common household, it is likely that they will have similar health behavior, health risks and stresses, and influences on life expectancy and hereditary diseases. But do people from an individual's wider circle of friends and acquaintances also have an influence on their own health? What new perspectives and insights in connection with health and health inequality can the examination of social relationships yield?

This question will be addressed in the contributions to this anthology. The authors ask not only whether individual social relationships (such as a friend who smokes and encourages others to smoke) have an influence on individual health, but also the interaction within one's own social network. Is someone's health or health behavior more influenced by people who are similar or dissimilar? In short, the contributions in this volume ask whether the structure of social relationships—the social networks in which we are all embedded in our perception, thinking, and acting—has an influence on us in that we are more likely to feel psychologically distressed, fall ill, or die earlier than others. This also raises the question of whether the study of social networks and the occupation with sociological and now interdisciplinary network research can contribute to understanding and explaining health inequalities.

This anthology is the result of several years of collaboration between researchers from different disciplines (sociology, medical sociology, psychology, public health, education, health sciences) with different theoretical and methodological orientations. The collaboration has been funded by the German Research Foundation (DFG) as the Scientific Network "Social Networks and Health Inequalities (SoNegU)" for a period of four years since 2016. The aims of the network were (1) to make sociological network research better known, especially in the German-speaking health research community, and (2) to make the network perspective fertile for the explanation of health inequalities. The aim of this book is to present the current state of research, identify research needs, and point out perspectives for future research.

This introduction aims to show that the inclusion of the network perspective in research on health inequalities can be beneficial. The topic will be presented and discussed in more detail in the following chapters. To this end, we first introduce the basic ideas of social networks research (Sect. 1) and then give a short overview of empirical findings on health inequalities (Sect. 2). Then, in (Sect. 3), we describe the role that sociological network research can play in this context and present our own conceptual theory model where we elaborate on the role of social relationships and

social networks for the (re)production of health inequalities. The proposed model also serves as an orienting framework for many of the individual contributions in this book. At the end (Sect. 4), we give an overview of all articles.

1 The Sociological Network Research

With social networks, we take up a social science concept that is oriented toward basic assumptions in action theory, which assume that individuals do not act as “atoms” but are “embedded” in a relational network of interpersonal relationships (cf. Burt, 1982; Emirbayer, 1997; Granovetter, 1985). The relationships between actors are thereby formative for the behavior of network members (cf. e.g., Wellman, 1988). This relational approach (cf. Emirbayer & Goodwin, 1994) assumes that social processes and actions cannot be explained solely by actor-specific attributes such as sociodemographic characteristics of individuals (e.g., age, gender, ethnicity, and level of education). Rather, they can be explained by their integration into their social environment through family, friends, relatives, or acquaintances. The network perspective thus focuses on the meso-level¹ of social relationships between individuals. The social environment is then understood as a structure of social relationships that opens or restricts the scope for action and also influences, for example, the way in which the actors perceive themselves and their ability to act (cf. Gamper, 2015).

The central point here is that network research not only analyzes individual relationships or dyads, but also how individual relationships are interwoven and how relations within a network are structured (Marin & Wellman, 2011; Borgatti & Halgin, 2011).² Interacting individuals, couples, families, and other interactive units (also institutions or organizations) can thus be understood as networks actors. Cultural norms and values of actors are learned and reproduced, but also changed in socialization processes and in everyday interactions with their fellow alters.³ In the language of recent network theory, actors are “embedded” (Granovetter, 1985) in a relational network of social relationships that opens or restricts possibilities for action (see Emirbayer & Mische, 1998). Depending on the position or “embedding” of the individual in such a network and on the network composition and structure, the actors have, for example, very specific access to resources (e.g., Lin, 2008)

¹The micro-level can be understood as that of the individual actor and the macro-level as the social context (system level) and the framework conditions.

²The concept of the social network has gained popularity through social media platforms such as Facebook and Twitter. It is increasingly used in everyday language and in scientific contexts. In many studies, however, it is used merely as a metaphor for relationships or interactions, without actually looking at the structures of these relationships. Here, structural analyses and network theoretical considerations are missing. It is therefore important to bear in mind that not all works that use the concept of network also adopt a structural network perspective that we propagate here.

³In social network research, the term *alter* (plural: *alters* or sometimes *alteri*) designates the social contacts of a person, which is often called *ego*. Ego and alter are Latin words for I and the other.

and/or information (e.g., Burt, 2004; Granovetter, 1973). Thus, the social network approach is intended to make the active actions and experiences of individuals in the context of interpersonal relationships conceptually understandable and methodologically reconstructable (see chapter “[Social Network Theories: An Overview](#)”).

Although new ideas on “friendship” (Delitsch, 1900), “social circles” (Simmel, 1950), “social integration” (Moreno, 1934), “social structure” (Radcliffe-Brown, 1940), “role concept” (Nadel, 1957), or “figurations” (Elias, 1978) can already be found in classics of sociology, social anthropology, and psychology, the methodological procedure and the related structural analysis are relatively new (Freeman, 2004). In recent years, there has been very dynamic and innovative development on analysis tools for large data sets and visual network research. A wide range of specific survey and analysis methods that can be used in qualitative and quantitative research, and in method-integrative (*mixed methods*) designs, has existed for some time now. Nevertheless, the main focus is on the quantitative evaluation of network data and thus on the causal, as well as statistical, relationships (for a detailed account of the history of relational science, see Gamper, 2015). For more about this, see chapter “[Network Analysis and Health Inequalities: A Methodological Introduction](#)”.

These concepts and methods have found their way into Anglo-American social research—for example, the concepts of strong and weak relationships (Granovetter, 1973), diffusion processes of “good ideas” (Burt, 2004), the division of household chores in paired relationships (Bott, 1957), and health and social structure (Valente, 2010). However, there is still a lack of a foundation in action theory and insufficient knowledge about the mechanisms of social influence in social networks (see, e.g., Smith & Christakis, 2008; Gulati & Srivasta, 2014). There is not much research on social network and social inequalities, either (e.g., DiMaggio & Garip, 2012; Calvo-Armengol & Jackson, 2004). This is partly due to the methodological focus, namely quantitative research. Furthermore, previous research has often focused on positive, supportive relationships. The negative effects (intended or unintended) of social relationships and their structures, such as control and corruption, or the impact and dynamics of conflictual relationships (see chapter “[Negative Ties and Inequalities in Health](#)”), have hardly been investigated thus far. Furthermore, there are hardly any overview books on linking inequality, health, and networks.

2 Health Inequalities

The link between social inequalities and health is considered to be empirically well confirmed, as is evident in practically all countries where data are available (see, e.g., CSDH, 2008; Marmot, 2005; Rostila, 2013; Thurston, 2014; Vonneilich et al., 2011). Social inequalities, or disadvantages, especially in dimensions like “education,” “occupation,” and “income,” thus have a negative impact on both health status (morbidity, mortality) and health behavior (e.g., the number of people in good health and the number of people who are not)—for example, substance abuse, nutrition, and exercise (see Braveman et al., 2011; Brownson et al., 2005; Kanjilal et al., 2006;

von dem Knesebeck & Schäfer, 2009; de Walque, 2010). But other dimensions of social inequality, such as gender and migration background, have also been linked to various health indicators (Singh & Hiatt, 2006).

Current research results show considerable social differences in morbidity and mortality. We only list some examples:

- The average life expectancy of the lowest income quintile is 7.7 years below that of the highest income quintile for men and about 5.4 years for women at age 25 in Canada. Educational inequalities in life expectancy between the lowest and the highest educational level identified similar differences for men (7.8 years) but higher inequalities for women (6.7 years) (Bushnik et al., 2020). Socioeconomic inequalities in life expectancy were found in other countries such as the United States (Chetty et al., 2016; Hill & Jorgenson, 2018) and Germany (Lampert et al., 2019).
- An international systematic review showed that unemployed people have a 63% higher mortality risk compared to the total population (Roelfs et al., 2011).
- Cardiovascular disease mortality, as one of the leading causes of death worldwide, also follows a social gradient: Those with a low socioeconomic position within their life course have about twice the risk of cardiovascular disease mortality and more than twice the risk to die of this disease than those with a stable, high social status across their life (Stringhini et al., 2018). Also, other studies found that socioeconomic position was associated with cardiovascular disease mortality (Tillmann et al., 2017; Rosengren et al., 2019).
- Social differences are also evident in serious health issues such as diabetes mellitus, obesity, depressive symptoms, or cancer (cf. Lampert et al., 2013; Lange, 2014). Socioeconomic status is highly associated with risk behavior and multimorbidity (Katikireddi et al., 2017).
- Mental health problems are more common in people with a low social status (Robert Koch Institute, 2017; Silva et al., 2016).
- Social inequalities are related to differences in health care. For example, Janßen et al. (2012) found in a systematic review that 20 out of 23 reviewed studies provide clear evidence for significant links between higher social status and greater use of healthcare services and offers.
- Health behavior usually differs markedly depending on social status: the lower the social status, the higher the proportion of smokers, those who eat unhealthy food, and those who are physically inactive (Katikireddi et al., 2017; Mackenbach et al., 2017; Petrovic et al., 2018; Moor et al., 2017).
- Despite all efforts, health inequalities have hardly been reduced in recent years and decades. They have often remained constant or show an increase. This trend is evident for various outcomes such as subjective health or mortality (Mackenbach et al., 2016; Granström et al., 2015).

Different theoretical models exist to explain health inequalities (see Mackenbach et al., 2016; van Oort et al., 2005; Moor et al., 2017). Influential models are those created by Dahlgren and Whitehead (1991; Fig. 1) and Elkeles and Mielck (1997; Fig. 2). Both models place different levels of abstraction and analysis into relation to one another. Both approaches aim to clarify the influence of macrostructures. The

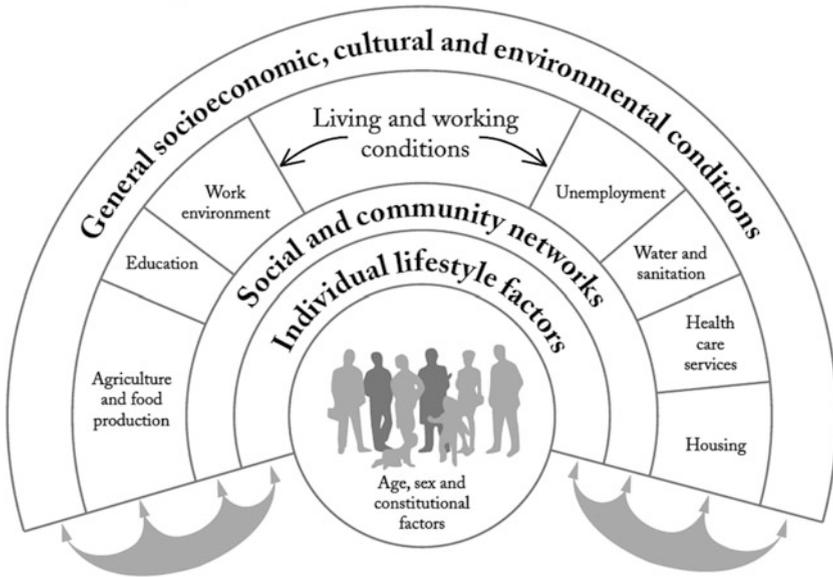


Fig. 1 Determinants of Health—Model by Dahlgren and Whitehead (1991). Source: Dahlgren & Whitehead, 2006 (first published in Dahlgren & Whitehead, 1991)

structure of social inequality consists of the micro-level, the individuals and their health status, morbidity and mortality as well as the mediators, the meso-level (e.g., education), and the macro-level (e.g., culture).

In Dahlgren and Whitehead (1991), at the social macro-level it is the general socioeconomic conditions that are important, including the economic situation and development of the respective national economy, the technical infrastructure, the legal system, and issues of peace and security. Macro-factors also include the cultural environment, which includes the political system, the media system, and the degree of availability of information, but also gender relations. The physical environment—in the form of special climatic conditions, soil quality, and abundance of raw materials—is also generally important: the state of nature.

In the model by Dahlgren and Whitehead (Fig. 1), these macro-conditions now influence the already more concrete living and working conditions of people or social groups in society. Food supply and production, education, working and living conditions, access to water, sanitary conditions, the health system, mobility, and leisure activities must be mentioned here. These living and working conditions are mediated, that is, handed down, and institutionalized by family, school, and extra-curricular socialization processes. They are reinforced or mitigated by social *and community networks*: family, friends, neighbors, colleagues, associations, and the community. *Individual lifestyles (individual lifestyle factors)*, eating and drinking habits, substance abuse, sports activities, health precautions, but also the daily

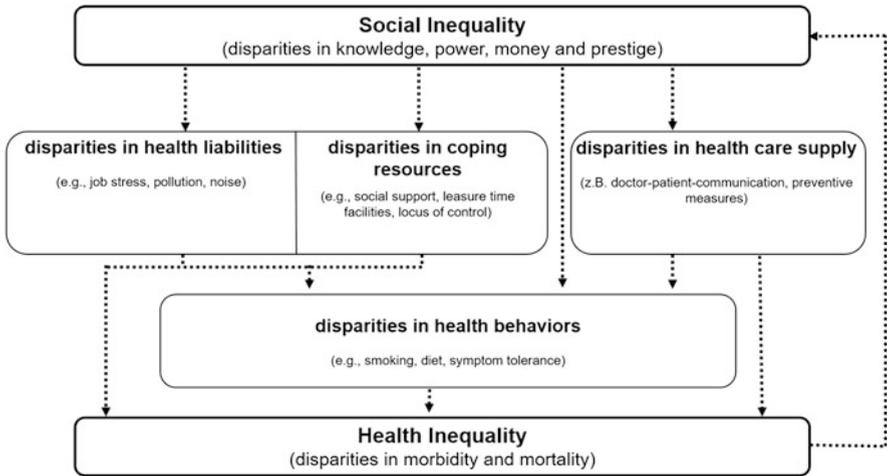


Fig. 2 Links between social and health inequalities according to Elkeles and Mielck (1997). Source: Elkeles and Mielck (1997), translated and slightly modified by the authors

rhythm of school, work, and family influence individual health, which is also determined by age, gender, and genetic make-up.

The Elkeles and Mielck (1997) model (Fig. 2) is characterized by the fact that it postulates impact paths more precisely than the model by Dahlgren and Whitehead and refers to general sociological theories of the reproduction of social inequality (see also Röding, 2018).

The model is based on the classic vertical social inequalities according to education, occupational status, and income—the socioeconomic status or position of a person or a social group in a social inequality structure (class, stratum, milieu, etc.). The connection between social inequality and health is mediated by differences in health burdens and coping resources. Examples include structural aspects such as housing and living conditions, recreational, and leisure opportunities; material aspects such as income; psychosocial aspects such as stress, social support, and locus of control; and behavioral factors such as substance use, nutrition, and physical activity (see Bartley, 2016; Mielck, 2005; Richter et al., 2009, 2012; Thurston, 2014; Vonneilich et al., 2012). The importance for explaining health inequalities has been compiled in a systematic review and shows that a large part of the inequalities can be explained by these factors (Moor et al., 2017).

Furthermore, differences in health care and health and illness behavior play an important role. The individual mechanisms are interrelated. For example, a less advantageous position in the class or stratification structure of a society can lead to differences in health burdens caused, for example, by health-promoting housing and working conditions (material/structural factors). Coping resources, such as social support, can mitigate the pathogenic effect of health burdens, but if they are less

pronounced in people with lower income or education, they also contribute to increasing health inequalities.

In both models, social relations are addressed in different ways and are considered relevant. In Dahlgren and Whitehead's model, we speak of "social and community networks"—the social networks that form our focus are explicitly and prominently mentioned, albeit as a metaphor rather than in a network analytical sense (see chapter "[Social Network Theories: An Overview](#)"). In Elkeles and Mielck's model, they appear rather implicitly, somewhat hidden in coping resources, when "social support" is mentioned as a factor that can influence, for example, health behavior and quality of life. Neither model contains an explicit network structure perspective that goes beyond this.

3 Social Networks and Health Inequalities

In the field of health research, numerous studies indicate that a network analytical perspective and a consideration of mechanisms acting in these networks (see chapter "[Social Network Mechanisms](#)") can make an important contribution to explaining various dimensions of health and health behavior (see Valente, 2010; De et al., 2007; Fletcher et al., 2011; Macdonald-Wallis et al., 2012; Seo & Huang, 2012; Smith & Christakis, 2008). With data from the Alameda County Study, for example, Berkman and Syme (1979) were able to show that socially less integrated persons have a higher mortality risk. Schwarzer and Knoll (2007) show that social support can favor coping with the consequences of heart surgery, and the studies of Christakis, Fowler, and colleagues suggest that happiness, obesity, alcohol consumption, and smoking behavior are contagious in networks (Christakis & Fowler, 2007, 2008; Fowler & Christakis, 2008; Rosenquist et al., 2010).

However, the network approach has rarely been used in connection with research into health inequalities. As DiMaggio and Garip (2012) show, this also applies to other areas of inequality research, and although it can theoretically be assumed that the mechanisms of homophily—"equal and equal likes to be together"—and transitivity—"my friend's friend is my friend"—can lead to the reproduction of social affiliations and thus reinforce social inequalities. It is also true that the network approach has not been applied to the study of health inequalities. The social status influences opportunity structures to establish contacts, for example, by enabling access to social circles (clubs, etc.) that arrange (professionally) beneficial social contacts through a higher position. Empirically, it has been shown that people with a higher status have larger networks with lower density, a lower proportion of relatives, and a greater geographical spread (Mewes, 2010; Fuhse, 2010). Granovetter (1973) has shown in his study that this network structure, in which a higher proportion of weak relationships are also found, is helpful, for example, in the search for a job. In contrast, the lack of financial resources, which is found, for example, among the unemployed, can threaten the maintenance of reciprocity (expectations) in networks, thus leading to the loss of relationships and making it

more difficult to overcome unemployment (see chapter “[Unemployment, Social Networks, and Health Inequalities](#)”).

Relatively often, studies on health inequalities include concepts closely related to the concept of social networks, such as “social relations,” “social support,” or “social capital” and discuss their possible contribution to explaining health inequalities (e.g., Kawachi & Kennedy, 1997; Vonneilich et al., 2011, 2012; Weyers et al., 2008). These approaches are often based on the idea that disadvantaged socioeconomic strata of society have higher morbidity and mortality rates because of the less access to helpful, supportive, and health-promoting social capital or social support than higher strata. Since a network theoretical and analytical perspective has proven to be profitable for research on health, disease, and mortality, and since concepts already closely related to social networks, such as social support, are also applied to research on health inequalities, we assume that a sociological network perspective can also be relevant for research on health inequalities. With this introduction and with the contributions in this volume, we propose to go beyond the aspects of social relations and social support mentioned in research or theoretical explanatory models of health inequalities by including a sociological network perspective.

Within the framework of the Scientific Network “Social Networks and Health Inequalities,” we have developed a network theoretical explanatory model for this (see Fig. 3), which we will present below.

With the network theory explanatory model of health inequalities, we can refer, in addition to the models of Dahlgren and Whitehead and of Elkeles and Mielck, to a groundbreaking model published by Berkman and Glass, in which different

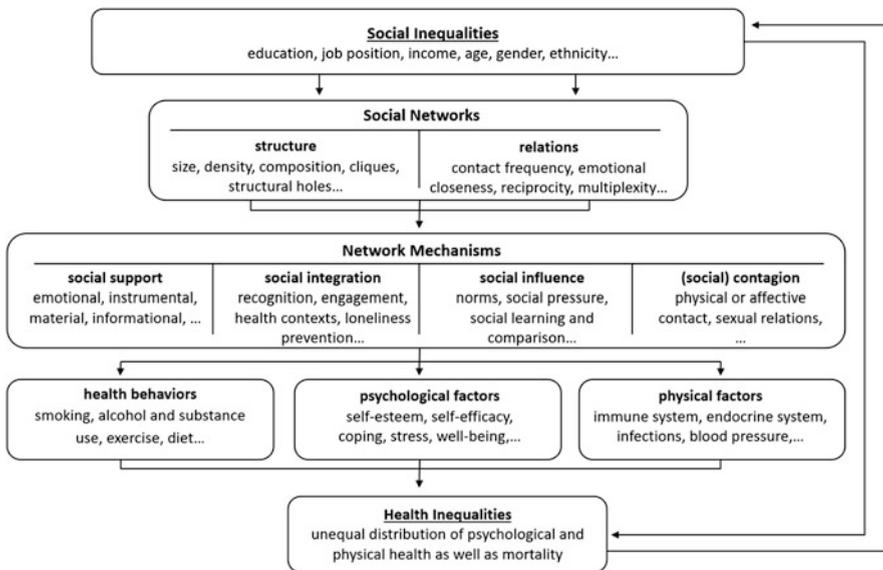


Fig. 3 A network model of health inequalities. Source: Own representation, based on: Berkman and Glass (2000), Elkeles and Mielck (1997), and Dahlgren and Whitehead (1991)

theoretical concepts of social networks, social integration, social influence, and social support and their influence on health are brought together (Berkman & Glass, 2000; see chapter “[Social Status, Social Relations, and Health](#)”). In systematizing the network mechanisms, we are guided not only by the proposal of Berkman and Glass but also by the work of Bernardi, Keim, and colleagues (Bernardi & Klärner, 2014; Keim, 2011; Keim et al., 2009). In the chapter “[Social Network Mechanisms](#)” we will go into more detail about the possibilities for action.

In our model, which explicitly takes up only a part of the theoretically possible explanation paths and interrelationships of social and health inequalities, and which are considered in more detail in the abovementioned models, we assume that inequalities at the level of education, occupational status, and income, as well as at a level of age, gender, national-ethnocultural affiliation, and so forth, have an influence on the structure and nature of relationships within the social networks in which actors and individuals are embedded. For example, numerous studies show that higher education, higher income, and a higher professional position are generally associated with larger networks, more supportive relationships, and friendships and greater social inclusion (Diewald & Lüdicke, 2007; Böhnke, 2007; Levy & Pescosolido, 2002; Stringhini et al., 2012); see chapter “[Social Status, Social Relations, and Health](#)”). Both age and gender have proven to be relevant for network structure; for example, old age is negatively associated with social inclusion (Böhnke, 2007; see chapter “[Social Networks and Health Inequalities in Old Age](#)”), and women tend to have larger networks than men (McLaughlin et al., 2010; Schwartz & Litwin, 2018; see chapter “[Gender and Health Inequalities: Social Networks in the Context of Health and Health Behavior](#)”).

We assume that these network structures and characteristics of the relationship level have an effect on individual experience and action at the micro-level via specific mechanisms. We propose to differentiate between the following network mechanisms (see chapters “[Social Relations, Social Capital, and Social Networks: A Conceptual Classification](#)” and “[Social Network Mechanisms](#)”):

- **Social support**, meaning, first of all, the general process of exchange of both tangible and intangible goods and services between related actors. Of particular importance for health and health inequalities are emotional and motivational support (e.g., comfort, understanding, encouragement, motivation); material support (e.g., money, housing); practical support (e.g., care, assistance), and informational support (e.g., tips, knowledge). Closely related to this is the concept of social capital.
- **Social integration**, which includes mechanisms and phenomena such as social recognition, isolation, and so forth, which focus on the fact that people as social beings react not only functionally (e.g., through support) but also emotionally and conatively (action-related, e.g., “social gathering”) to contact and exchange with other people and to their personal recognition (*social validation*). Social integration often (partly indirectly) initiates further important services such as access to resources or goods, contacts, or general information, which usually cannot be

conceived as direct “support services,” but which also indirectly influence the individual’s health options by influencing, for example, coping with illness.

- **Social influence**, which is to be understood as a collective term for processes that are difficult to distinguish from one another, such as social learning or social pressure, in which actors in the network influence one another consciously or unconsciously with their actions, their presence or absence, and thus also, for example, shape or influence health behavior.
- **(Social) contagion**, which refers to the direct physical or affective transmission of health-related entities through personal or intimate contacts. As a broad generic term, this refers both to contagion in the sense of the transmission of pathogens in relationship networks (e.g., through sexual contacts, syringe exchange among drug addicts, etc.) as well as the emotional effects of contagion with new behavior or knowledge content, such as enthusiasm for new health trends or problematic health behavior such as vaccination resistance.

These broadly conceived network mechanisms offer a theoretical and empirical opportunity to provide more detailed information about the three *pathways* proposed by Berkman and Glass (2000) through which social network relationships can affect health and health inequalities. These are the pathways of health behavior, psychological, and physiological mediation processes. For example, material factors, as described in the models of Dahlgren and Whitehead, as well as in Elkeles and Mielck (see Sect. 2), in the influence of environment and working conditions on health, are of course highly significant and also effective, but are not at the center of the network analytical explanatory approach.

Individual health behavior is the total of all health-promoting as well as risk behavior, that is, the individual extent of tobacco and alcohol consumption, diet, and physical activity or adherence to medical prescriptions or recommendations (Knoll et al., 2011). All four proposed network mechanisms are conceivable in principle for these behaviors or have already been linked to them (cf. Kienle & Stadler, 2012; Wills & Ainette, 2012). For example, the work of Demas et al. (2005) showed that *social integration* into a self-help group led to greater treatment adherence among HIV patients. In the work of Lee et al. (2007) on adolescents with one parent with AIDS, respondents showed less risk behavior of their own when experiencing social support, *unless there was* negative *social influence* by family members who themselves practiced risk behavior. And Salvy et al. (2009) showed in an experimental study on *social contagion* with 54 adults that physical activity with others was suitable for reducing the calorie intake in subjects.

Finally, an important path is the so-called psychological path, in which social networks affect psychological factors. Prominent examples are individual self-esteem, coping with stress, or general well-being. Schwarzer and Knoll (2007) discuss two aspects of social influences on these variables: According to the authors, social relationship networks can *enable* individuals to deal adaptively with individual stress (i.e., while maintaining a high level of function) by reducing stress or supporting them in coping with it. On the other hand, social relationship networks also provide opportunities for the individual to *make* social processes *useful* for his

or her own well-being, for example, by allowing the individual to get involved in contexts that are perceived as pleasant or to mobilize concrete services when needed (Kienle & Stadler, 2012).

The physiological pathway describes the effect of cardiovascular, neuroendocrine, and immunological mechanisms on individual health (Uchino, 2006). There has been lively research on the relationship between these mechanisms and social network mechanisms in recent decades, and it is surprising how strongly physiological measures such as heart rate, blood pressure, stress hormones, or immune cell concentrations depend on the presence and support of others. This seems to be an important mechanism, although it can probably only partly explain the relationship between networks and health (Kienle & Stadler, 2012, p. 755).

Thus, this model postulates a clear causal impact of social inequalities on health via social networks. If it is true that, depending on the social inequality dimensions of individuals or population groups, the network mechanisms are present in their relationship networks in different forms and intensities, then the three impact paths will also present themselves differently and over the long-term lead to different health statuses of the individuals or population groups. The further question is then (see chapter “[Social Status, Social Relations, and Health](#)”) whether there is an explanatory contribution of social networks to the connection between social status and health (mediator effect of social networks) or whether the connection between social networks and health varies according to social status group (moderator effect of social status). However, if we look at the current state of research and on the factors named in the model, it becomes clear that “the research gap on the influence of socio-cultural conditions on an individual’s health—mediated via network structures that Berkman et al. (2000) already lamented, appears to continue” (Kienle & Stadler, 2012, p. 750; *authors translation*). This anthology has set itself the goal of reviewing the state of research in various thematic fields and identifying the need for further research.

4 The Contributions of the Volume

With this anthology, we want to present the network perspective in more detail, both theoretically and methodologically. We would like to show the role network analysis can play for different topics in the research field of health inequalities. On the one hand, the topics encompass different biographical phases from a life course perspective, and on the other hand, they shed light on specific dimensions of inequality such as social status, gender, and migration background. Therefore, the respective chapters are similarly structured, linked, and related to each other.

The first part of this anthology deals with the theoretical and methodological foundations of network research.

In the chapter “[Social Relations, Social Capital, and Social Networks](#)”, Nico Vonneilich provides a conceptual classification of the main concepts used in this volume, thereby defining the boundaries between social relationships, social capital,

and social networks. In the chapter “[Social Network Theories](#)”, Markus Gamper presents the network theoretical foundations and important concepts from network research, beyond the already presented theories of social capital. Andreas Klärner and Holger von der Lippe take a closer look at the mechanisms of social support, social integration, social influence, and (social) contagion in social networks in an interdisciplinary overview of sociological and psychological effects in particular (see chapter “[Social Network Mechanisms](#)”). Finally, Philip Adebahr brings in the perspective of negative aspects of social relationships. This has thus far received too little attention in research on networks and health or health inequalities (see chapter “[Negative Ties and Inequalities in Health](#)”). This first part concludes with a chapter by Markus Gamper on quantitative, qualitative, and combined methods of network analysis (see chapter “[Network Analysis and Health Inequalities: A Methodological Introduction](#)”).

The second and third parts of this anthology deal with different fields of inequality research and examine the role of network analytical approaches in each field and identify research gaps.

The second part refers to a life course perspective (Bengtson & Allen, 1993; Elder et al., 2003; Mayer, 1998). This assumes, among other things, that different biographical phases (e.g., leaving the parental home, transition to parenthood, transitions to unemployment) are shaped by the dynamic interactions of the various strands of an individual biography (e.g., educational, employment, mobility, family biography), which in turn, according to our thesis, has an influence on the structure and composition of individual social networks and health inequality.

In the chapter “[Social Networks, Family Social Capital, and Child Health](#)”, Daniel Lois shows the indirect and direct impact of the child’s social network as well as the parents’ social network. Furthermore, he discusses different theoretical approaches to explain this phenomenon. Family social capital, which is fed by the network relationships, correlates positively with the socioeconomic resources of the parents in western industrialized countries. In emerging and developing countries, the existence of social support is a particularly critical factor for children’s health.

Irene Moor, Laura Hoffmann, Martin Mlinarić, and Matthias Richter deal with research on the health behavior of pupils (see chapter “[Social Networks, Health, and Health Inequalities in Youth](#)”). They show that the thesis of social influence (i.e., friends influence the [health] behavior and attitudes of adolescents and they adapt them) and the thesis of selection (i.e., adolescents choose their friends to see if they have similar attitudes and (health) behavior to themselves) can be empirically proven. However, there is still a need for research on the importance of social networks in explaining health inequalities in adolescence.

In the chapter “[Social Networks and Health Inequalities in Young and Middle Adulthood](#)”, Holger von der Lippe and Olaf Reis focus on the connections between social and health inequalities, biographical transitions, social relationship networks, and individual health behavior. According to current research, the authors believe that a media effect of social networks is probable for the influence of social inequalities on health. This is likely to be particularly evident in the context of

biographical transitions or upheavals, in which social strata succeed to varying degrees in benefiting from social networks with regard to health.

Finally, Britta Müller and Lea Ellwardt concentrate on people in the post-job phase of life in the chapter “[Social Networks and Health Inequalities in Old Age](#)”. Along three health parameters relevant in old age: mortality, dementia, and depression risk, the authors show that these parameters are associated with both socioeconomic status and social network characteristics. The mediation mechanisms of health, socioeconomic status, and social network cannot yet be adequately explained by existing studies. However, moderating effects of network characteristics on health inequalities in old age seem to be the most likely so far.

Different dimensions of inequality are then considered in the third part of the volume. Nico Vonneilich introduces the current state of research on the relationships between social status, social relations, and health in the chapter “[Social Status, Social Relations, and Health](#)”. Two questions are in focus: (1) Is there evidence for an explanatory contribution of social relations to the relationship between social status and health (mediator effect of social relations) and (2) does the connection between social relationships and health vary according to social status group (moderator effect of social status)? Thus, research suggests that social relationships can contribute to an explanation of health inequalities, whereas the current state of research on the moderating effect is less clear. One reason for this could be that a complex recording of social relationships, such as social networks, has hardly taken place to date.

Based on the empirically well-documented finding that unemployment leads to impairments of physical and mental health, Gerhard Krug, Stefan Brandt, Markus Gamper, André Knabe, and Andreas Klärner pursue two important theses on the role of social networks in this context in the chapter “[Unemployment, Social Networks, and Health Inequalities](#)”.⁴ Thesis 1 assumes that unemployment changes social networks in such a way that they no longer fulfill their positive function for health (mediator thesis). Thesis 2 states that unemployment leaves social networks unchanged and persons with resource-rich networks suffer less from health losses due to unemployment (moderator thesis). However, there is little empirical evidence on either thesis to date.

As with the unemployed, there is good empirical evidence that single parents have poorer mental and physical health than married parents. In the chapter “[Social Networks and the Health of Single Parents](#)”, Sylvia Keim-Klärner examines the relevance of social networks and their characteristics in this context. Specific network analytical studies on the health of single parents are rare, but the effect of social support is quite well-documented. A network analytical perspective also opens the view to conflictual relationships or ambivalent relationship contents and

⁴The article uses the term unemployment, which is generally used in everyday language and in science to describe the lack of gainful employment. This means that people who are engaged in work that is productive from an individual and social point of view (e.g., in the household or in volunteer work) can also be unemployed in this sense. This is explicitly not associated with any evaluative statement on non-salaried work.

directs the research interest to the interaction of supportive and stressful relationships. This is also connected to the question of how social networks of relationships can reinforce or mitigate the health effects of social inequalities.

In the chapter “[Gender and Health Inequalities: Social Networks in the Context of Health and Health Behavior](#)”, the authors Markus Gamper, Julia Seidel, Annett Kupfer, Sylvia Keim-Klärner, and Andreas Klärner refer to the well-documented health differences between the sexes (see above). Many studies also point to differences between the sexes with regard to their social networks. Women have larger networks, with a higher proportion of family members and relatives than men. However, according to more recent studies, the differences are diminishing. Women seem to take on more and more time-consuming social support tasks. They also seem to have more contact persons for problems than men. Men have more professionals who have higher positions in their networks. They connect more subgraphs and benefit more from professional relationships. As far as social support is concerned, an unequal distribution between the sexes is evident and negative sides of social capital are revealed. For example, women are exposed to greater psychological stress due to their greater social involvement. Gender differences regarding health are particularly evident in adolescence and old age. In the youth phase, the focus is on risk behavior (e.g., alcohol and cigarette consumption) and its connection with selection and influencing effects of networks. In old age, negative effects on mental and physical health are more likely to be observed, often a consequence of the networks becoming smaller, partly due to widowhood.

Stefan Zapfel, Nancy Reims, and Mathilde Niehaus state in the chapter “[Social Networks and Disability: Access to and Stabilization of Integration into the Primary Labor Market](#)” that labor market-related disability and rehabilitation research have so far largely refrained from using network theories. They note that analysis and explanatory potential in this field have by no means been exhausted. This would be important because disabilities are closely related to the genesis and stability of networks, which in turn correspond to access and continuity of employment relationships. Network contacts that are established or maintained through welfare state institutions are also important. Successful integration into the employment system depends to a large extent on the accessibility of such assistance, the commitment of welfare state actors, their cooperation, the motivation of disabled people to participate, and the individual educational background and social support.

Annett Kupfer and Markus Gamper find major research gaps in the chapter “[Migration as a Health Inequality Dimension? Natio-Ethno-Cultural Affiliation, Health, and Social Networks](#)” Ethnic and migration-related differences are increasingly being researched as determinants of health inequalities. However, the available empirical results on “migration and health or health inequalities” are partly contradictory. Studies that accept social networks as an influencing variable and thus investigate national-ethnocultural affiliation, health, *and* social networks in their interaction are very rare. This research almost always considers only one population group, while not broadening their view to include vertical dimensions of inequality such as income or education. In addition, most studies use the term network rather as a metaphor, as a synonym for group or social capital, or to exclusively investigate

social support as a central function of social networks. It remains to be asked to what extent the phenomena associated with the term “migration” are actually migration-specific—for example, linked to a concrete migration process—or whether other social group affiliations, such as class or gender, have (higher) explanatory power for health inequalities in the sense of intersectionality.

Due to the unsatisfactory state of research, the contributions in this anthology sometimes only deal with individual aspects of this model. The results from the individual areas are therefore summarized and discussed against the background of our theoretical model in the concluding fourth part of the volume, in which we identify research desiderata and provide suggestions for future research (see chapter “[Desiderata: Social Networks and Health Inequalities: Which Questions Remain Open?](#)”). In this way, as often requested (e.g., Kienle & Stadler, 2012; Govia et al., 2011), we want to enrich the theoretical debate in the field of health sciences and contribute to a more precise use of terms such as “social network,” “social integration,” and “social support.” If our anthology could set the tone for empirical studies on the influence and significance of social networks in the reproduction of health inequalities, our scientific network would have achieved its goal.

Brunswick, Berlin, Halle an der Saale, Hamburg, and Cologne, May 2022.

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Social Relations, Social Capital, and Social Networks: A Conceptual Classification



Nico Vonneilich 

Overview

- The terms social support, social capital, social cohesion, and social network are defined and delimited.
- Similarities and differences of the respective concepts are identified in order to enhance precision and understanding of the research field.
- Social networks can be described on the level of single individuals (micro) as well as on the level of groups and communities (meso-/macro-level).
- Social network theories include both quantitative aspects of social relations (structure) and qualitative aspects (function).

1 Introduction and Background

Social relations lie at the core of sociology; they are basically its framework. Without social relations, no social interactions develop. The study of social relations looks back on a long tradition of research, and this tradition is continuing in constantly differentiating and specializing subsystems. The aim of this chapter is to give a brief overview of research traditions on social relations. In particular, it aims to clarify and, where possible, differentiate between concepts that have been developed in the course of research on social relations in sociology and other related disciplines (such as social psychology). Why is a classification necessary? When dealing with research on social relations, it can be observed that different terms are used

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synonymously and that originally intended demarcations between them blur over time. This chapter addresses the following questions: What terms are used in sociological research on social relations? How are they defined? And how can an overarching concept of social networks emerge from these different terms?

The field of research on social relations is broad and is the subject of many disciplines. It ranges from sociology to social psychology, from economics to public health to epidemiology. The study of social relations has a long history in sociology. This extends from Durkheim's famous work on suicide (Durkheim, 2005 [Orig. 1897]) through Parsons' functionalist analysis of society (Parsons, 1951), which pays attention to the values and norms underlying social interactions, to Bourdieu's theories of capital and his analyses of social differentiation (Bourdieu, 2000). The conceptual diversity that emerged in the process is certainly desired and acknowledges the plurality of research activities. It ranges from social capital to social cohesion to social networks. At the same time, however, such differentiation is problematic if the terms and the concepts behind them overlap or are used synonymously without clear definitions and demarcations being associated with them (Holt-Lunstad et al., 2010; Berkman & Krishna, 2014). Berkman and Glass summarize this succinctly: "When investigators write about the impact of social relationships on health, many terms are used loosely and interchangeably, including social networks, social support, social ties and social integration" (Berkman et al., 2000, p. 137).

In the context of this chapter, social relations serve as a generic overarching term for a whole range of different concepts for describing social interaction in societies. Different characteristics can be named here. For example, the quantity and quality of social relations can be differentiated. Quantity means the number of different social contacts or the frequency of social contacts. Each social contact can be attributed to a certain quality. What are these contacts like or what resources are available through them? Social contacts are a precondition for the exchange of resources and social support. However, it cannot necessarily be assumed that an increasing number of social contacts are accompanied by an increasing availability of resources and support services. Not every person within a social structure provides access to resources.

Another potential for differentiation results from the level at which social relations can be classified. While on the *micro-level* social relations of an individual are examined, on the *meso-level* (institutional) networks of, for example, communities, municipalities, districts, or schools are studied, and accordingly on the *macro-level* countries and states. The latter is often measured on the basis of indicators for trust and norms, which will be discussed in more detail below.

Based on these basic differentiations, the following section introduces and discusses central concepts such as social support, social capital, social cohesion, and social networks.

2 Disambiguation

2.1 Social Support

The main qualitative dimension at the micro-level of social relations is social support. Social support cannot take place without social contacts and without being embedded in social networks. If the number and frequency of social contacts are measures of the quantity of social relationships, then social support is a measure of the quality of these relationships. Support research distinguishes between objective and subjective aspects of support (Turner & Marino, 1994). It has been shown that the individual perception of available support itself can have a positive impact, for example on mental health and that it does not necessarily need actually received support itself. The feeling of social support in an emergency can mitigate negative effects of acute stress without actually receiving support (Cobb, 1976; House et al., 1988; Turner & Marino, 1994; Uchino, 2009). In addition, little correlation has been found between received support and subjectively perceived support, suggesting that each can be considered a relatively independent construct (Barrera, 1986; Lakey & Cohen, 2000). This functional aspect of social relationships usually includes forms of support on emotional, instrumental, and informational levels.

Emotional support refers to those social contacts that are available for conversations about one's own feelings that can contribute to the discussion of everyday fears and worries or that can provide confirmation of sympathy and affection (Lin et al., 1999). Instrumental support comprises those forms of support that are characterized by practical help, for example, in the household, with childcare, or by borrowing money or other goods. Informational support includes all those services that provide knowledge for solving specific problems or knowledge about access to specific resources, for example, within communities. Table 1 provides a brief account of different aspects of social support, based on Wills and Shinar (2000).

An important principle of social support is *social reciprocity* (Siegrist & Wahrendorf, 2016). People expect a return for giving support (principle of reciprocity). This expectation of reciprocity enables forms of social interaction in the first place. A service in return does not necessarily have the same form as the service received, but it should be perceived as adequate and similar. If, for example, one helps in moving house (instrumental support), one can expect to receive a similar service, if necessary. If these expectations are not met, the reciprocity norm is violated and permanent social exchange is less likely. The reciprocity norm can change depending on the specific relationships. Within the family, for close friends or relatives, one is more willing to provide a service without expecting a temporal indirect corresponding consideration. Generalized reciprocity means that services that have not been provided individually are always reciprocated accordingly. Rather, a general reciprocity can be expected at a much later point in time, for example in a parent-child relationship.

The research approach to social support strongly focuses on the individual level, inquiring about forms of support that are available to individuals. Since the focus on

Table 1 Different functions of social support according to Wills and Shinar (2000)

Different functions of social support	Examples	Potential benefit
Emotional support	Discussion of feelings, talk about worries and fears, confirmation of sympathy and affection	Reduction of perceived threat of critical life events, strengthening self-confidence, improving coping strategies
Instrumental support	Availability of goods, money, tools, transport, help with childcare, household support	Contributes to solving practical problems, allows more time for recovery, supports further coping strategies
Informational support	Information about resources, proposal of alternative, and more effective strategies for action	Increases the amount of useful information available, contributes to the accessibility of necessary support, leads to more effective management
Friendship support	Partner for joint activities (sports, theater, cinema, parties, travel, etc.)	Positive affect, relief and recovery from duties and demands, positive distraction
Confirmation (feedback, social comparisons)	Offers orientation to norms and values, feedback on individual status in comparison to the respective population	Reduces subjective perception of own deviation, acceptance of own attitudes and feelings, offers the possibility of favorable comparisons (self-worth)

the individual might oversee structural aspects, it has repeatedly been suggested that the overall structure of the networks should also be examined in order to be able to work out the structural conditionality of individual support services and possibilities (Holt-Lunstad et al., 2010; Berkman & Krishna, 2014). Here, the focus is on questions of how social relationship structures must be created in order for social support to take place. Which factors within social relationships determine social support, and which ones are more likely to hinder? Can structural features of social support be identified? This is difficult to answer if the analysis focuses on individual support.

2.2 *Social Capital*

Social capital as an object of investigation can be located in various disciplines (sociology, economics, social psychology, political science). Social capital is understood as a resource that is not produced by individuals, but only through social interaction with others (Berkman & Krishna, 2014; Kawachi & Berkman, 2014). In sociology, two research traditions can be distinguished: a French research tradition represented by Bourdieu and an American tradition that includes the work of James Coleman and Robert Putnam. Both represent different views on social capital.

According to Bourdieu's capital theory, cultural capital and social capital are available in addition to economic capital. Social capital means that access to resources can be made possible through social relations (Bourdieu, 2000). Individuals can also invest specifically in these social relationships in order to gain access to social capital, which in turn can affect other forms of capital. One can imagine a "competition between investments in social capital and other capital" (Lüdicke & Diewald, 2007, p. 15, authors' translation). Social capital is seen as a characteristic of single individuals who can trade with or through it.

Coleman (1990) and Putnam understand social capital more as a characteristic of social networks, and, accordingly, the emphasis is on the interpersonal level. "Unlike other forms of capital, social capital inheres in the structure of relations between actors and among actors" (Coleman, 1990, p. 98). This North American tradition develops its understanding of social capital from the study of social networks. In the foreground is the question of how and under what conditions social capital is formed in social networks (Lin, 2000).

When looking at social capital at the micro-level of individuals, there is an overlap with both the concept of social support and social networks. Social support mostly starts from close, rather strong social relationships. The concept of social capital, on the other hand, distinguishes between strong and weak relationships. Weak social relations are more likely to provide new information and resources. This relates the concept closely to the concept of social network. It has been discussed as the concept of the *strength of weak ties* (Granovetter, 1973; Putnam, 1995). The thesis developed by Granovetter states that it is not the frequent, close, and higher-intensity relationships (also known as *bonding social capital*) that can provide relevant resources, such as access to the labor market. Rather, those resources can be made possible through contacts that are characterized by lower contact frequencies and lower intensity. These contacts, called *bridging social capital*, are differentiated by the fact that they are established across different social groups and that they increase the probability of access to certain resources (Lin et al., 1999). In contrast, closer contacts are more likely to provide instrumental and emotional support (Dahl & Malmberg-Heimonen, 2010).

Viewed at the meso- or macro-level, social capital can be determined both as a property of social groups and as a characteristic of habitats or communities. Based on the recording of individual assessments, such as reciprocity and trust in the respective living environment (e.g., neighborhood, district), social and voluntary commitment, and general attitudes toward groups or living spaces, indices are formed on an aggregate level that reflect the extent of social capital and are used accordingly as characteristics of groups or defined spaces. The basic assumption here is that only through experienced reciprocity and trust as well as on the basis of shared values and norms does regular interaction arise, which in turn enables access to resources within groups and the development of social capital (Putnam, 1995; Ichida et al., 2009; Dahl & Malmberg-Heimonen, 2010). Accordingly, the higher the level of trust in one's own living environment, the more likely it is that stable social relationship structures develop. A number of studies have confirmed such relationships (Airaksinen et al., 2015; Pickett & Pearl, 2001).

2.3 Social Cohesion

Another term that is repeatedly mentioned in the field of social relations is social cohesion. Social cohesion refers to the subjective assessments of the connections between members within social groups. Within each group, there is a certain degree of social cohesion. A distinction can be made between *structural cohesion* and *perceived cohesion*, a sense of togetherness of the individual members (Bollen & Hoyle, 1990). By emphasizing the sense of belonging, which implicitly includes shared values and norms, the concept of *perceived social cohesion* closely follows the concept of social capital.

High structural social cohesion means that the members of a particular group are closely linked to each other. Thus, the strongest cohesion within a group is achieved when each member of a network is directly connected to every other member, while low cohesion is achieved when many members of a network are only loosely and indirectly connected to each other. The subjective cohesion does not have to correspond to the structural cohesion. Social cohesion is described as a characteristic of groups or spatial areas and can therefore be assigned to the meso- and macro-perspective of social relations.

Social cohesion is often measured by subjective assessments. The focus is on individual assessments and perceptions of the respective groups as well as actual activities of individuals within groups. Strong cohesion within social groups is more often accompanied by greater social control internally, while such groups remain relatively closed to the outside world (Kawachi & Berkman, 2014). Examples of such cohesive groups can be found among immigrants who are likely to build strong ties among themselves, for example, because of language and other social barriers, but remain relatively closed to the outside world. The same applies to densely connected neighborhoods or village communities.

The concept of *perceived social cohesion* has been criticized because it has many overlaps with social capital. However, since the assessment of structures of social capitals in communities or neighborhoods is very costly and difficult to implement, perceived social cohesion can be understood as an alternative form of measurement. It gains justification from its methodological feasibility rather than its theoretical location.

Both terms, social capital and social cohesion, inherit the possibility of negative processes within social groups. These include social exclusion, stigmatization, discrimination, and other negative effects of social relationships such as ongoing conflicts (Kawachi & Berkman, 2014). In addition, groups with high social cohesion tend to have little contact with other groups. Contact between different groups can support positive attitudes toward others as well as reduce prejudice and negative attitudes. This has been studied in particular in the context of different ethnic groups (Laurence & Bentley, 2016; Hewstone, 2015) and discussed in the light of two different theories: *conflict theory* (Putnam, 2007) and *intergroup contact theory* (Brown & Hewstone, 2005). For more information on negative aspects of social relations, see the chapter on “[Negative Ties and Inequalities in Health](#)”.

2.4 Social Networks

Sociological network analysis is interested in relationships between individuals as well as in the characteristics of these relationships, but less interested in the characteristics of the individuals themselves. The basic idea is that individual actions are embedded in a network of interpersonal relationships (Burt, 1982). Furthermore, the focus is not only on the relationship between the *ego*, that is, the central actor from whom the network is viewed, and various *alteri*, that is, reference persons of the ego in the network under study. Network analysis is about examining an entire network of relationships. The relationship between the ego and the *alters* is also influenced by the relationships between the *alteri* themselves (*alter-alter-ties*), which are in turn indirectly connected to the ego. Social interaction and social processes can be explained not only by the characteristics of individuals, but also by their integration into a social environment (Light & Moody, 2020). Graphical network models are developed in order to illustrate these social relationships. From the perspective of network research, the micro-perspective of the individual is quickly abandoned. The meso-level illustrating the interdependencies of individuals and groups is of interest. An important idea in network research is that not only can an individual's position within a social network be identified, but that by revealing the structures of a network, the possibilities for contact, influence, and control within networks can be analyzed. These structures, which can be described using network theoretical concepts such as nodes, density, centrality, and position, are used to describe social phenomena (Holzer, 2009). An explanation of the different terms is given in the chapter “[Social Network Theories: An Overview](#)”. The complexity of social networks results from the various possible forms and types of interactions between individuals and groups. For example, egocentric networks focus on the relationships of a given *ego* with various *alteri*, while sociocentric or complete networks focus on all relationships between network members in a given and bounded social network (e.g., community).

In addition, social networks can be distinguished according to their respective character, which can be formal in the case of organizations and associations, or informal in the case of personal, kinship, or friendship networks and contacts. Furthermore, a differentiation according to frequency, intensity, and size and reach of the networks—the extension—is possible. Early (sociological) network research concentrated mainly on these more quantitative aspects of social relationships. Here, the concept of social networks overlaps with the concept of social integration. According to a definition by Laireiter (1993), social integration can be understood as the integration of individuals into social groups, associations, or voluntary organizations; the number of social contacts with family, relatives, and friends; and the availability of and access to social and interpersonal resources. At the same time, social integration refers to norms and values as orientation for individual actions, which are created and sustained by social interaction. Numerous indicators have been developed to measure the degree of social integration within social networks. For example, the *Social Integration Index* by Berkman or the *Social*

Connection Index by Kaplan can be cited from social epidemiological research (Berkman & Syme, 1979; Kaplan et al., 1977). More recently, network research has also increasingly attempted to expand the quantitative understanding of social networks and to include qualitative aspects in the study of social networks, for example, by considering the availability of resources or shared norms and values within networks (Henning & Kohl, 2011).

What is lacking in the sociological study of social networks to date is an independent theory (Holzer, 2009). There are links to *rational choice approaches* and to structuralist social theories. In systems theory, connections can be established to investigate social networks. In network research, formal and methodological questions are in the foreground rather than the development of a common theoretical basis. In earlier work, this lack of basic theory was also referred to as the *structural intuition of network theory* (Freeman, 2004). Network theories have found acceptance in various scientific disciplines, such as physics, biology, psychology, and sociology, but these respective approaches are not always transferable to other areas and make a common theoretical foundation difficult. So far, there are only isolated approaches that attempt to fill relational analysis with cultural and symbolic aspects on the basis of theoretical considerations in order to explain actions and interactions (White, 1995; Gibson, 2005; Fuhse, 2008). The theoretical background and methodological aspects of network research are discussed in more detail in the chapter “[Network Analysis and Health Inequalities: A Methodological Introduction](#)”.

The authors of this anthology have a common understanding of social networks. Accordingly, social networks are first of all more than the social contacts of a single individual. Social networks stand out from social integration when they allow statements to be made about the structure of social contacts, that is, illustrating the networking of the *alteri* among each other, visible through individual social contacts. Thus, such a concept of network goes beyond the understanding of networks as in the abovementioned indices (e.g., *Social Network Index*). In terms of social capital, the concept of social network is delimited in that it not only describes what resources or norms and values are available in certain groups but also focuses on how these are created and reproduced and what patterns of social networks enable or prevent certain resources. Such a network concept questions the structural conditionality of social support and can thus complement research on social support, since focusing on individual forms and patterns of support neglects the social structure behind the perceived or actual support. Social cohesion can help describe the interconnectedness of social networks.

3 Summary and Outlook

The aim of this chapter was to clarify and order the different concepts in research on social relations. Especially, in the sociology of health and the medical sociology, social capital, social networks, and social support have been established as concepts in research on social relations, sometimes independently, sometimes closely linked.

Terms in the field are defined unclearly or even used synonymously, which does not help to clarify the concepts.

Based on a conceptual clarification, a common understanding of social networks needs to be developed. A comprehensive understanding of social networks includes both quantitative and qualitative aspects of social relationships. First, social networks represent the structure within which social support and social integration can take place. By their very nature, social networks enable or prevent the emergence and spread of social capital. Social networks can be used to show the structural conditionality of social support, the degree to which individuals are in contact with each other, and the extent to which these relationships extend and how lasting they are. Qualitative aspects are also embedded: the intensity of interactions, the available resources between network members, or the norms and values and their correspondence within networks allow inferences about the quality of the networks, including aspects of social capital, such as weak ties and their ability to gain access to resources.

Likewise, networks can be measured on different levels. On a micro-level, contacts between the ego and various *alteri* can be analyzed, including the connections between the *alteri*. On a meso-level, these networks can be measured for larger groups or small-scale areas such as schools or neighborhoods. From such a perspective, conclusions about connections between networks can be drawn. The central disadvantage of such a comprehensive understanding of social networks is the methodological effort required to record social networks as described above (see chapter “[Network Analysis and Health Inequalities: A Methodological Introduction](#)”).

The aspect of measuring and surveying social networks understood in such a comprehensive way is an important aspect of the present work. Many of the previous works, especially in connection with the investigation of health inequalities, could not meet the demands of complex social networks, as they often focused on quantitative aspects of social networks (e.g., the number of contacts) or on social support without taking other members of the social networks into account. For a complex analysis of social networks, there is a lack of a common conceptual understanding and corresponding data. At this point, the present anthology aims to show what opportunities for research on health inequalities could result from a more complex understanding of social networks and where “gaps” in previous research could be expected to lead to new insights.

Reading Recommendations

Berkman, L. F., & Krishna, A. (2014). Social network epidemiology. In L. F. Berkman & I. Kawachi (Eds.), *Social epidemiology* (pp. 234–289). Oxford University Press. *Fundamental and well-founded treatment of the topic “Social Networks and Health,” both theoretical foundations and empirical correlations are presented.*

(continued)

- Light, R. & Moody, J. (2020). *The Oxford Handbook of Social Networks*. Oxford University Press. *Comprehensive introduction to social network theories and applications*.
- Kawachi, I., Berkman, L. (2014). Social Cohesion, Social Capital, and Health. In L. Berkman & I. Kawachi (Eds.), *Social Epidemiology* (290–319). Oxford: University Press. *Very thorough and detailed review of the topic “Social Capital and Health.”*

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Social Network Theories: An Overview



Markus Gamper 

Overview

- Networks are located at the meso-level. They are located between the individual (micro-level) and the institutions (macro-level).
- The theories assume an interaction between individual and their networks, with the focus on relationships and their structures.
- There is not a single network theory. Instead, there are lots of different theories or theoretical concepts.
- “Grand Theories” have an all-embracing claim to explain the connection between networks, society, and agency of individuals.
- “Middle-range theories” are research-oriented theories. They focus, e.g., on networks and their effects in specific areas like health, migration, or religion.
- “Middle-range theories” such as strong/weak tie theory are particularly important in network analysis and form the basis for hypotheses or used to interpret data.

1 Network Theories and an Attempt of Classification

Regarding network theory, John Scott argues: “[...] [T]heoretical work has long been underdeveloped in social network analysis. While the methods themselves do not require or imply any particular sociological theory, they do require theoretical contextualisation in wider debates” (Scott, 2011, p. 24). Although the theorization

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of networks has long been neglected, there has been intensive theoretical debate on the concept of social relations and their structures since the early twentieth century. It is generally assumed that people are embedded in relationships and cannot be viewed in isolation from their social environment. Individual dyads, relationships between two actors, are connected to larger units, so-called networks. Networks are located at the meso-level. They are thus a link between the micro-level, or the individual action (agency), and the macro-level, or the institutions (Weyer, 2012, p. 241). Accordingly, networks consist of actors who build relationships with one another and those relationships create overall social structures. The theoretical interest is not based on so-called classical attributes of individuals, like gender, race, or age, or characteristics of institutions, but on relationships and their structures and the embedding of the actors within a network. The starting point of research questions includes relations, the embeddedness of the individuals within a network, and the interaction between social structure and individual attributes.

Network theories can include “grand theories” and “middle-range theories.” Grand theories involve general statements and wide-ranging evidence. Those are relatively separate from real concerns of everyday life (Mills, 1968). Middle-range theories are located between global theories and research-oriented working theories. They are also restricted to a specific field of research (Merton, 1968). According, three ideal-typical forms of network research can be distinguished (Emirbayer & Goodwin, 1994). The first is structuralist determinism, which uses exclusively relational characteristics to describe the actions of actors, but it neglects cultural discourses. The actions are predestined by the structure of the networks and the embedding of the individual in these structures. Structuralist instrumentalism emphasizes the individual’s options for action, which result from his or her network position. The social actors use these options instrumentally, in the sense of structural individualism, for their own advantage (*homo oeconomicus*). Theoretical interests lie more strongly on social actors than in structural determinism. In structuralist constructivism, social structures, culture, and action are treated as separate aspects, which are linked with each other. Networks and individuals are part of culture and influence it, in turn. They stand side by side on equal footing. Relationships are understood as a component constructed by the actors themselves, which means that the perception of the participating actors is even more prominent (Emirbayer & Goodwin, 1994).

Although these three ideal types differ, they all assume that relations and the embedding of individuals influence their actions and identity. The theories also show that the actors create networks and they can be transferred to institutions and consolidated. The focus of the analysis may differ, but they all start from the human being as a social actor that is connected to others in networks. Networks can therefore be defined as “[...] a set of relevant nodes connected by one or more relations” (Marin & Wellman, 2011, p. 11).

In the next section, both examples of “grand theories” and “middle-range theories” will be presented in order to concretize the relational thinking described above. However, the focus is on “middle-range theories,” since these are of greater importance in empirical research. Furthermore, these theories are resumed in the chapter

“[Network Analysis and Health Inequalities: A Methodological Introduction](#)”. Because the theories of social capital and social support are discussed separately (see chapter “[Social Relations, Social Capital, and Social Networks](#)”) in this book, I will not examine both theories in this chapter.

1.1 Grand Theory of Network Research

Probably, one of the first theoretical discussions on networks can be found in Georg Simmel’s works (Simmel, 1950 [1908]). Although Simmel speaks of social circles, he means the relational integration into social networks. Primary social circles are social forms into which the individual is born (e.g., family and tribes). These circles are characterized by strong emotional closeness, short path distances, and high trust. On the other hand, rational circles (e.g., partnership or business contacts) are based on similar interest and on “homophily.” Actors enter into relationships which in turn affect the actions of the individuals themselves and open up or limit their possibilities. The individuality of every single person is created through affiliation with different circles. Simmel has already identified the first simple structural features that can be used in network analysis (Hollstein, 2001).

Austrian ethnologist Sigfried Nadel is another important relational thinker. He differentiates between role, relationship, and social structure. Roles are seen as network results. They are created through the interaction between actors. Roles are not exclusive characteristics of the actors themselves. Because the role templates are related to cultural norms and rules, they are more or less stable (e.g., friendships). The values of a role are described and defined, which in turn create expectations among the actors in a network. “*Thus we take ‘friendship’ to be evidenced by a variety of mutual ways of acting, perhaps visible on different occasions, such as help in economic or emotional re-responses*” (Nadel, 1957, p. 9). Role expectations must therefore always be seen in relation to other actors, as behavior is adapted by so-called role maps. “[H]e carries a role map of his society in his head, indicating the way in which his role fits in amongst others” (Nadel, 1957:58).

For the sociologist Nibert Elias (2014 [1970]), networks play an essential role in his social analysis. He speaks of figurations, meaning that individuals are dependent on one another and influence social interaction, and thus the actors themselves, too. According to him, people are, because of their basic dispositions and inclinations, “[...] directed towards and linked with each other in the most diverse way. These people make up webs of interdependence or figurations [networks] of many kinds, characterized by power balance of many sorts [...]” (Elias, 2014 [1970], p. 15). Here, the actors are relatively autonomous (*homines aperti*), but from birth they are networked with others in constellations of power and dependencies (Elias, 2014 [1970], p. 169).

An important researcher in the current theoretical debate is the physicist and sociologist Harrison White (1992, 2012). With the help of relational thinking, he tries to explain how actors develop their own individual identity. According to

White, social identities are not given as irrevocable facts, but they are constructed in social networks and formed from control. They are not given; rather, they are negotiated in relation to other actors in a certain network. Identities can only be stable if others recognize them. Therefore, actors put themselves in relation to others and try to construct and stabilize their identities. These structures are dynamic and consist of so-called stories—shared pasts or exchanged experiences that actors tell about and share with each other (White, 1992).

This brief introduction of grand theories is intended to be an overview, but it shows different ways of thinking and gives insight into how networks and society can be considered. But they have the idea in common that relations are the origin of action or are influenced by action, and networks have a universal claim to explanation. For those who are interested in this kind of theories like “Relational Science” or “Relational Sociology,” I recommend the works of Crossley (2010), Dépelteau (2018), or Emirbayer (1997). These provide a broad overview of the debate.

1.2 *Middle-Range Network Theories*

Besides the grand theories, there are also middle-range theories, which put the focus on relations and social networks. These explanatory theories are more empirical-based, and in some cases, they can be subsumed under grand theories. Middle-range theories can be helpful for the development of hypotheses, but also for the interpretation and description of research results. I would like to present some of those theories in this chapter. I have chosen concepts that are empirically implemented in many studies and therefore, in my opinion, are very important for empirical procedures. This is not an exhaustive list of concepts, but it provides an insightful look into conceptual approaches of network research. This chapter takes account of theoretical approaches such as strong and weak ties, structural holes, homophily, popularity, reciprocity, balance theory, and cliques.

1.2.1 **Strong/Weak Ties**

A very important relational concept goes back to Granovetter (1973). In his approach, the sociologist distinguishes between two types of relationships by their intensity: *strong* and *weak* relationships (*ties*). The differentiation between strong and weak relationships is therefore “(probably linear) combination of the amount of time, the emotional intensity, the intimacy (mutual confiding) and the reciprocal services [...]” (Granovetter, 1973, p. 1361). Strong relations are characterized by, for example, reciprocity, high contact intensity, high intimacy and emotion, and trust. This includes, for example, family members or even good friends. On the other hand, weak ties are loose relationships with, for example, low contact frequency and low intimacy. Examples are holiday acquaintances, colleagues, and loose acquaintances. While strong relationships are important for aspects such as emotional support,

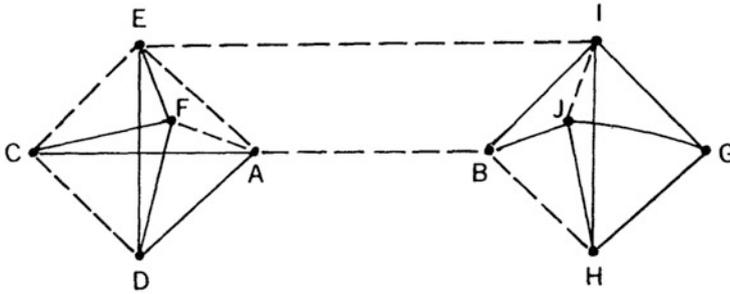


Fig. 1 Importance of weak ties according to Granovetter. Source: Strong relations are the black solid lines. Weak ties are dashed lines. These connect the subgraphs with each other (Granovetter, 1973, p. 1365)

Granovetter was able to show that weak relationships have their very own benefits. They provide access to new information and resources that are not part of the tight social environment, because, different to strong ties, weak relationships build bridges to other subgraphs with, e.g., different social or political orientations (see Fig. 1). Weak relationships reduce path distances and enable us to get in contact with actors who have information that our close environment does not provide. In his study “Getting a Job,” Granovetter (1974) was able to prove by looking for a job in the engineering sector that weak relationships promise success. These are even more important than traditional application procedures, he argued. Granovetter’s idea of strong and weak relationships also finds its way into health research, where it is assumed that different types of relationships have different consequences on health behavior or even subjective well-being. To consider differences in relationship strengths in research, empirically (qualitatively as well as quantitatively), the concept and the distinction have to be considered and defined from the very beginning. Examples include studies on the impact of weak relationships and the diffusion of suicidal thoughts (Baller & Richardson, 2009) or the mediating role of strong or weak relationships between poverty, health, and well-being (Cattell, 2001). A precise distinction between the two types of relationships is often ambiguous and may also differ from context to context. Therefore, it is important to clearly identify and justify parameters for the distinction.

1.2.2 Structural Holes

Burt (1992) also deals with types of relationships and their various effects. While Granovetter focuses more on the intensity of the relationship, Burt (2004) considers the structure and thus the position of an actor in the network to be of essential importance: “[...] people have an advantage because of their location in a social structure” (Burt, 2004, p. 351). He thus addresses the structural embedding of the actors and the resulting possibilities and restrictions for action. Structural holes are missing relationships that separate two or more subgraphs (see Fig. 2). These holes

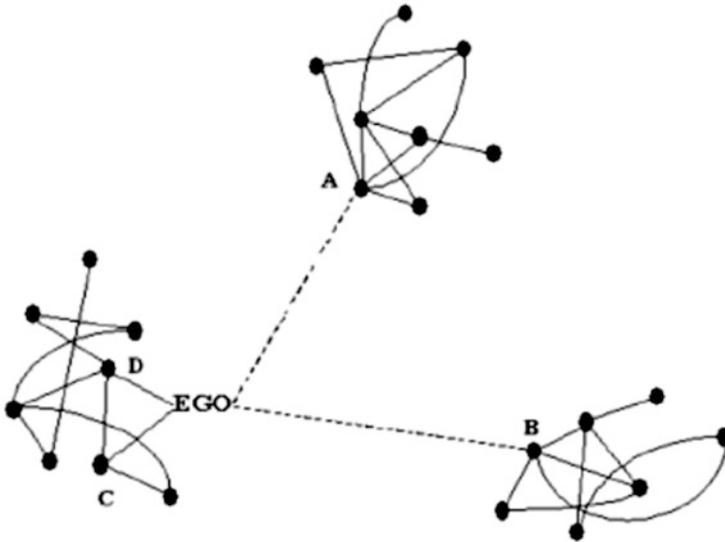


Fig. 2 Structural holes and bridging. Source: Ego sits between three subgraphs and connects them. It can take advantage due to its network position (Burt, 1992, p. 27)

prevent the transfer of information or other resources, for example. Actors who bridge such holes by connecting subgraphs and acting as a bridge can have advantages because of their structural location within a network. For example, the actor has insight views into very different subgraphs, which allows them to generate non-redundant information or to merge knowledge from different social groups. In their so-called broker position, they can control the flow of information between different subgraphs (e.g., *tertius gaudens*¹). For example, they can decide which information they want to pass on, when, and how.

This theory is rarely found in health research. One example is the egocentric study by Cornwell (2009). The author explores the extent to which the state of health affects the bridging of such structural holes. Cornwell argues that the existence and use of bridges in personal networks also depend on an individuals' health. Poor health makes it more difficult to withstand the pressures and to execute some of the common tasks associated with bridging structural holes. Cognitive health and functional health are quite positively associated with bridging structural holes. The study by Schafer (2013), "Structural advantages of good health in old age," addresses a similar question and supports Cornwell's results (2009). The study of Goldman and Cornwell (2015) examined the possibility that complementary alternative medicine (CAM) usage in later life is correlated to social network structure. The authors emphasize the importance of structural holes: "*Specifically, we find support for the argument that individuals who function as bridges between their*

¹This refers to the laughing third party.

social network members are significantly more likely to use alternative medicine, net of a number of other predictors of CAM usage and network bridging. This result suggests that bridging potential may be an important structural feature of networks that shapes alternative medicine use.” (Goldman & Cornwell, 2015, p. 76).

1.2.3 Homophily (Influence/Selection)

Homophily is an important concept in network research. The term as we know it today was coined by Lazarsfeld and Merton (1954), who combined observations of classical network studies with ethnological research on marriage formation. In simple terms, this means “birds of a feather flock together.” Here, the two authors distinguish between “status homophily” and “value homophily.” The former refers to attributed characteristics such as ethnicity, gender, religion, and education. “Value homophily” also refers to persons who have similar attitudes or ways of thinking, irrespective of the status of the respective person. In terms of networks, this means that people build relationships with others who are similar to them (Lazarsfeld & Merton, 1954). McPherson et al. (2001) note that ethnicity, age, religious affiliation, education, gender, and occupation are particularly important factors within networks: “*Homophily in race and ethnicity creates the strongest divides in our personal environments, with age, religion, education, occupation, and gender following in roughly that order*” (McPherson et al., 2001, p. 415). Two different processes can explain how homophily is produced in networks. On the one hand, this occurs through selection processes. Here, the actors, who are similar to each other, select each other because they share the same attributes. On the other hand, actors who differ in one or more attributes adapt to the behavior of each other. In other words, they influence each other over time (Knecht, 2008). Even if the results are similar, the processes are different. In order to be able to distinguish between these two effects empirically, two measuring time slots are needed. In health research, for example, the extent to which young people (see chapter “[Social Networks, Health, and Health Inequalities in Youth](#)”) influence their smoking, drinking, or cannabis consumption behavior or join different social networks selectively is being investigated (Knecht, 2008; Mercken et al., 2009; Pearson et al., 2006). On the other hand, there are studies, most of them being non-longitudinal studies, which examine the health behavior of older people (Flatt et al., 2012) or depressive people (Schaefer et al., 2011). Compared to theories that were already presented, this concept seems to already have found its way into health research, especially research on young people, teenagers, and adolescents.

1.2.4 Popularity: Attributes Popularity and Preferential Attachment

There is also the concept of “popularity.” In this middle-range theory, some actors “own” more relationships than others and are therefore more popular than other actors within the network. Here, I would like to distinguish two approaches. One

concept assumes that certain attributes (e.g., age, gender, and health) affect the popularity of actors. People are popular because they are, for example, rich or considered beautiful. Another idea based on degrees of relation assumes that actors who already “own” many relationships may receive even more relationship requests because of them. Popular persons are those with whom many actors want to build a relationship. Initial research has shown that intelligent, extroverted, and capable students are more famous or popular than others (Bonney, 1946; Young & Cooper, 1944). Against the background of health, questions such as how popularity influences health (e.g., health-related behavior such as smoking) or how certain diseases influence popularity arise. Valente et al. (2005), for example, point out that particularly popular students start smoking. “*Popular middle school students were more likely to become smokers compared to their less popular peers*” (Valente et al., 2005, p. 323). These concepts can especially be found in research on pupils or students and their health behavior. *Preferential attachment* also assumes that relationships within a network are unequally distributed. The focus is based on relationships, that is, actors who already unite many relationships can get relationships even more easily. Merton (1968) describes this as the “Matthew effect.” De Solla Price (1976), for example, was able to point out this phenomenon on the basis of citations in articles (“cumulative advantage”) and Barabási and Albert (1999) for social and social–technological networks (film actors, electricity network, Internet) (“scale-free”). While popularity based on attributes has found its way into health research, preferential attachment does not yet play an important role.

1.2.5 Reciprocity

An important principle in network research is reciprocity. Reciprocity assumes that people expect a gift or action to be returned or balanced. This is where the principle of gift and gift in return (Mauss, 1954) as well as the networks that arise from this process come into play. The different expectations of gifts and gifts in return make many forms of social interaction and networks possible. For Simmel (1950 [1908]), it is generally a basic principle of societies, in general. Transactions between the actors are not always linked to an official price, calculated in money, or to formal (e.g., law) rules. A service or gift in return does not have to be exactly the same or paid in the same form as the received service or gift, but it should be at least perceived as adequate and similar. For example, if you help friends move to another home, you can expect to receive a similar service at a later point in time. If the giver’s expectations are not fulfilled, then the reciprocity norm is violated and social exchange in the future becomes less likely. Reciprocity norms depend on culture, historical aspects, and the role of the actors involved (e.g., friend and acquaintance). For example, within the family in so-called Western countries, close friends or relatives are more willing to provide a service without expecting a direct temporal consideration (Sahlins, 1974). As a rule, a right (e.g., contract law) does not exist. The structure of an exchange network can be illustrated by quantitative network research very well. Obligation norms and exchange practices are rather open to

qualitative research (see chapter “[Network Analysis and Health Inequalities: A Methodological Introduction](#)”). For example, the qualitative study by Wentowski (1981), “Reciprocity and the Coping Strategies of Older People: Cultural Dimensions of Network Building,” explores (1) how cultural rules govern the exchange of support within networks and (2) how differences, in the way older people experience these rules in creating support over time, are interpreted. The research also shows the great personal importance of reciprocity for maintaining the psychological self-esteem of older people. Nevertheless, Abbott and Freeth (2008) point out that the theoretical model of reciprocity is hardly taken into account in health research.

1.2.6 Balance Theory

Heider’s balance theory has had a great impact on social network theory. The psychological theory goes back to the equilibrium theory mainly, which can be attributed to the consistency theory.² According to this theory, actors try to shape attitudes and convictions without contradictions (Witten, 1989). Against this background, the theory of equilibrium deals with contradictions of relationship structures between actors or between actors and other elements (Heider, 1958). It is assumed that actors strive for a balance. The state of equilibrium is a situation in which the relations between the variables fit harmoniously; there is no urge for change. Statements on effects on relationships can be derived from the Balance Theory developed by Heider (1958). The psychologist assumed the following constellation:

1. There are a person P, a person O, and a situation, an event, an idea, or a thing (X).
2. There are positive and negative relationships.
3. Individuals strive to achieve a state of balance.

While Heider focuses on the cognitive structures between the three units, Cartwright and Harary (1956) extend the balance theory to the level of socio-structural characteristics. This step made it possible to extend the concept of balance to networks and groups. When is a triad balanced, in the sense of a network? It is balanced when all relationships are positive or when two relationships are negative and one is positive. For example, let us assume that person A has a friendship with person B. At the same time, person B is in a negative relationship with person C. The triad would be balanced if person A is also in conflict with person C. In other words, the enemy of my friend is my enemy. An imbalance exists when one relationship is negative and two relationships are positive. The different constellations are shown again in Fig. 3.

The study by Cornwell (2009) points out that poor health can have an impact on the ego–age–age relationship system. However, which relationships can and cannot be bridged in triads still need to be further researched.

²Consistency Theory assumes that harmonies in cognitive processes—such as perception, attitudes—have a positive effect on the individual.

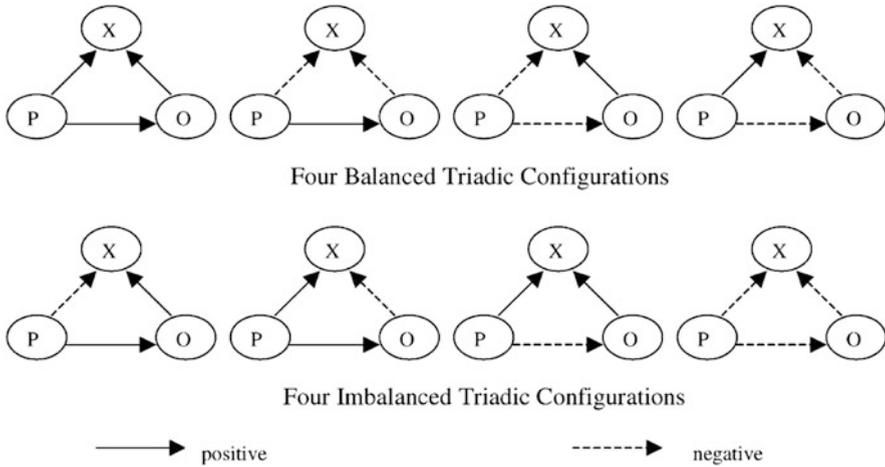


Fig. 3 Unbalanced and balanced triads. Source: Unbalanced and balanced triads. P is a focal person, O is another actor, and X is an object or a person. (Hummon & Doreian, 2003, p. 19)

1.2.7 Small Groups: The Clique Theory

Small group research has an established and important position in network research. A small group can be described as a small number of actors who can get in contact with each other (Homans, 1950). Within these small groups, social mechanisms can be explored more easily. The clique is one of these small group concepts. In everyday language, the term clique generally refers to a group of individuals who are in relatively close, direct, and reciprocal relationships. The common purpose that the group members of a clique pursue can be very different: a street gang, friends in school, or a coffee party (Täube, 2010, p. 397).

In network research, cliques are an aggregation of actors in a large network. They are densely connected actors who form a small group. These subgroups are not only highly connected but show other characteristics, like high activity, solidarity, and group identification (see chapter “[Network Analysis and Health Inequalities: A Methodological Introduction](#)”). Against this background, a clique can be defined as a complete subgraph of at least three actors in which every possible pair of points is directly connected by a relation and the clique is not contained in any other clique (Wasserman & Faust, 1997, p. 254). With regard to involvement in a clique and health, the study by Ennett and Bauman (1993) shows that students who are involved in cliques do not smoke as often as isolated participants. As far as mental health is concerned, Provan and Sebastian (1998) point out that involvement in entire networks tends to have a negative effect, while involvement in cliques, which also overlap, can have a more positive effect.

This chapter aims to show that there are network theories, besides the so-called grand theories, that have a strong empirical connection and can be very useful for network analysis. In my opinion, it is important to consider theories that help answer

the research question before the data is collected. The theories can help to concretize research questions or operationalizations. In the absence of theoretical references, empirical analysis can often be difficult. Since many theories do not arise from health research, theories must be transferred (e.g., strong/weak ties).

2 Social Networks and Theory: A Conclusion

In this chapter, I differ between “grand theory” and “middle-range theory” of network research. What all theories have in common is that, in addition to attributes such as age and gender, they focus on the embeddedness of individuals in their social environment. Networks are located between individual action (micro-level) and structuralism of institution (macro-level), at the so-called meso-level. However, there is not one sole network theory. In general, three different orientations can be distinguished: structuralist determinism, structuralist instrumentalism, and structuralist constructivism (Emirbayer & Goodwin, 1994). Emirbayer and Goodwin distinguish between how relations are used to understand social phenomena.

While the “grand theories” claim to have wide-ranging evidence with a universal claim to explanation, nowadays they move more into the sociological spotlight, but they play a subordinate role in the empirical implementation. Middle-range theories are limited to a specific field of research and are more research-oriented. These include, for example, strong/weak tie theory, the theory of structural holes, triad theory, balance theory, the theory of homophily, clique theory, or even reciprocity. These theories help to better explain or understand the formation of networks, their effects, or their significance for the actors. They also serve as a basis for forming hypotheses. Exactly which theories could be relevant for one’s own research cannot be clarified here; however, this list is intended to help you gain an overview so that you can select theories for your own research.

Reading Recommendations

- McPherson, M., Smith-Lovin, L., & Cook, J. M. (2001). Birds of a feather: Homophily in social networks. *Annual review of sociology*, 27(1), 415–444. *An English article on homophily that gives a good overview of the topic.*
- White, H. C. (2008). *Identity and control: How social formations emerge (second edition)*. Princeton University Press. *Probably one of the most current and exciting theoretical works on networks.*
- Emirbayer, M. (1997). Manifesto for a relational sociology. *American journal of sociology*, 103(2), 281–317. *An English article that explores the significance of relational thinking and ideas in sociology.*

(continued)

- Burt, R. S. (2004). Structural holes and good ideas. *American Journal of Sociology*, 110, 349–399. *An article that uses data from organizational sociology to describe the idea of structural holes with good ideas explained very well with an empirical example.*
- Granovetter, M. S. (1973). The strength of weak ties. *The American Journal of Sociology*, 78, 1360–1380. *Probably the most famous article on weak relations and their value.*

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Social Network Mechanisms



Andreas Klärner  and Holger von der Lippe 

Overview

- Social relationship networks are not standard constructs in either sociology or psychology. The development of theories about their effects on health is still in its infancy.
- We present some central theoretical concepts, as well as empirical results, on network effects under the headings of “social support,” “social integration,” “social influence,” and “social contagion.”
- Recent work increasingly finds or emphasizes that a simple notion of social relationship effects on health (such as “a lot of support or large networks help a lot”) is probably not very realistic.
- Instead, current studies try to show a picture of network effects that is as differentiated as possible. For this purpose, the minimum requirement is the differentiation of (1) direct vs. indirect and (2) positive vs. negative health effects by (3) different actors or sectors of the network.
- So far, there is little consolidated evidence on this more differentiated consideration of network effects on health, and thus, additional research efforts are necessary.

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1 Introduction

The influence and significance of social networks in health research are becoming widely discussed (Cornwell & Hoagland, 2015; Pescosolido & Levy, 2002; Smith & Christakis, 2008; Valente, 2010, 2015). Sociological network research meets the demand for a stronger consideration of “contexts” or the “environment” that influences health and care (see Pescosolido, 2006). Social networks are conceived as a mediating meso-level, which mediates between social macro-structures (e.g., healthcare systems, institutions, and organizations) and individual (not always) rationally acting actors (cf. Berkman & Glass, 2000 and chapter “[Social Networks and Health Inequalities: A New Perspective for Research](#)”). This perspective offers the possibility to analyze a *variety of psychosocial mechanisms*. These mechanisms can influence individual health in different ways, including (health) behavior, psyche, or physiology.

Neither in general sociological and psychological network theory (e.g., Agneessens & Wittek, 2008; Antonucci et al., 2010; Borgatti & Foster, 2003; Erickson, 1988; Friedkin, 2001; Marsden & Friedkin, 1993; Westaby, 2012), nor in the field of research on social network influences on health (e.g., Berkman & Glass, 2000; Martin & DiMatteo, 2017), there is an agreement on which *specific mechanisms* should be distinguished and taken into consideration (for a similar dilemma in the area of fertility research, see Bernardi & Klärner, 2014). From this point of view, the following attempt to distinguish between different mechanisms—social support, social integration, social influence, and (social) contagion—should be understood as a proposal to systematize different mechanisms discussed in the literature.

2 Support, Integration, Influence, and Contagion

The following network mechanisms are distinguished in the network model of health inequalities presented in the introduction to this volume (see chapter “[Social Networks and Health Inequalities: A New Perspective for Research](#)”). These mechanisms are presented on the basis of various theoretical approaches and models of the influence of social relationships and social networks on health behavior and the mental and physical factors influencing health. They are social support, social integration, social influence, and social contagion.

According to the current state of research, these terms can be understood as *collective terms* that describe a whole range of other subtypes and partial aspects of social network mechanisms (see the following subsections). We pursue this conceptually open and overview-oriented approach to possible network mechanisms on health in this chapter because networks cannot simply be described as a sociological or psychological standard construct (such as *communities*, organizational teams, informal groups, or families). They lack well-established concepts but have their own logic and dynamics, which are not yet fully understood either theoretically or

empirically. In order to elaborate on the context of these terms, we are guided by the current overviews in Harkins et al. (2017).

2.1 Social Support

Social support is a generic term that refers to the general process of exchange of both tangible and intangible goods and services between related actors. The concept of social support is central to various sociological theories dealing with “social capital” (e.g., Bourdieu, 1986; Coleman, 1988; Lin, 1999). For a more precise definition, see chapter “[Social Relations, Social Capital, and Social Networks: A Conceptual Classification](#)”.

The positive aspects of social support have so far been particularly highlighted in the field of health research. Thus, numerous studies, which now also include meta-analyses (e.g., Barth et al., 2010; Röhrle & Strouse, 2009; Shor et al., 2013), show that the presence and use of social support increase well-being, reduce the probability of clinical diagnoses, and have a positive influence on coping with diseases (cf. Schwarzer & Knoll, 2007; Uchino, 2006). In a study by Kouvonen et al. (2012), for example, emotional support in the network is correlated with the maintenance of health-promoting leisure activities.

Currently, to our best knowledge, there is no research that looks at social networks in the narrower sense, that is, considering the relationships between the network partners and links between social and health inequalities. However, Vonneilich et al. (2012) found indications that social relationships contribute to the explanation of health inequalities. According to this, people in lower-status groups benefit, especially from social contacts and social support. This can have a positive long-term impact on health. Social support helps to cushion the negative health aspects of low socioeconomic status.

Apart from the positive effects of social support on health and the negative effects in the absence of support, the theoretically presumed negative influence of given and received social support has so far received almost no attention (see chapter “[Negative Ties and Inequalities in Health](#)”). On the one hand, giving support to network partners can increase one’s own well-being, as social recognition and respect are a consequence of the support provided. Since exchange processes are usually based on reciprocity, giving support also increases the chance of getting support back in the future. On the other hand, giving support can also put a strain on one’s own resources (financial, temporal, psychological, etc.). Such stress can be detrimental to one’s own health. This is particularly important in close social relationships such as with children, with one’s own parents, or with one’s partner (Laireiter & Lettner, 1993).

While both social capital and support theory assume that the *extent of* social support is crucial for health effects, some studies point out that not all findings show equally strong effects. Thus, the supposed clarity may need closer examination, especially with regard to the composition and structure of support networks. For

example, the study by DiNicola et al. (2013), based on a survey of more than¹ 400 COPD patients, found that a high level of practical support that was received through the network even engendered higher anxiety in the patients. However, it seems important to know *from which concrete sources* such support comes and also *what specific form of support* is provided. For example, Huxhold et al. (2010) with data from the representative German Ageing Survey (DEAS) found that, as expected, the instrumental support received from *friends* or *acquaintances* increases subjective well-being among older people, whereas the same form of support reduces well-being when it is provided by *relatives*. For other forms of social support, this does not seem to apply in the same way. For example, Primomo et al. (1990) found, on the basis of a study of 125 depressed women, that emotional support (*affirmation*) provided by family members has a positive effect on recovery, but the same support provided by friends has no effect.

Overall, there is apparently a need for more differentiated studies, for example, network analytical support studies, in order to be able to name the different mechanisms of action more clearly. In contrast to the positive correlation between support and health, Gleason and Iida (2015) recently concluded in a relevant overview that support services, if observed in practice, can have negative or no effects on health measures more frequently than previously assumed—for example, if the recipient considers himself or herself dependent or feels compelled to provide something in return. Thus, the authors conclude with numerous necessary improvements in current support research, such as a clearer distinction between beneficial and harmful and between direct (e.g., emotional and instrumental) and indirect (e.g., intentional withdrawal and disregard for support wishes) support. In our view, the differentiation of different sources of support by actors or sectors in networks also appears to be an important further addition.

2.2 *Social Integration*

The mechanisms subsumed under the concept of social integration (cohesion) focus on the fact that people, as social beings, react not only functionally (e.g., through support or direct pressure from others) but also emotionally and conatively (action-related, e.g. “social gathering”) in order to contact and exchange with other people and to gain their recognition (*social validation*). For a more precise definition, see chapter “[Social Relations, Social Capital, and Social Networks: A Conceptual Classification](#)”.

Social recognition by other network partners (these can be individuals, but also institutions), or involvement in groups and the expression of appreciation for one’s own person can have a considerable positive influence on self-confidence and thus on well-being. In the event of the absence or failure of this appreciation, or more

¹COPD means “chronic obstructive pulmonary disease,” i.e., a chronic lung disease caused by narrowing of the airways. This disease does not completely disappear even after treatment.

generally, a lack of social integration, negative consequences for self-esteem can arise, which can lead, among other things, to depressive symptoms (Okamoto et al., 2011).

A classic field of investigation on this topic can be identified in loneliness and social isolation research (e.g., Elbing, 1991). Even the early studies by Berkman and Syme (1979) were able to demonstrate higher mortality among socially less integrated persons. But from a network perspective, the concept of integration goes well beyond the “quantity” of social relationships, because a connection between network position (central/marginal/isolated) and behavior can also be shown. For example, socially isolated persons are more likely to smoke (Seo & Huang, 2012). One of the few studies dealing with the relationship between networks, social inequalities, and health found that homophilia, that is, contact with socially similar persons, increases with socioeconomic status and slightly reduces smoking (Lorant et al., 2017). Kawachi and Berkman (2001) report an initially paradoxical effect, according to which a higher number of relationships are associated with an increase in symptoms of mental illness. They find this to be the case for women with limited socioeconomic resources and especially when these relationships are linked to the social obligation to provide support for others themselves.

Social integration in kinship and friendship networks or in (semi-)institutional contexts such as volunteering and civic engagement can have a buffer effect, like social support, and alleviate stress, feelings of isolation, and so forth. In the area of research on negative health effects of long-term unemployment, it has been shown that the lack of social integration and social isolation is associated with depression and health-damaging behavior. On the other hand, integration in social contexts is associated with positive health effects (see Gore, 1978; Schwarzer et al., 1994; Avison, 2001): Social engagement and an active social network contribute to a sense of belonging, which in turn can lead to an improved ability to deal with the consequences of mental illness (Argentzell et al., 2012).

This raises the question of *why* social embedding can actually have these positive effects. Two socio-psychological mechanisms have been formulated in the relevant literature: *social facilitation* and *social inhibition* (McCarty & Karau, 2017). Both describe the phenomenon that the probability of individual (health) behavior can be increased (*facilitation*) or reduced (*inhibition*) by the presence of others. In the health context, this network effect can be observed more frequently, for example, when individually desired but costly behavior (e.g., healthy diet and regular sport) becomes more likely if it is undertaken together with others. Conversely, individually undesirable but probable behavior can be reduced by the presence of others, for example, when the smoker abstains from consumption in the presence of non-smokers and the alcohol consumer controls his consumption in the presence of others. Here, a proximity to the concepts of social influence is evident—the important difference being that the mechanisms of social integration do not examine direct effects on health, but rather the incidental and indirect consequences of integration or sociability.

Another mechanism discussed in social contexts may be the so-called *groupthink* (McCarty & Karau, 2017). This refers to the effect that usually occurs in closely

linked network segments (e.g., cliques, and families) when, over time, certain information or attitudes regarding a questionable behavioral option are formed between all participants with insufficient consideration of their risks. In the school context, this has been studied in *peer groups*. *Groupthink* describes school friends, for example, who, as they spend more and more time together, come to the shared conclusion that the risks of consuming illegal substances are generally overemphasized and that it is therefore worth giving it a try. For instance, in a given clique each individual has differing opinions on a specific topic, but then, over a period of time, they all gradually come to adopt the group consensus. That change would be an example of a groupthink effect, which could have positive or negative effects on individual health.

2.3 *Social Influence (Learning, Pressure, Comparison Processes)*

Social influence is a collective term for processes that are difficult to differentiate from one another, in which actors in the network consciously or unconsciously influence one another with their actions, presence, or absence. Social learning and *social pressure* (also *norm enforcement* or *injunctive norms*) as well as *social compliance* (i.e., the individual willingness to comply with social influences, also *norm adherence*) as possible network mechanisms will be discussed below.

Social learning—the process of adopting, exchanging, or jointly evaluating information and observed actions—is an important mechanism in the field of social influences in a network. Social learning is a concept that is firmly established in social psychology (cf. e.g., Miller & John Dollard, 1941; Bandura, 1962) and can, for example, consist of the adoption of a certain health-related behavior (e.g., trampoline jumping, cycling, and smoking) by other network partners. The assumption is that individuals observe the actions and behavior of others and learn from their experiences. The more often a health-related behavior occurs in the network, the higher is the probability for the individual to observe it and try it out for himself. The term “descriptive norm” describes the result of such an observation: “*Descriptive norms are theorized to describe what most people do in a given situation*” (Guadagno, 2017, p. 119) For example, a study with 2643 individual observations of staircase vs. elevator use by American students in a three-story university building showed that, by putting up a sign indicating the positive health effects of climbing stairs, elevator use slightly reduced from 15.1% to 13.3% (Burger & Shelton, 2011). The same sign in the control conditions indicating that “over 90% of all people here use the stairs” had a significantly stronger effect, namely a reduction from 15.3% to 8.2%.

Individuals can accept or reject (consciously or unconsciously) observed behavior and action models from others, or they can see the consequences of various actions in the “model.” Social learning leads to individual behavioral change when

observations, information transfer, and/or discussions within a network change the views of individuals about the feasibility and consequences of certain actions and thus their own attitudes and intentions or intentions for action. In the area of behavioral innovations, for example, the consequences of a new “health trend,” individuals are receptive (*susceptible*, Nezlek & Smith, 2017), reticent, or hostile in different ways and intensities, depending on their social position in the network and their personality (cf. Rogers, 2003).

From a network perspective, social learning is dependent on the nature of relationships and the relationship structure in a network. Numerous studies in the field of diffusion of information, as well as technical and social innovations, have shown that especially weak relationships and less dense networks or parts of networks have a special importance in the *diffusion of* new information or innovations (*diffusion of innovation*, e.g., Granovetter, 1974; Rogers, 2003).

Social pressure (sometimes also: *norm enforcement* or *injunctive norms*, see Nolan, 2017) is a term established in sociology and social psychology that describes the process of directly inducing individual actors to act in conformity with the social norms accepted in a reference group through social interaction. This process is undergone, for example, in order to gain recognition in the group or to avoid conflicts with their *peers* (compare the classic works of Festinger et al., 1950 and Asch, 1955). Social norms can apply across cultures, be specific to certain cultures or institutions/organizations, be formulated more or less explicitly, and be accepted to a higher or lower degree. Norms can change over time, such as the expectations linked to certain gender roles (cf. Popitz, 2006). The chance of deviating from norms (and for innovations) is lower in highly interconnected, particularly dense and manageable networks because they are shared by socially similar actors and because sanction mechanisms can be more easily used to demand norm-compliant behavior.

The influence of social pressure is effective in terms of health behavior and can have both positive and negative effects by aiming to maintain or discontinue behavior that is harmful or beneficial to health. The effect of social pressure depends on the structure of the network. In addition, the assessment of the pressure by the actors and the question of retreat, avoidance, or avoidance options play a role (Taylor, 2015).

Social pressure, which has a health-promoting effect, can consist of network partners (e.g., spouses) making sure that people close to them in the network take physical symptoms seriously and see a doctor. Pressure that promotes unhealthy behavior can be exerted by groups of friends and peers, for example, by mocking abstinence from alcohol and other harmful substances. In these cases, membership of a social circle can only be maintained if unhealthy behavior is maintained. This is particularly effective when there are no alternative circles in which social recognition can be achieved by other means (see above, Sect. 2.2). For this purpose, the “classical” psychological learning theories, such as conditioning or model learning, are discussed in the health context (e.g., Taylor, 2015, pp. 51–53).

However, even “well-intentioned” social pressure to stop certain harmful behavior or consumption patterns, or to adopt health-promoting behavior, can have negative, unintended consequences, for example, if it is experienced as a restriction

to one's own freedom and actors deliberately act in opposition to each other (reactance). Social pressure itself can generate stress and thus have a detrimental effect on health, for example, when pressure is exerted by close network partners in order to obtain certain support services and thus financial dependencies arise.

In particular, strong, emotionally close, and multiplex relationships are effective in exerting social pressure because they have a higher power of sanction. Pressure is likewise particularly strong in dense and homogeneous networks in which all network partners know each other and in which commonly shared attitudes are assumed. Peer pressure occurs with a higher probability in homogeneous networks than in less dense, heterogeneous networks, particularly if individual network partners do not act in accordance with the social norms or behavioral patterns that apply in these networks (cf. Burt, 1983; Marsden, 1987; Coleman, 1988). A higher density makes it easier to control individual behavior (deviating from the group norm) and to coordinate incentives and sanctions.

Besides social learning and social pressure, other forms of social influence are conceivable on the health and well-being of actors. For example, problems of network partners, such as chronic and other serious diseases, drug addiction, debt, and long-term unemployment, can also become problems of ego and other network partners who are not directly affected. Particularly in close, intimate relationships or in parent-child relationships, it is typical for problems of this kind from one person in the network to have far-reaching health-related effects on other network members (so-called *spillover effects*; Wendt et al., 2008).

The previous remarks on mechanisms of influence or pressure in relationship networks were conceived strongly under the direction of the effects of social relationships on the individual, but such effects are also examined in the opposite direction. The concepts of *social compliance* or *social conformity* (Guadagno, 2017; Hodges, 2017) serve as examples of this different view. Conformity refers to an individually initiated or intended change in (health) behavior with the aim of achieving agreement with others. Social compliance describes a conscious individual (health) behavioral change that occurs as a direct response to a request from others. The exact conditions and mechanisms of necessary or sufficient conditions for health-related behavioral changes are the subject of research. Current research shows the importance of so-called *local dominance* for both mechanisms (Suls & Wheeler, 2017, p. 82). This means that emotionally close and self-similar (homophile) relationships in the network have a high significance for conformity and consent effects. General descriptive or injunctive norms induce individuals to conformity or consent, but these effects are intensified if—according to a frequent operationalization in current research—the five most important reference persons of a respondent are named as the source of these norms.

2.4 Social Contagion

Research on social contagion focuses primarily on the *concrete mechanism of direct* (physical, emotional, unconscious) *transmission of* health-related entities (pathogens, affects, motives) between actors. The classical form of contagion in a narrower sense (without the adjective “social”) means transmission through physical, direct, or indirect contact between carriers of pathogens (viruses, bacteria, etc.). A distinction must be made for social contagion in a broader sense.

Since the 1980s, numerous studies on the spread of communicable diseases such as AIDS/HIV, tuberculosis, malaria, or Ebola have made use of the findings and methods of network research (cf. Klov Dahl, 1985; Hagel et al., 2017; Read et al., 2008). Central positions in a network, that is, individuals (groups) or institutions that are connected to a large number of actors, and *bridges* between different subpopulations are of particular importance for the spread of diseases—and also the containment of diseases, for example, through immunization and education programs. School-aged children are particularly at risk from respiratory infections because of the higher number of contacts compared to adults (Mossong et al., 2008). From a social epidemiological perspective, however, poor hygiene and infectious diseases have probably only been a minor cause of the (re)production of health inequalities over the past 40 to 50 years (Bartley, 2017, p. 108).

Social contagion is understood to be the process by which one person takes over an idea, motive, or behavior from another person (Burt & Janicik, 1996), usually assuming the social similarity between the two actors as a prerequisite for this transfer, which makes the takeover more likely. Socio-epidemiological studies have shown that network partners often behave similarly and exhibit similar health risks (eating habits, obesity, physical activity, smoking) (Christakis & Fowler, 2007; Fletcher et al., 2011; Macdonald-Wallis et al., 2012; Tay et al., 2013; Valente, 2015). These findings are often explained by the mechanism of (social) *contagion*, whereby it is seldom clear how exactly the social contagion processes take place or have an effect.

The process of social contagion is first of all dependent on the structures or social networks in which the actors are embedded. The frequency and intensity of contact with other persons or groups increase the probability of contagion. The more complex and unclear the structure is, the less likely it is that social similarities are perceived and contagion processes are triggered. It is not always possible to differentiate between the mechanisms of social learning and of social pressure, and the purely metaphorical use of the term is criticized (Lois, 2013).

One way of distinguishing social contagion from the abovementioned phenomena of social integration is to refer to the social-psychological concepts of *emotional contagion* and *mimicking* (Hodges, 2017; Bernardi & Klärner, 2014). This makes it clear that this is not about facilitating or complicating behavior that is already intended. Rather, emotional contagion describes the observation that individuals can spontaneously absorb emotional moods and associated behavior (laughter, crying, fear, joy, excitement, etc.) from other individuals or groups with whom

they come into contact (cf. Lippitt et al., 1952; Hatfield et al., 1994). Imitation refers to the unconscious or unnoticed adoption of attitudes, goals, or behaviors of others (Aarts et al., 2004; Marsden & Friedkin, 1993). Although this process is often described as unconscious, it is nevertheless selective, meaning that it follows certain patterns: It increasingly imitates other people who are perceived as reliable and are self-similar (homophile) or part of a close clique (Hodges, 2017). This mechanism thus emphasizes that behavior in complex social environments such as social networks can be influenced even below the threshold of one's own perception or consciousness, which consequently puts the rationality assumptions underlying some sociological theories of action into perspective.

The mechanisms of emotional contagion and imitation are placed in a context of rather short-lived and concrete social situations (e.g., a cheering concert audience), but there is evidence that longer-lasting emotional states, such as happiness or loneliness, also spread in social networks (Cacioppo et al., 2009; Fowler & Christakis, 2008; Hill et al., 2010). Martin and DiMatteo (2017) state that “[...] The social influence of health-relevant behaviors often goes largely unrecognized by the individual” (p. 386). They illustrate this with the example of research on food intake: Hetherington et al. (2006) were able to show, on the basis of an experimental study with 37 adults, that eating together with strangers consumes more calories on average than eating alone, although none of the respondents were aware of this effect. Salvy et al. (2009) showed on the basis of an experimental design with 54 adults that physical activity with others can be a suitable substitute for food intake. And Bleich et al. (2012) found on the basis of a representative survey with 500 American general practitioners that with the same education and formal qualification, those physicians with a body mass index in the normal range were significantly more successful in getting their patients to lose weight than the obese physicians—another example of a subliminal contagion mechanism.

3 Conclusion and Outlook

From this compilation of general mechanisms of action in social relationship networks—along the lines of the collective terms “social support,” “social influence,” “social integration,” and “social contagion”—it becomes clear that social networks can be multifaceted and indiscriminating in their effects. In other words, they can have both detrimental and beneficial effects on health. Social relationships and integration in social networks can not only support health, but can also be accompanied by negative role models or even conflicts between individual network actors or (sub)groups in these networks, which can have direct and indirect negative health consequences. These ambivalences and the health-damaging effects of social relationships are discussed in more detail in the chapter “[Negative Ties and Inequalities in Health](#)”.

With regard to the current state of research on the mechanisms of social networks in the context of health and health inequalities, the conclusion is twofold. On the one

hand, the current literature provides a sufficient amount of evidence pointing to the fundamental importance of social network effects for research and practice, or as Martin and DiMatteo (2017) recently summarized that “The use of social influence processes holds a good deal of promise in fostering health behavior, in individuals as well as in populations. The influence of **family members, friends, peers, and even perceived others** can be harnessed to maximize positive health behaviors across all developmental periods” (p. 390).

On the other hand, this fundamental promise has not yet been satisfactorily tackled, fulfilled, or implemented in many areas of research. An integrative model that places all the concepts and effects presented in a common context, delimits them, and also specifies them is still lacking. In our opinion, some of the conceptual ambiguities that we have found so far, which we have hinted at above, for example, in the close overlap between social integration and social contagion or the variety of constructs for social influence, are due to the low level of integration of the various disciplines involved. Heesacker (2017) also attributes this to the previous distance between the disciplines involved: “Arguably the most important future direction in this area is refocusing the efforts of social influence scholars back onto clinical applications of social influence theory and research” (p. 373).

Thus, the four collective terms we have chosen are quite heuristically useful for structuring the confusing field of social mechanisms of action in relationship networks. We have found that *social support* is a collective term that refers to packages of comprehensive support services for the individual (see also chapter “[Social Relations, Social Capital, and Social Networks: A Conceptual Classification](#)”). While there is already meta-analytical evidence for this collective term, which, still differs in the numerical strength of the identified health effects (between weak and moderate effects), two aspects in particular remain as research desiderata. Firstly, it remains unclear whether social support is a causal, concomitant (mediator/moderator), or a resulting variable of health inequalities. This is therefore the question of the conceptual location of social support in research on health inequalities. On the other hand, the question of the concrete partial effects of different network segments needs clarification. As we have seen, sometimes specific support services provided by concrete subsegments of a network seem to have consistently positive effects, but other services provided by other subsegments may also have negative health effects.

With regard to the collective term *social influence* as a generic term for direct health effects in the social context, we have distinguished social effects in the form of descriptive and injunctive (pressure) norms from the special individual prerequisites of *susceptibility, conformity, and compliance* for them. The consideration of network-person interactions seems to be particularly appropriate for further research, which to our knowledge has not been adequately implemented thus far.

However, indirect health effects whereby the individual being embedded in various relationship contexts in the forms of sociability, social engagement, associations, or work contexts (“embedding” was Granovetter’s famous term) also seem to be a future field of research that should not be underestimated. In this research area of *social integration*, we are less interested in direct health effects (e.g., in the form of norms) than in previous areas. Instead, we are looking at the extent to which social

recognition and appreciation as well as the socio-psychological effects of *facilitation, inhibition, or groupthink* can indirectly contribute to or make less likely the promotion of psychological well-being, but also behavior that can strengthen or weaken well-being in the long term.

While the first three collective terms are appropriate for the research-sided search for network factors for health inequalities, the fourth collective term of *social contagion* deals directly with possible and direct effects mechanisms beyond this. The empirical reconstruction of how and at what speed concrete pathogens or health-relevant motives, emotions, or ideas diffuse in relationship networks (often below the threshold of consciousness of individuals) points to further important research aspects that can supplement the aforementioned research on the effect factors of social relationship networks.

The need for a general, economical, and selective theoretical model is certainly not satisfied. If future research takes greater account of the distinctions that have been called for, especially between (1) direct vs. indirect and (2) positive vs. negative health effects caused by (3) different actors or sectors of the network, the theoretical situation should also be clarified and standardized as the number of empirical findings increases. Here, we see the interdisciplinary connectivity of the paradigm of social network research as particularly called for and suitable to initiate these future steps and to formulate them more concretely than before.

Reading Recommendations

Berkman, L. F., & Glass, T. (2000). Social integration, social networks, social support, and health. In: L. F. Berkman and I. Kawachi (Eds.), *Social epidemiology* (pp. 137–173). Oxford University Press. *Discussion and conception of important ideas about network theory and analysis for health research.*

Christakis, N. A., & Fowler, J. H. (2007). The spread of obesity in a large social network over 32 years. *The New England Journal of Medicine*, 357, 370–379. *Widely received and (critically) discussed longitudinal analysis of the spread of obesity via the mechanism of social contagion (also see Klärner & Keim, 2019).*

Harkins, S. G., Williams, K. D., & Burger, J. M. (Eds.) (2017). *The Oxford handbook of social influence*. Oxford University Press. *A standard work in which the social psychological concept of social influence is discussed in its various facets, including in relation to health.*

Klov Dahl, A. (1985). Social networks and the spread of infectious diseases: the AIDS example. *Social Science and Medicine*, 21(11), 1203–1216. *A classic study on the network mechanism of contagion.*

Small, M. L. (2017). *Someone to talk to*. Oxford: University Press. *This book provides an in-depth study of emotional and informational support processes within a graduate student sample. It suggests that the previous*

(continued)

structural theory of these processes, which attributes them to close and weak ties, separately, needs to be substantially expanded to capture the everyday experience of these young adults—and perhaps beyond.

Valente, T. W. (2010). *Social networks and health. Models, methods, and applications*. Oxford University Press. *Discussion and conception of important ideas about network theory and analysis for health research.*

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Negative Ties and Inequalities in Health



Philip Adebahr

Overview

- Negative ties are the aspects of a relationship, which ego perceives as incriminating.
- Cardiovascular disease and hypertension (physical), lower self-esteem, depression (psychological), and changed health behavior are possible health consequences connected with negative ties.
- Discrimination, availability of resources, and socialization are approaches that help explain the association between SES and negative ties.
- Further research is needed in order to sufficiently clarify the connection between SES, health, and negative ties as well as the causal mechanisms and directions.

1 Negative Ties: An Introduction

While concepts for positive ties are already widely discussed in network research, for example in the concept of social support or social capital (see chapter “[Social Network Theories: An Overview](#)”), the discussion on the meaning of *negative ties* is often lagging behind. Brooks and Dunkel Schetter (2011, p. 907) have identified a proliferation of terms describing negative ties: “Problematic social ties; social conflict; negative social exchange; social undermining; negative social interactions; stressor-specific social hindrance; social constraints on disclosure; stressor-specific unsupportive social interactions.” Social negativity, negative social ties,

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interpersonal conflict, negative aspects of close relationships, negative interaction, negative acts, the dark side of close relationships, and interpersonal/social strain complete this list of candidates for a common term. Furthermore, Labianca (2013, p. 8) observed a “proliferation of operationalisations of negative ties [. . .] e.g., distant relationships, difficult relationships, prefer to avoid, dislike, distrust, conflict, relationship conflict, task conflict, disrupts, excludes socially, being a political adversary, troubled relationships.” Depending on the theoretical approach (e.g., conflict theories, balance theory, and social capital approach), a different understanding of negative ties prevails. Nevertheless, a certain consensus exists in the following three *defining criteria* (cf. Borgatti et al., 2014, p. 9; Chauvac et al., 2014, p. 7; Heider, 1946, p. 107; Labianca & Brass, 2006, p. 597; Laireiter & Lettner, 1993). Firstly, there has to be a “tie,”¹ that is, a connection between the actors that is based on interactions. Secondly, the connection needs to have interpersonal tensions or *negative aspects* (e.g., due to competition for resources and violated reciprocity expectations). Here, it is important that ego perceives them as burdensome, so they are associated with feelings of aversion—fear, hatred, resentment, and so forth. It therefore makes sense to add Homans’ social exchange theory in order to distinguish under which conditions an individual considers the exchange to be successful or disadvantageous. According to Homans’ fifth elementary law of behavior, interpersonal tension arises. “When a person’s action does not receive the reward he expected, or receives punishment he did not expect, he will be angry. He becomes more likely to perform aggressive [be]havior, and the results of such behavior become more valuable to him” (Homans, 1974, p. 37). In other words, if there is a lack of reciprocity, it can be the basis for a negative tie assessment. Thirdly, a *dyadic* perspective is adopted (ego-age relation), which allows analysis on a social network level without neglecting the individual perspective. Thus, it is possible to differentiate between mutual and one-sided perceptions of the relationship and to trace the benefit of a mutual relationship.

While the dyadic perspective is easy to determine, there are still differences in the definition of the “negativity” and the “tie” component. Regarding this, three *concepts* exist. The difference between them is primarily evident in the degree of aggregation of the connecting elements between the ego and the alter. In the *first concept*, the individual’s interactions and chains of interactions create the connection. Simmel is one of the early advocates of this approach with his remarks on social conflict (in German “Streit”) (cf. Simmel, 1950 [1908]). At present, the term “social conflict” has become widely used. Although the concept of conflict provides a link to many scientific discourses (e.g., aggression and violence research), it is problematic from an analytical perspective. On the one hand, sociological conflict research makes less distinction between conflicts at the micro-level (between individuals)

¹We distinguish the term “tie” from the term “relationship.” According to Perry et al., “A relationship between two people can be decomposed into a (possibly unique) configuration of analytically distinct types of ties” (Perry et al., 2018, p. 161). Relationships are therefore understood as aggregations of the connecting elements called *ties*. In line with this, we speak of negative aspects of relationships or negative ties rather than negative relationships.

and macro-level (between social groups). For an illustration, see the definition by Bonacker and Imbusch. They define social conflicts as social situations in which at least two parties (individuals, groups, states, etc.) are involved based on differences in the social situation and/or differences in the constellation of interests of the conflicting parties (Bonacker & Imbusch, 2010, p. 69). Psychologists follow a far more precise distinction between two kinds of conflict: first, interpersonal conflict as the clash of two irreconcilable tendencies of action between persons, and second, intrapersonal conflict as the clash of two irreconcilable tendencies of action within a person (Nolting, 1998, p. 552). On the other hand, the term “social conflict” is problematic in the context of negative ties, since negative aspects of social relationships do not necessarily lead to conflicts. Several coping strategies for dealing with interpersonal tensions include conflictual behavior, loyalty, avoidance, and breaking off relationships (e.g., see voice, loyalty, neglect, and exit in Rusbult & Zembrodt, 1983). According to this understanding, interpersonal conflicts are logically accompanied by interpersonal tensions, but interpersonal tensions are not necessarily accompanied by interpersonal conflicts (the same applies to phenomena of violence). Actually, there is a more precise definition considering this distinction from behavior by focusing on perception. The definition of “social negativity” puts the focus on negative behaviors, which are perceived as aversive or unwanted (Brooks & Dunkel Schetter, 2011, p. 905).

Digression: Negative Ties and Violence

Dispute-related violence is a special form of conflict-related tension management. The connection between negative aspects of social relationships and personal violence is mediated through aggressiveness, which is not necessarily translated into aggressive, antisocial behavior. Moreover, not every act of violence is preceded by negative ties with the victim (e.g., in the case of predatory violence). The conditions under which aggression and acts of violence occur have interfaces with negative ties. For example, one conditional factor of the general aggression model is the dimension “external person” (Allen et al., 2018). An overview of aggression and violence research was presented by Heitmeyer and Hagan (2002) and Bogerts and Möller-Leimkühler (2013). In the case of domestic violence, there naturally is a connection between the persons (living together), and the victim experiences the violation as harmful or incriminating. Thus, regarding the victim, the criteria of negative ties are usually met. Research on social strain and peer pressure explains irregular behavior and can help to explain negative tie’s influence on deviant health behavior (Lee & Lee, 2020).

Attitudes form the *second* kind of aggregation reflecting negative connections. According to this perspective, it is not so much the single situation that is important for the description of a “connection,” but rather the overall evaluation of the relationship. According to Labianca and Brass (2006, p. 597), negative connections

are defined as a persistent, recurring set of negative evaluations, feelings, and behavioral intentions toward the alter.² Labianca and Brass argue that ego develops an overall assessment (like or dislike)—a so-called “*negative person schema*.” With a closer look, the overall assessment as a “negative relationship” is problematic. Negative aspects are usually associated with ambivalence or with a simultaneity of positive and negative aspects of the relationship, since a purely negative relationship, according to Klein Ikkink and van Tilburg (1999), is usually dissolved due to a lack of benefit (on ambivalence, see also Ajzen, 2001; Coser, 1956; Lüscher, 2011; Ross et al., 2019; Simmel, 1950 [1908]). In accordance with the equal importance of both aspects of the relationship, individuals will find it difficult to give a positive or negative overall assessment. We suspect a bias in favor of positive overall assessments, since ego uses the relationship strategically and thus puts the positive aspects in the foreground.

The *third* concept of negative ties comes from a social capital perspective. Accordingly, negative relations are those that prevent access to resources (Chauvac et al., 2014, p. 7) or reduce social capital (Borgatti et al., 2014, p. 9). The negative connection consists in a systematic blocking or hindrance of egos trying to get access to specific people or the alter. The social capital approach brings in an additional person into the perspective and changes the view from dyads to triads (see Heider, 1946 and chapter “[Social Network Theories: An Overview](#)”).

Although the reference to stigmatization, discrimination, and exclusion is obvious and research on bullying also speaks of “negative ties” (e.g., Kaur & Singh, 2015, p. 24), the link to this macro-sociological perspective is not clear. This is because the unambiguousness of the micro-sociological definition criteria (*perceived negativity, dyad perspective, connection*) gets lost in the macro-sociological abstraction. First, ego can remain unconscious of discrimination or exclusion (no perceived negativity). Second, the introduction of the relational triad indicates that discrimination can take place even though ego and alter are not interacting directly with one another. The conversation about the discriminated group leads to an avoidance of this group where interaction remains unconsidered (no connection).

The fact that there is a connection between ego and alter is a central aspect of negative ties. However, we need an explanation as to why negative connections persist over time. Offer and Fischer (2018, p. 3–6) provide two possibilities. First, relationships are maintained for strategic cost–benefit considerations. For example, the relationship with an ophthalmologist may be of strategic benefit if ego often has eye complaints but the nearest ophthalmology practice is 50 km away. In this case, a short informal telephone call may save the costly trip to the ophthalmologist. Second, the individual has limited alternatives to this helpful friend and is therefore unable to end the incriminating interaction. Ultimately, a relationship can be so beneficial that the costs, that is, the negative aspects of the relationship, are accepted.

²Labianca and Brass thus carry on with Heider’s research on attitudes, which also takes up the cognitive, affective, and behavioral dimension. See Ajzen (2001), Banaji and Heiphetz (2010), Heider (1946), and the “*social ledger theory*” presented by Labianca and Brass (2006).

According to the second argument, Hess (2000) argues that relationships continue to exist because of costs that are difficult to settle, so-called *external and internal barriers*. External barriers arise outside the individual and include the binding of the ego and alter through institutional membership of social groups (e.g., church, associations, and kinship), financial obligations and contracts (e.g., joint loans or responsibility for children and housing), or physical proximity (e.g., through neighborhood and workplace) (Bushman & Holt-Lunstad, 2009, p. 754; Hess, 2003). According to Hess (2003), internal barriers consist of the individual's inner desires and beliefs that lead to the maintenance of a relationship, even if these include negative aspects. Thus, internal barriers contribute to the maintenance of a relationship: so-called *self-identity goals* that are anchored in the identity and self-image of the individual. Then come the associated feelings of responsibility, duty, and commitment (*sense of commitment*), followed by beliefs and convictions, such as those of charity and forgiveness (*religious beliefs*). Hess adds on subtle fears of the consequences that are connected with the dissolution of a relationship (e.g., the fear of hurting someone) (Hess, 2000, 2003, 2016). Therefore, we should understand negative ties as part of ambivalent relationships, where negative and positive aspects come together.

In summary, we characterize *negative ties* by a *connection* (1) between ego and alter (*dyad perspective*) (2), which contains a lack of reciprocity and is therefore *perceived* by ego as negative or *burdensome* (3). Negative ties are often connected with exit barriers that are difficult to remove. There are also differences as to whether the negative aspects are understood as tension-filled single situations (interpersonal tensions), as an aggregated overall assessment of the relationship (attitude), or structurally, as barriers to get access to certain persons and networks. In order to take up the current research discourse in all its facets, we speak of negative ties and consider both single situations and overall assessments as each of them contain negative ties. *The central question of this chapter deals with the exploration of the state of research on the contribution of negative ties to the reproduction of health inequalities.* After having explained what we understand as negative ties, in Sect. 1 we will discuss the relationship between negative relationships and various health parameters in Sect. 2. The question of the extent to which this influence is socially unequally distributed is addressed in Sect. 3. Section 4 concludes with a summary and an outlook where we address the main desiderata for research on negative ties and health inequalities.

2 Negative Ties and Health

Although negative aspects of relationships are less frequent than positive ones (Labianca & Brass, 2006; Offer & Fischer, 2018), empirical findings suggest that, in certain cases, stress from social relationships has a greater health-related effect than positive aspects of relationships (Rook, 1998; Brooks & Dunkel Schetter, 2011). However, there are different results on the prevalence of negative ties

depending on sample and operationalization—negative ties in personal networks make up to 8% (Labianca & Brass, 2006, p. 597). More recent findings indicate that the proportion could be much higher in the general population. Offer and Fischer (2018, p. 1) report for the first wave of UCNets (University of California Social Networks Study) that 15% of all relationships are considered “sometimes demanding or difficult.” They examined two cohorts: 21- to 30-year-olds and 50- to 70-year-olds. In terms of effects, Rook (1984) shows for older widowed women that the number of stressful relationships has a greater influence on psychological well-being than the number of supportive relationships. In addition, Cacioppo et al. use the term “negativity bias” to explain that negative information in the brain is given greater significance than positive information (Cacioppo & Gardner, 1999; Ito et al., 1998). Empirical evidence on the connection between negative ties and health comes from different domains. We focus on the following three. Following the argument that negative ties are based on a lack of reciprocity, we can refer to the empirical findings on the effort–reward imbalance model (ERI) (Siegrist, 1996). Although the dyadic aspect is missing in ERI, it is based on the assumption that an imbalance between performed work and received rewards (lack of reciprocity) causes health problems. Knesebeck and Siegrist (2003), Chandola et al. (2007), and Knesebeck et al. (2009) show evidence for ERI in private relationships outside the labor context. Another approach that centers on the social support perspective works with the term “negative social interaction” or negative ties (e.g., Newsom et al., 2008; Offer, 2020). The third approach is based on social strain theory. Agnew (1985) combined earlier concepts with the so-called general strain theory. He focuses on hundreds of types of strains in order to identify those that provoke crime. The social strain approach mainly aims on explaining deviant behaviors (e.g., suicide, drug abuse, and smoking). However, these domains work in disconnect (cf. Offer, 2021). There is consensus on referring to the mechanism of stress to explain effects on health on a biopsychosocial level. As negative aspects of social relationships are often persistent due to strong exit barriers, they are a chronic social stressor (see chapters “[Social Networks and Health Inequalities: A New Perspective for Research](#)”, “[Social Networks and the Health of Single Parents](#)”). This leads to recurring or long-lasting activation of the body through the stress reaction. This means that the body is put into the “fight-or-flight” state (Cannon, 1932).³ This leads to an increase in heart rate and blood pressure, increased lung ventilation, and the release of fatty acids and glucose (von Dawans & Heinrichs, 2018). In addition, digestion and antibody production are inhibited (von Dawans & Heinrichs, 2018). The permanent existence of stress-related processes in the body is called “allostatic load.” Interactions that people permanently perceive as negative are associated with high allostatic loads (Seeman et al., 2014). The stress-induced development of disease (allostasis) has already been widely researched (e.g., Rensing, 2013). The association between

³Stress response depends on the context, its perception, and individual and social factors. For example, the “female” stress response is described as a “tend-and-befriend” reaction (Taylor et al., 2000; for more details, see Seidel et al., 2013).

social stress and cardiovascular diseases is well known, for example, in the case of high blood pressure (Sneed & Cohen, 2014), coronary heart disease (Orth-Gomér, 2007, 2009; de Vogli et al., 2007), or strokes (Tanne et al., 2004). The endocrine system (hormone balance) is also altered by negative interactions. Persistent negative interactions are associated, for example, with high cortisol levels, which weaken the immune system and increase susceptibility to disease (von Dawans & Heinrichs, 2018; Siegrist, 2018). Social stress also reduces wound healing (cytokine production, IL-6, TNF α , IL-1 β) or inhibits the associated post-production and renewal of dying cells (Kiecolt-Glaser et al., 2005; Wright & Loving, 2011).

2.1 Negative Ties and Physical Health

In line with the effort–reward imbalance model, there is strong evidence for the association between violation of reciprocity and individual health (Siegrist, 2005; van Vegchel et al., 2005; Siegrist & Li, 2016). Beneath connections with higher blood pressure, insomnia, indigestion, cortisol, and risk of diabetes, research on cardiovascular disease (CVD) is most prevalent with strong empirical evidence (Siegrist & Li, 2016). After analyzing the harmonized data of 11 European prospective cohort studies with a total of 90,164 individuals, Dragano and colleagues draw the conclusion that “Individuals with effort-reward imbalance at work have an increased risk of coronary heart disease, [. . .] this appears to be independent of job strain experienced” (Dragano et al., 2017). Reviews on CVD and ERI support this result (Li et al., 2015; Kivimäki & Siegrist, 2016).

From a social network perspective, there are several overviews on negative ties and health. Brooks and Dunkel Schetter (2011) provide an overview of the literature on social negativity and report associations with less physical health, lower self-rated health, higher morbidity, and mortality, without being exhaustive. A review by Rook (2015), of positive and negative exchanges on health and well-being, focuses on later life. She argues that negative ties (when they occur) have a greater effect on health than positive ones. She reports associations with hypertension, allostatic load, incident coronary events, and mortality due to stroke (Rook, 2015, p. 3). Berkman and Krishna (2014, p. 247) as well as Offer (2021, p. 185f) also provide short overviews. While there is extensive evidence for the supportive effect of positive ties (Holt-Lunstad et al., 2010; Berkman & Krishna, 2014) and the disruptive effect of negative ties on health (Brooks & Dunkel Schetter, 2011; Rook, 2015; Offer, 2021), the interaction between negative and positive ties in the form of ambivalence currently drives the discussion (Ross et al., 2019). Ross et al. (2019) provide an overview of 15 studies that consider the interactive and independent effects of positive and negative ties. They conclude that ambivalent relationships have an effect on health that is independent of positive and negative aspects. Uchino et al. (2012, p. 793) “found the number of ambivalent ties to predict greater cellular aging even after considering a stringent set of control variables (e.g., age, health behaviors, and medication use).”

From a social strain perspective, Guevara and Murdock (2019) report results from the Midlife in the US (MIDUS 2) study (N 763): “Greater social strain was associated with poorer self-reported health (SRH) due to the serial pathway from high anxious arousal to BMI and inflammation” (Guevara & Murdock, 2019, p. 155).

Another physical consequence of negative ties can be physical injuries due to physical violence. As discussed in Sect. 1, violence can be a coping strategy (extreme form of conflict coping) for interpersonal tensions.

2.2 Negative Ties and Mental Health

From the ERI point of view, Theorell et al. (2015) see limited evidence for the association between ERI and depression. They review three studies related to this topic. Two years later, the review by Rugulies et al. (2017) reveals a statistically significant relationship between ERI and a risk of depressive disorders in seven out of eight prospective studies. All eight studies analyze self-reported depression measurements. Wege et al. (2018) close this gap. They reveal robustness of these findings referring to medically diagnosed depression. In addition, Shimazu and Jonge (2009) analyze the causality by using cross-lagged panel regressions (3 waves, 211 Japanese male blue-collar workers). As a result, they find evidence for causality from ERI on psychological distress and physical complaints, while reversed causality exists for mental distress on ERI. Knesebeck and Siegrist (2003), Chandola et al. (2007), and Knesebeck et al. (2009) provide evidence outside the labor context for ERI and higher depression, sleeping disorders, lower mental, and physical health.

An investigation from the negative social exchanges approach comes from Newsom and colleagues (2005). In a study with 916 older adults, they analyzed why a negative social exchange has a greater impact on psychological health than a positive exchange. While using structural equation modeling, they found that a negative social exchange is related to decreased well-being and greater distress. At the same time, a positive exchange is related to increased well-being but less strongly than a negative social exchange. Moreover, they show the underlying process that satisfaction with positive and negative exchanges mediates the links on psychological health (well-being and distress).

However, small fights and arguments can be associated with poor mental health. An explanatory approach is offered by the sociometer theory, according to which self-esteem is an indicator (sociometer) for one’s own social integration (Leary, 2005). According to the sociometer theory, interpersonal conflicts and rejections can reduce psychological resources (e.g., self-confidence and self-efficacy assessment) (see Leary, 2005, 2012). On the other hand, Kiviruusu et al. (2016, p. 2) show that low self-esteem increases the probability of interpersonal conflicts. For a critical, empirically focused discussion of this theory, see the meta-analysis by Blackhart et al. (2009). Both resources (self-awareness and self-efficacy assessment) are

negatively associated with depression. Based on a panel study, Stafford et al. (2011) found connections between negative social interactions in close relationships (family, close friends) and depression. In contrast, positive exchanges are not necessarily associated with less depression (Lincoln et al., 2010).

2.3 Negative Ties and Health Behavior

From a sociological perspective, individuals in a social network can collectively act as a control instance, and negative relationship aspects are a form of sanctioning that is intended to influence people to behave in a certain way (cf. Peuckert, 2006). How individuals deal with sanctioning not only depends on the appraisal of negative exchange (Newsom et al., 2005) but also depends on the chosen coping strategy. Although the concept of stigma is not equal to negative ties (see Sect. 1), we can draw knowledge from research on stigma and bullying for an example. On the one hand, weight stigma may lead to various disadvantageous behaviors like avoidance of preventive check-ups, reduced motivation for sporting activities, and refusal of diets (Drury et al., 2002; Puhl & Brownell, 2006; Sykes & McPhail, 2008). On the other hand, coping strategies can reinforce health-promoting behavior. Participation in a self-help group for overweight people, for example, increases the probability of weight loss. In this case, “coping” and “health behavior” are two words for the same behavior.

As there are generally different coping strategies on stress (Hobfoll, 1998), it is interesting from a public health perspective to note the conditions under which people chose self-harming or deviant behaviors. General strain theory is a well-established research tradition that explains deviant (health) behaviors by perceived stress and anger (Agnew & Brezina, 2019). We can rediscover negative ties in the three types of strain: strain from losing something good and valuable; strain from being treated in an aversive or negative manner; and strain from being unable to achieve goals (Agnew & Brezina, 2019, p. 145f). Conceptually, there is an important difference between negative ties and social strain. While social strain comes from various social and environmental elements, negative ties focus on dyads as a small part of this environment. Suicide is a common example for the relationship between social strain and individual health. It also reveals some problems regarding negative ties. While isolation and social contagion seem to play important roles in suicide (Mueller et al., 2021), the influence of negative ties on both of them seems to be quite complex and unclear. For example, special negative ties could be a sign of exclusion (e.g., having a bully). They can also be a sign for integration, because they seem to occur mostly in close relationships (Coser, 1956). Just how and under which conditions negative ties contribute to social strain has yet to be revealed. Apart from suicide, there are other health-related behaviors associated with social strain and peer pressure, like smoking, eating disorders, and alcohol and drug abuse (Merton, 1957).

Swatt et al. (2007), for example, examine whether work-related strain is related to problematic alcohol consumption among police officers in Baltimore, Maryland. Logit and ordinal logit regressions reveal evidence. Furthermore, they show that problematic alcohol consumption is mediated by anxiety and depression.

Although the studies mentioned do not measure negative ties directly, some evidence shows that negative aspects of social relationships contribute to the reproduction of health inequalities in the following ways:

1. On a physical level, stress forms negative tie correlates with high blood pressure, higher risk of cardiovascular disease, insomnia, and indigestion.
2. At the mental level, negative ties relate to reduced mental health, for example, in the form of lower self-esteem and a higher risk of depression.
3. In certain cases, social pressure from negative ties can lead to changes in health behavior, whereby the effects that inhibit or promote health depend on individual contexts. Apart from suicide, alcohol and substance abuse, smoking, and eating disorders are also related to social strain.

3 Social Status and Negative Ties

After discussing the connection between negative ties and health in Sect. 2, this section will examine social inequality. During our research, we did not find studies that systematically analyze the influence of negative ties on the association between socioeconomic status (SES) and health parameters. Instead, we explore the thesis that SES and negative ties are related to one another. More precisely, we look at the theoretical and empirical evidence that links lower SES with ties that are negative. This evidence may partly explain lower health at low SES, although further investigation is needed.

Krause et al. (2008, p. 1013) use two data sets with American seniors to show that *financial difficulties* are associated with more *negative interactions* (action-oriented concept, see Sect. 1). In addition, they find no educational effects associated with negative interactions across both data sets. Furthermore, their results suggest that the effects of personal economic difficulties are inhibitory to health when there are more negative social interactions. Negative interactions in the form of “not getting help when it is expected” further reinforce the effect of financial tensions on self-rated health (Krause et al., 2008, p. 1013).

Offer and Fischer (2018), on the other hand, surveyed people who were perceived as particularly difficult. According to this, the results of the University of California’s Social Network Study (UCNets) show opposite effects with this different operationalization. In contrast to the effect of financial tensions just reported, the multivariate analysis by Offer and Fischer does not show a significant connection between *income* and the number of *people perceived as difficult*, whereas education shows a significant connection with people perceived as difficult. In the group of people aged between 50 and 70 years, those without higher education have fewer

people in their networks who they perceive as being difficult, but at the same time there are more people who they perceive as being ambivalent (Offer & Fischer, 2018).⁴ In summary, existential financial difficulties correlate with negative interactions independent of education, whereas the number of people perceived as difficult depends on the level of education (independent of income). According to de Vogli et al. (2007), people in lower-status groups are more likely to be exposed to negative ties than people in higher-status groups.

There are three explanations for the relation between SES and negative ties. The first argumentation that attempts to explain the connection between financial problems and negative ties comes from Krause et al. (2008) (explanation B). They argue that people with low SES, who have limited resources and the need for assistance, also have difficulties in providing adequate reciprocal services. This tends to lead to burdens and social tensions. Social networks tend to homogenize in the status of their members (Belle, 1983; Phan et al., 2009).⁵ This means that social networks of low-status people likely include more people with financial difficulties, which in turn increase the probability of social tensions arising from financial difficulties. Hobfoll (1998, p. 208) calls this effect the “pressure cooker effect.” Krause et al. (2008) argue that if people themselves have too few resources to cope with problems, they will find it difficult to support others with their problems. Empirical evidence shows that the support from networks of low-status people is often lower, sporadic, unreliable, and characterized by tensions (Offer, 2012, p. 789).

In terms of socialization theory (explanation C), people with lower social status are more likely to experience conflicts because they are raised in everyday life situations, where conflictual behavior is a common solution to resolve social tension (less cooperative behavior). It remains to be examined as to what extent the threat of a loss of resources in lower social strata is seen as more threatening to their existence (than in higher strata) and thus the reaction on social tension is more radical (either anti- or prosocial). Greitemeyer and Sagioglou (2018) present results showing a tendency. They observe that four out of five studies consider that low SES is more associated with behavior that is aggressive.⁶

According to research, processes of social closure and discrimination in the form of bullying in schools are distributed socially unequally. This is a third explanatory approach for the connection between SES and negative aspects of social relationships (explanation A). According to this, people with low SES are more likely to be discriminated against. Although SES is a weak predictor of bullying in school, the meta-study by Tippett and Wolke (2014) shows a significant positive correlation between low SES and the likelihood of being a victim of bullying. The same applies

⁴There are no significant results on education for the group of people aged 21–30.

⁵The process by which people find themselves in social groups according to the same characteristics is referred to as homophile (Lin, 2000).

⁶In addition, studies (e.g., Piff et al., 2010) suggest that lower SES is also associated with more prosocial behavior. However, according to Greitemeyer and Sagioglou (2018), this finding proves to be of limited reliability.

to the workplace. Tsuno et al. (2015) report a significant correlation between low SES and more bullying revived.

To sum up this subchapter, there is a model, which integrates all aspects previously mentioned in a more general form. McCubbin and Patterson (1983) call this model ABC-X model. Within this model, the burden of negative relationships (X) depends on the type of stressors. We mentioned discrimination as an example (see explanation A). The existing resources are another factor (see explanation B). The interpretation of stressors is a third factor. Socialization may shape the interpretations of and reactions on stressors (see explanation C).

4 Conclusion and Discussion

The aim of the paper was to explore the state of research on the contribution of negative ties to the reproduction of health inequalities. To this end, we discussed the term “negative ties” and introduced sociological and psychological concepts as well as possible connections with health and social status. We characterize negative ties by an interaction that ego perceives as tense. Therefore, a connection (*tie*) between ego and alter (dyad) is necessary to show interpersonal tensions due to violated reciprocity (negativity). Non-breakable exit barriers often accompany these ties and lead to ambivalent relationships. Negative ties affect the body via acts of violence and stress, with corresponding consequences for physical (e.g., a higher risk of CVD, high blood pressure, indigestion) and mental health (e.g., lower self-esteem and a higher risk of depression). They also influence health-related behaviors that can, for example, lead to insomnia, eating disorders, smoking, or alcohol consumption. While there are different coping strategies on social strain, negative ties can be inhibiting or beneficial. From a social science perspective, we need to explain under which conditions peer pressure can lead to beneficial health behaviors. The ABC-X model (McCubbin & Patterson, 1983) offers an integrating approach to explain the relationship between SES and negative ties. Even though research suggests that there is no significant connection between financial income and persons deemed difficult, having financial problems correlates with having negative interactions. In addition, people with lower SES (weak predictor) have an increased likelihood of falling victim to bullying and showing more aggressive behavior. The explanations in Sects. 2 and 3 support the thesis that negative ties partly explain the influence of social status on health. Based on the findings, the explanatory power of negative ties seems to be relatively low. Nevertheless, an analysis of the extent to which negative ties explain the relationship between SES and health has yet to be done.

In the remarks made so far, considerable gaps in research have already become apparent. However, there are a few more limitations and aspects that are interesting to note. In the research on negative ties, there is a multitude of different terms and measuring instruments that all denote similar aspects but have not yet been systematically brought together. If we understand negative aspects of social relationships as a collective term for many different phenomena, it is worth differentiating between

them by looking at what negative aspects there are (e.g., avoidance, conflict, and violence) and how they are associated with health and social inequality. In particular, we hardly noticed negative ties that exist through the avoidance of tensions.

Furthermore, there are three points to discuss the connection between negative ties and health. First, we need to discuss the causal inferences. Social tensions not only affect health, but health also affects social tensions. This is given little attention in research. For example, a study using SOEP data from 2002 to 2008 found that a deterioration in health results in a significant reduction in satisfaction with social contacts (Kriwy & Nisic, 2012). We also know that the use of various drugs (alcohol, cocaine) promotes aggression (Ntounas et al., 2018). The same applies to the connection between negative ties and social inequality. Looking at current studies, researcher often assumes that negative ties have an effect on social inequality. Social inequalities, however, may have an effect on negative ties as well. To determine the extent to which negative aspects of social relationships contribute to social inequality and vice versa, time-sensitive data or experimental designs are required.

Second, especially with regard to health effects, very few studies work with the methodological tools of network analysis, which would allow further insights. From a network perspective, it is interesting to learn the extent to which negative relationship aspects contribute to the formation of groups and network boundaries, the extent to which stress and negative relationship aspects spread in social networks (social contagion), and how this results in “stressed networks” or negative tie networks. Of particular interest is a process perspective. Coser (1956) theorizes that conflicts can make opponents more familiar with each other. This leads to the emergence of common norms and thus promotes the development of networks between them in the long term (Coser, 1956). In addition, he sees conflicts themselves as social relationships, insofar as people repeatedly negotiate their power relations (Coser, 1956).

Third, research on social conflicts often emphasizes their benefits (Bark, 2012; Coser, 1956; Simmel, 1950 [1908]); this also applies to negative aspects of relationships and possible health-promoting effects. The extent to which negative ties have health-promoting effects—for example, through demarcation and the building of identity (Jetten et al., 2017), activation, increased motivation, or the distraction from chronic diseases—could be questions posed from a more salutogenic perspective. Ultimately, it is important to understand negative ties without value judgment as part of a process of interpersonal tension and relaxation, with static and dynamic phases (see Bark, 2012, p. 11; Rüssmann et al., 2015, p. 501).

Reading Recommendations

Coser, L. A. (1956). *The functions of social conflict*. The Free Press. *Coser works up Simmel's text on conflict systematically and formulates 16 theses on functions of social conflict. Thereby he takes the use of social conflicts into view.*

(continued)

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Network Analysis and Health Inequalities: A Methodological Introduction



Markus Gamper 

Overview

- Networks consist of actors who are connected by relationships and whose connections are made up of different social structures.
- It is assumed that social networks have an effect on the actors and that actors influence the networks, in turn.
- There is a distinction between whole networks and ego-centered networks. In the whole network analysis, the respective actors and their relations are considered within predefined limits. In the case of egocentric networks, the interpersonal networking of a particular actor is at the center of the analysis.
- Methodologically, a distinction can be made between qualitative—often consisting of visual access—and quantitative network research. So far, the focus in health research has been more on quantitative approaches.
- Tested methods of network analysis in health research do not generally exist. Research must therefore always be adapted to the research issue.
- The time required to collect network data can be very high, so network surveys should always be tested in pre-tests.

1 What Is a Network?

“Networks” seem to be omnipresent in modern societies (e.g., networking, online social networks such as Facebook and Twitter, or even criminal and terrorist networks), but the term and its meaning in everyday life often remain amorphous.

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In order to be able to work with the concept in a scientifically adequate way, this chapter introduces the term “social network,” different forms of network analysis, and survey and data evaluation strategies. What follows is a short overview of different methods and important literature references are given, which can be referred to in more detail, if necessary.

The axiom of network research assumes that elements—so-called nodes—can enter into relationships—so-called edges—with other elements. The smallest unit of such social relations is the dyad, the relation between two actors. Dyads, in turn, do not exist solitarily, but join together to form larger networks, where they also form certain structures. However, a uniform definition of (social) networks does not exist. How a network is defined also depends on the object under investigation.

A network can generally be understood as “[...] a set of relevant nodes connected by one or more relations” (Martin & Wellman, 2011, p. 11). This definition can be applied to social as well as non-social, technical, or physical-material elements such as road or electricity networks. Besides this formal definition of networks, there are definitions that focus more on social action and the mutual influence of networks and action. Clyde Mitchell, for example, defines social networks as “[...] as a specific set of linkages among a defined set of persons, with the additional property that the characteristics of these linkages as a whole may be used to interpret the social of the persons involved” (Mitchell, 1969, p. 2).

Networks differ from the sociological concept of groups in that their existence is determined by the drawing of *boundaries*, not by *fundamentally* open relations: “(A) fundamental part of the concept of a group is the existence of boundaries” (Borgatti & Halgin, 2011, p. 1169). The concept thus distinguishes between *ingroup* and *outgroup*. In some cases, however, groups are also referred to as networks, although social relationships within the group are not explicitly investigated at the dyadic level, but rather presumed. Groups can thus also be understood as a subcategory of particularly dense networks. “(U)nlike networks, [groups] depend upon the merging of social relations within a shared space and with a recognizable culture. Although groups are distinguished from networks through their boundaries, pasts, and identifications, groups are in some regards dense networks” (Fine, 2012, p. 168). In contrast to classical social science methods, network analysis includes not only personal attributes (e.g., gender, age, income) but also relational attributes (e.g., positions of actors in networks). It is thus assumed that the structure of social networks (e.g., support networks) and social outcomes (e.g., health behavior, health) are interdependent and influence each other.

Networks thus consist of so-called nodes (e.g., individuals or collective actors) and relationships, the so-called edges (e.g., kissing, passing on viruses, social pressure), by which the nodes are connected.¹ The aim of network research is to make causal statements about the effect of relationships on the actors (or vice versa) or to be able to describe the actors and their relationships.

¹On the distinction between group and network, see also Borgatti and Halgin (2011).

2 Ideal Types of Network Research

Although a network can generally be described as a set of nodes and edges, there are significant differences with regard to the empirical procedure, both in the data collection and in the data evaluation. Ideally, network research can be differentiated along two dimensions (Gamper & Schönhuth, 2020). Along a structural dimension, whole networks and egocentric networks can be distinguished, while along a methodological dimension, quantitative and qualitative procedures of network research can be distinguished. In empirical practice, it is of course possible to deviate from these ideal types. For example, there are research projects that use both qualitative and quantitative methods simultaneously and connect data by triangulation (Dominguez & Hollstein, 2014).

2.1 *Whole Networks and Ego-Centered Networks*

The whole network analysis focusses on nodes and their edges within predefined borders. The emphasis is on the internal networking of the actors in this predefined area (e.g., sex partners in a school, transmission of diseases in a village, influence of smoking behavior in an association). In the ideal-typical case, the relations outside these defined limits are not included in the analysis. Thus, the research focus is on a certain number of actors and their very specific relationships. The demarcation of the boundaries should be well justified and described, since every distinction has an impact on the data and results. Boundaries can be determined, for example, on the basis of certain theories or even empirical knowledge. In research, however, there are also pragmatic demarcations that are due to the field of research (Laumann et al., 1983). Usually actors (e.g., pupils) are asked about their connections to other persons (e.g., classmates) in a predefined area (e.g., school class). In addition to predefined lists of names, with the help of which the relevant contact persons only have to be selected, the interviewees can, in some cases, determine the names of the contact partners themselves. However, these contact persons must be part of the predefined set (e.g., school class). In addition to the relationship parameters (e.g., friendship relationships, love relationships), the respondents are asked further questions about themselves (e.g., age, health status, body mass index). Building on this, all relationships and attributes are transferred into a whole network. In other cases, for example, on the Internet, data on relationships (e.g., Twitter, Facebook) are already available in digital form. A rarely used method of data collection is participatory/non-participatory observation (Desmond, 2014). Here, relationships between actors are registered and recorded on the basis of observations, such as the passing of cigarettes to the schoolyard. In many studies, these results are presented or depicted visually.

A prominent example of a whole network analysis from the field of health research is the investigation of romantic and sexual networks in Jefferson High School located in a small town in the USA (Bearman et al., 2004). The study focuses

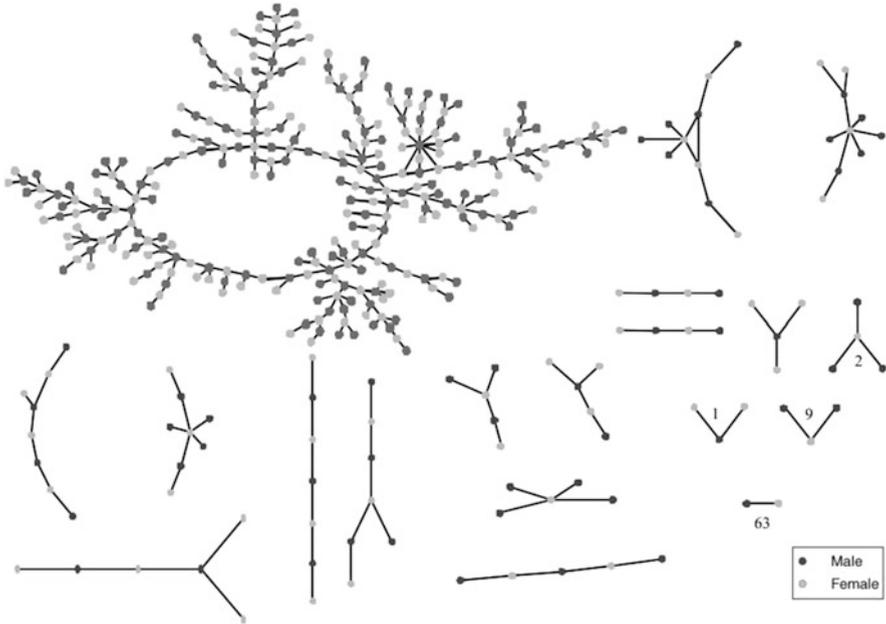


Fig. 1 Sexual and romantic relationships of female students* within Jefferson High School. Source: Bearman et al. (2004, p. 58)

on the risk of infection with sexually transmitted diseases in adolescents and the possibility of prevention. For this purpose, the whole network of about 800 students at Jefferson High School was surveyed. The nodes in this case are the pupils of the school. The edges depict the romantic and sexual relationships between them over the last 18 months. Here, 573 students stated that they had entered into one or more such relationships.

Different ways of establishing relationships with others result in different forms of networks. These range from simple dyads to triads to a large network component with many actors interwoven in different ways (see Fig. 1). By comparing them with randomly *generated networks*, the researchers were able to determine that the observed structures differ radically from the randomly generated networks. Specifically, we find that real sexual and romantic networks are characterized by much longer contact chains and far fewer cycles (Bearman et al., 2004, p. 44). As a result, many people (here just under 50%) are indirectly connected to each other and thus cannot keep track of the number of sexual relationships in their entirety. An indirect chain of relationships results, for example, when a sick “pupil A” had a relationship with “pupil B” and the latter then enters into another relationship with “pupil C.” If C does not learn about the relationship between A and B, C has no idea that B could transmit the diseases of A to C. Through this kind of networking, a disease can be transmitted quickly and infect a large number of students. In order to avoid infection, it is therefore important to “break up” the large cluster so that the virus can be

stopped in its spread. This requires changing the behavior of some students (e.g., by using contraceptives), as the cluster will then break up into individual chains and the infection will be reduced.

As the example illustrates, the network boundary is the “school grounds” of Jefferson High School. Therefore, “only” the romantic and sexual relationships of the students of this school are analyzed. Sexual and romantic relationships with people outside the school, such as pupils in another school, are not considered here. In addition, other types of relationships (e.g., friendships), beyond sexual and romantic relationships, are not included in the analysis.

The egocentric network research is subject to a slightly different logic. Here, the interpersonal networking of a specific actor, the ego, is the focus of attention. From the point of view of the respondent (= ego), certain persons and their relationships to one another are questioned (Burt, 1980; McCallister & Fischer, 1978; Wellman, 1979). The ego-centered network consists of relationships of the respondent actor (ego) to other actors in their network, the so-called alters, with whom they are directly linked. In some studies, ego is also asked about relations between the alters.

First, ego is interviewed about their subjective view on their relationships and has to name persons with whom they have certain relationships (e.g., smoking together, sexual relationship, exchange of syringes), usually predefined by the researcher. These questions are also called actor generators (these include, for example, name generators, resource generators, position generators), since these generate network actors. The best known are the name generators, which can be divided into interaction-approach (e.g., with whom have you interacted [...]), role-relation-approach (e.g., three best friends), affective-approach (e.g., actors you feel close to), and exchange-approach (e.g., who helped you) (Bidart & Charbonneau, 2011; Marin & Hampton, 2007).² There is no predefined list of names, as in the case of the whole network analysis. The researcher does not know the names of the contact persons in advance and there is no clear border in the whole of network research (e.g., Suitor & Pillemer, 1993). Therefore, the researcher has to decide how many alters should be collected and how the border of the ego-network is defined (McCarty et al., 2007). This is an important process, because it does affect the duration of the survey, the effort of the interviewee to answer the survey questions, and the time to assess the alter-alter relation. An overview of possibilities is discussed in the article by Perry and Roth (2021).

Based on this concept, ego is asked to provide further information about the named alters and the relations between ego and alters (so-called actor interpreters). At the end, information about ego will be asked. This could be, for example, socio-demographic information, smoking behavior, or health status. Many studies also ask ego questions about the relationships between the alters, for example, to what extent the alters are in contact with each other. This is not absolutely necessary if certain statistical measures or questions are not considered essential for one’s own question (McCarty et al., 2016). In contrast to the whole network analysis, where the contact

²This can also be used for whole network analysis.

persons are specified by some kind of border, the interviewee is free to name them. In addition, the information about the alters (e.g., gender, health status) comes from ego and not from the alters themselves.

An example is the longitudinal study by Perry and Pescosolido (2015). The researchers asked about 171 persons (egos), who the egos contacted in the case psychological illness. The research interest was focused on the activation of support services and the kind of networks that were used for the health issues of egos. The sample consisted of a group of patients with severe mental illness and a group with less severe disorders who were receiving psychological treatment for the first time. The following actor generator (here specifically a name generator) was used in the study: *“I’m interested in who, among all of the people in your life, you talk to about health problems when they come up. Who are the people that you discuss your health with or you can really count on when you have physical or emotional problems?”* (Perry & Pescosolido, 2015, p. 119). In contrast to the study by Bearman et al. (2004), the focus here is not on the connection of the actors within a certain boundary and between these persons, but on the effect of persons on the well-being of the egos against the background of their personal networks. In other words, they were trying to determine which networks can be helpful for ego to feel more comfortable. The aim was to make general statements. As the study shows, networks play an important role especially against the background of emotional support and information: *“Social networks have the potential to serve as conduits of general emotional support and information. However, according to our findings, it is not these general support processes that drive recovery outcomes. Rather, the key factor appears to be activation of particular kinds of people for health discussion. This indicates that achieving a state of recovery may be facilitated by cultivating a social safety net that can provide targeted, health-related advice, affirmation, and instrumental aid that buoys the treatment process and permits gains in self-sufficiency and productivity”* (Perry & Pescosolido, 2015, p. 126).

In quantitative ego-centered network research, visualizations are usually dispensed with, since here several individual networks (in this example, 171 individual networks) would have to be visualized and the added value could be considered rather low. But there are two instances where it can be useful to visualize an ideal type of an ego-centered network. First, it can be helpful to convey a theoretical concept with the help of visualization. For instance, the egocentric network studies conducted by Bott (1955), Cornwell (2012), and Perry and Pescosolido (2012) are just some examples that depict ideal-type network visuals to emphasize their theoretical concepts. However, visualization can also be useful when several egocentric networks, that were collected and analyzed by the researcher, can be reduced to a few ideal types of networks and then presented visually. For example, Wellman (1988) formed an ideal type of an ego-centered network based on his network-collected data and several egocentric networks. The situation is different in visual or qualitative egocentric network research, which will be discussed later (see Sect. 2.2).

Therefore, whole and ego-centered network analyses differ. Although it is possible to isolate individual ego-centered networks from whole networks, these are always subnetworks from a predefined area defined by the researcher. Conversely,

the transformation from ego networks to whole networks is very difficult or even impossible. In the research process, researchers should therefore choose one of the two methods. This decision is essential, since both methods differ in terms of their respective data collection and, in some cases, in data analysis. This will be discussed in more detail later (see Sect. 2.2). The choice for one of the two procedures should be strongly oriented toward the research question and also take into account for access to the field.

If the research question is aimed at the internal networking of actors, such as the passing on of cigarettes by pupils in a school, the whole network analysis is the more appropriate tool. In the case of whole networks, the focus is on a group that can be easily isolated and its internal networking. If the focus is on the influence of friends on the drug use of homeless people, the egocentric network analysis would be more suitable. In this case, the “social border” is not clear, and not only can the internal cross-linking be interesting for the research, but also the relationships outside the group of homeless people. There are also differences in evaluation procedures. For example, not all statistical measurement methods are applicable to egocentric network analysis (see Sect. 2.2).

Thus, whenever the research interest is directed at the internal structure of a network and the connections between a predetermined number of actors are known or of interest, the whole network analysis is particularly well suited. Here, the researcher determines who belongs in the sample and who does not. The ego-centered network research is used when the relationships are not only to be analyzed between actors in a certain predefined space, but also when the interest goes beyond that. In this case, the focal ego is selected by a sampling procedure, but the persons (alters) of ego are not specified. The procedure is particularly suitable if one focuses on a specific group and wants to consider its general embedding in the social environment without having defined it beforehand.

2.2 Quantitative and Qualitative Network Analysis

In addition to the distinction between ego-centered and whole network analyses, a differentiation can also be made on the continuum between open/qualitative and standard/quantitative research. While social network analysis of the last 40 years was predominantly standardized and quantitative, less standardized research approaches for social network research (Freeman, 2004; Gamper, 2015) are now (again) more frequently discussed, and concepts of network analysis as method combinations of open and standardized approaches are presented (Dominguez & Hollstein, 2014; Gamper et al., 2012).

In standardized network research, the focus of interest is on so-called statistical structural descriptions or causal relationships, which include distribution properties of features, the testing of hypotheses and explanatory models, the discovery of correlations, and the development of alternative hypotheses and explanatory patterns. In contrast to classical research, in which attributes (e.g., age, gender) and their

interrelationships are examined, here relationship aspects are also included in the analysis or are even at the center of the research. Using structured and standardized data, structural measures such as network size, centrality, heterogeneity, and density are calculated (Wasserman & Faust, 1994). For better understanding, below I will briefly discuss some of the measures. A mathematical derivation is not given in this introduction. There are introductory books by Wasserman and Faust (1994), Knoke and Song (2019), or Newman (2018) that give a very good theoretical and statistical overview.

First of all, a distinction can be made between network parameters, that is, aspects that cover the entire network, and measures that affect the actors of a network, so-called actor parameters. For network-related measures, for example, the network size, density, or clique calculations can be given.³ The network size is probably the simplest measure. Here, the actors in a network are summed up. Density is the degree of connectivity of the network, which results from the connections of the individual actors with each other. The maximum density⁴ is reached at a value of 1, that is, when everyone is connected to everyone else in the network (Seidman, 1983; Wasserman & Faust, 1994). The value 0 is the minimum value and means that no relationships exist in a network. Elisabeth Bott (1953) distinguished between “tightly-knitted” and “loosely-knitted” networks, which refer to the networking of the network members between each other. In a tight network, many actors are interwoven with each other. It is assumed here that a high density can, for example, lead to strong control or that diseases (e.g., caused by viruses) can spread faster. The above-mentioned transmission of sexually transmitted infectious diseases in the Sexual and Romantic Network of Jefferson High School can be cited as an example (Bearman et al., 2004).

In addition to measures that relate to the entire network, there are also measures that relate to individual actors. So-called centrality or centralization measures⁵ examine the question of relevance of actors within a network. However, no agreement has yet been reached as to how *centrality is to be conceptually understood and measured*: “*There is certainly no unanimity on exactly what centrality is or on its conceptual foundations, and there is little agreement on the proper procedure for its measurement*” (Freeman, 1978, p. 217). Consequently, there are different forms and types of calculation of centrality (a critical review can be found in Landherr et al., 2010). Some focus on aspects like control, power, and prestige, while others concentrate on the flow of information and still others on the accessibility of people within a network. The simplest form is *degree centrality*. In this case, the most central actor is the actor with the most relationships within the network. In the case of *betweenness centrality*, the most central actor is the one who is on the shortest route between two vertexes in the network. In the case of *closeness centrality*, the most

³As mentioned above, many of these calculations are mainly applied to whole networks.

⁴It should be noted that network size and density may correlate with each other. See Anderson et al. (1999).

⁵These can also be calculated for the whole network.

central node is the one that has the shortest distances to all other nodes within a network. When calculating the *eigenvector centrality*, all actors are assigned a score on the basis of their respective interconnections in the network. The most central actor is the actor who has a lot of relationships with actors who also unite many relationships and are therefore very central (Wasserman & Faust, 1994).⁶

In addition to the distinction between network parameters and actor parameters, it is also possible to differentiate (ideally) between structure-describing methods and inferential statistics models that examine causal relationships. The structure-describing methods detail the structure of the network or focus on a few parts of the network. The so-called density method has already been presented. In addition, there are measures such as clique analysis, cluster analysis, component analysis, block model analysis, or the triad census. Clique, cluster, and component methods attempt to filter out subgraphs from a network whose internal density is higher than the density of the entire network (Luce, 1950; Moody & White, 2003). In this case, there are different procedures such as n-core, n-clan, and n-clique procedures (Mokken, 1979). For example, n-clique is a maximum subgraph in which the path distance, that is, the number of actors by which all nodes in the network are connected to each other, is not greater than a predetermined “value n” (Bron & Kerbosch, 1973). Thus, groups can be filtered out and distinguished hierarchically according to this calculated distance. The component method is similar. Components are subgraphs, that is, parts of a network consisting of nodes and are interwoven with each other. A strongly connected component is a group of nodes in which all nodes are connected by directed edges (for example, all actors in one part of the network lend each other cigarettes). In addition, there are also weak connected components, where each node is connected by exactly one path. For undirected networks where the direction of a relationship is not given (e.g., “Do you meet person XY occasionally?”), no strong or weak connected component can be calculated. In this case, there are just connected components (De Nooy et al., 2011, p. 77). Another explorative method, which is based on a data-reducing representation of nodes and edges, is the so-called “blockmodel analysis,” where actors and relationships to groups of actors and bundles of relationships are clustered (White et al., 1976) and thus form a reduced image of the network structure. Through clustering, hierarchies, center-periphery groupings, or even cliques can be visually presented and analyzed. A distinction is made here between a posteriori blockmodels, in which actors are grouped based on similar positions in the network, and a priori blockmodels, in which actors are grouped based on characteristics (Wasserman & Anderson, 1987). The statistical procedure of the “triad census” goes back to Heider (1958) (see also chapter “[Social Network Theories: An Overview](#)”). It examines how often closed triads—three actors directly connected to each other—occur in a network. In a directed network, 16 different triad types (isomorph classes) can be differentiated

⁶A broad overview of different centrality measures and their calculation can be found at the Periodic Table of Network Centrality (<http://schochastics.net/sna/periodic.html>). This website contains different measures of centrality and refers directly to the articles in which the measure is discussed.

Triad type (T_{ij})	Transitivity weight (w_{ij})	Triad type (T_{ij})	Transitivity weight (w_{ij})	Triad type (T_{ij})	Transitivity weight (w_{ij})	Triad type (T_{ij})	Transitivity weight (w_{ij})
	0		0		1		1
	0		0		0		0.5
	0		0		0		0.75
	0		0		1		0.75

Fig. 2 Triad census and the MAN scheme (mutual, asymmetric, null). Source: Shizuka and McDonald (2012, p. 934)

depending on the direction and type of relationship (Holland & Leinhardt, 1970). The labeling of the triad types is based on the MAN scheme: Mutual Dyads (i.e., reciprocal relationship), Asymmetric Dyads (i.e., one-sided relationship), and Null Dyads (i.e., no relationship). From the significantly reduced or increased presence of certain triad types, it is possible to draw conclusions about specific microstructural mechanisms in social networks, for example, whether a network is rather hierarchical or flatly structured. Figure 2 shows a complete triad count showing all 16 triad configurations. Here, the MAN scheme is applied. Seven triangle configurations, in which all three nodes are connected by either asymmetric or mutual edges, are shown in black. The weighting factor (w_u) for each of the seven triangle configurations is based on the probability that the triangle is transitive, assuming that each individual in a mutual dyad has the same probability of being dominant (a short introduction can be found in Faust, 2007).

Two stochastic methods that are implemented include *Exponential Random Graph Models* (ERGMs) and stochastic actor-oriented models (SAOM). ERGMs are stochastic models of empirical networks (Robins et al., 2007). They are used to test structural relationships with a few local parameters. A multivariate model can be created in which parameters such as reciprocity, transitivity, homophily, and centrality are tested for significance. Dependent variables are the edges, while the independent variables can be attributes (e.g., age, gender) as well as relationships (e.g., *strong* or *weak ties*). The basis of ERGMs is a Markov chain Monte Carlo estimation process that generates a sequence of random networks containing step-wise small changes of different parameters (a short introduction can be found in Robins et al., 2007 and van der Pol, 2019).

SAOMs, often carried out through RSIENA, were designed for modeling the dynamics of longitudinal network data (Snijders et al., 2010). In this statistical procedure, influence or/and selection effects (see chapter “[Social Network Theories: An Overview](#)”) are investigated and tested, in other words the extent to which

attributes have an effect on relations (selection), relations on relations (reciprocity), attributes on attributes (control variable), or relations on attributes (influence). The model is based on four assumptions: Actors have an influence on outgoing relationships, the change of relationships is done in so-called *microsteps* (actors have the possibility to dissolve, enter, or maintain a relationship), the change will be made in such a way that the change implies an increase in benefit for the actor (*rational choice approach*), and the benefit function includes a random component in addition to individual effects and their parameters (*objective function*) (a short nontechnical introduction can be found in Steglich et al., 2006).

It should be noted that not all measures for ego-centered and whole networks are applied in the same way. For example, the different measures of centrality are only applicable to a large number of actors within a network. Ego networks are often too small and do not have enough nodes within. Also, blockmodel analysis, in which clusters are formed against the background of the relationship structure, is not found in the ego-centered network analysis at all.

As an example of a quantitative network study, the *Framingham Heart Study* will be cited here. Starting in 1948, data were regularly collected in the city of Framingham in the USA to determine, for example, the causes and risks of heart disease and arteriosclerosis. Since 1983, network data have also been collected, which Fowler and Christakis (2008) have used to investigate the connection between “being happy” and being embedded in networks with the help of regression. In the process, 4739 persons were medically accompanied from 1983 to 2003. The results show that happy people are particularly at the center of the network, that is, they are central and form clusters (see Fig. 3): If you are surrounded by many happy people, you are very likely to be happy. More unhappy actors tend to be located on the periphery of the network. It is also shown that happy people in the network have a great influence on the feeling of happiness of ego and that this influence can spread over three edges (Fowler & Christakis, 2008).⁷

As a second example, a SIENA model is given here. Using longitudinal data, the smoking behavior of students in Finland was investigated. Mercken et al. (2010) investigated selection and influencing factors between pupils. They investigated to what extent smoking among friends is “socially contagious” (influence) or whether friendships develop due to interest in smoking (selection). They were also asked whether their own parents or siblings also smoke. It was found that both students chose their friends based on their smoking behavior. For girls, on the other hand, the smoking behavior in the “clique” also showed an influence factor. It was also evident that the smoking behavior of the parents had a significant influence. In contrast to the study by Fowler and Christakis (2008), no visualization was used here.

Qualitative network methods are rather underrepresented within network analysis in general and in health research in particular. In contrast to the quantitative approaches, the focus here is on understanding relationships or mechanisms and

⁷This and other articles by the authors are criticized. The critique includes the statistical models for example (Lyons, 2011).

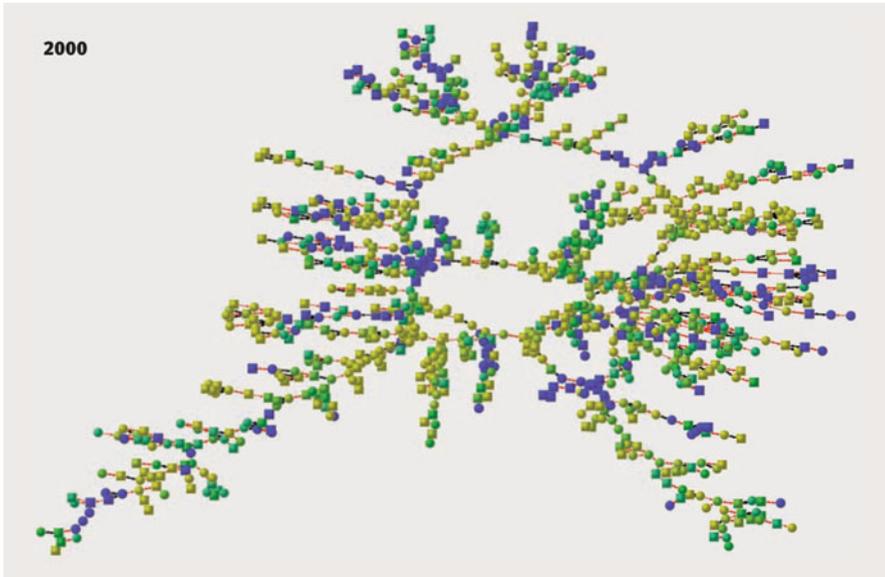


Fig. 3 The clustering of happy and less happy people in the city of Framingham. The lines between the nodes indicate the relationship (black for siblings and red for friends and spouses). The color of the nodes indicates the happiness of the ego, with blue shades meaning least happy, green a little happy, and yellow shades the happiest. Source: Fowler and Christakis (2008, p. 3)

the subjective view of the actors' networks. Mixed-method (Small, 2017) and qualitative SNA approaches have proved to be fruitful, especially by bridging personal and structural dimensions (Bernardi, 2011), exploring the contextualized nature of social relations (Bellotti, 2016; Molina et al., 2014), offering elaborated and nuanced differentiation of social relations to overcome categorizations (Sommer & Gamper, 2018), and detecting dynamics and temporal changes (Ryan et al., 2014). The interest lies in the stories behind the relationships, since according to White (1992) networks do not represent given realities, but are phenomenological constructs that are given meaning by the actors (see also chapter "[Social Network Theories: An Overview](#)"). The so-called "stories" (descriptions or interpretations of meaning), which make it possible to structure events in such a way that they function as part of a relationship history, which contains the subjective-social "meaning" of the relationship, are regarded here as the substrate of social networks. Thus, in order to be able to construct the emergence of networks or the dynamic change of networks, the stories of the persons and the possibilities for action in the respective context must be understood (White, 1992).

The theoretical discussion about a cultural or constructivist opening of network research (e.g., Emirbayer & Goodwin, 1994; White, 1992) goes hand in hand with the need for less standardized or qualitative-methodological approaches (Hollstein & Straus, 2006). The so-called visual network research (Gamper & Kronenwett, 2012; Gamper & Schönhuth, 2020), which is dominant in qualitative network research, is

presented here. Since the 1980s, so-called network maps and network drawings (Gamper & Schönhuth, 2020) have been used in data collection, which are used to collect subjective experiences and attitudes of the actors. The most open form of visual network research is the network drawing. Using a narrative stimulus, the respondent draws his or her individual network on a non-structured sheet of paper or reconstructs it with the help of a software program (e.g., VennMaker). In this way, internal network images are made visible without any concrete specifications by the researcher. The researcher carries out subjective attribution of meaning, whereby the evaluation takes place within the framework of a communicative validation. Through the interviews conducted, the statements and interpretations flow into the analysis (Herz et al., 2014; Molina et al., 2014).

Due to the openness of the network drawing and the interviews, a quantitative evaluation is not possible. On the other hand, network maps can be described as maps of social relationships, which individuals use to visualize their social networks. In contrast to network drawings, these contain structuring (e.g., the positioning of ego as well as age, or other attributes such as age and gender) and standardization (unification through value assignment). These attributes are more or less predetermined by the researchers and the interviewer's freedom is restricted. For this purpose, the network maps are partly or fully structured as well as semi-standardized or standardized by the researcher (Gamper & Schönhuth, 2020; Hollstein & Pfeffer, 2010). The pre-structuring can turn out differently. Popular forms include concentric circles (see Fig. 4) or sectors. If the specifications such as the concentric circles around the ego or the sectors are not assigned any discrete attribute values, this is structuring but not standardization (e.g., the social convoy model: Kahn & Antonucci, 1980). In the case of partial or full standardization, these visual items are assigned characteristic values in part or in their total number. The concentric circles that structure the proximity (which can be defined as importance, accessibility, etc.) to the ego can therefore be assigned the values "very important," "important," and "less important" to reflect the importance of the alters for the ego. The increase in structuring and standardization is accompanied by the loss of subjective assignment by the interviewee. However, the standardized data obtained can be evaluated using quantitative methods (Gamper & Schönhuth, 2020). The visual survey can be carried out using a paper-and-pencil method; paper, pens, and building block methods; or even a computer program (e.g., VennMaker), each of which has different advantages and disadvantages (Gamper et al., 2012). In addition, the visual survey method can be used in group or individual interviews. With regard to the qualitative evaluation, the focus can be on both the interviews conducted and the results of the different network maps or even drawings. Here, statements from the interviews can be related to the visualizations by first analyzing the interviews and then, in a second step, by investigating and relating the visualizations. Another possibility is to start from the maps or drawings and only then to use the interviews for the analysis. Which of the two approaches is chosen depends strongly on the research question and the data material, such as the focus of the survey (more visual or interview-based) and therefore cannot be answered in a generalized way.

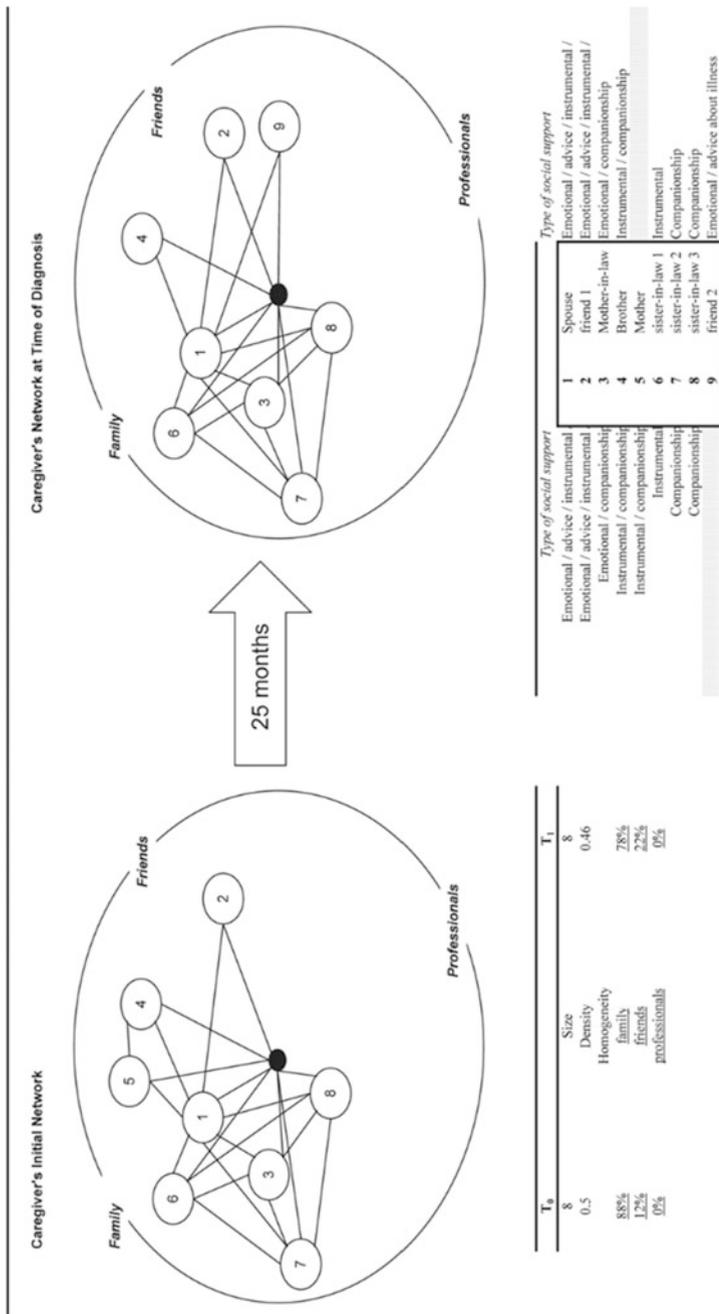


Fig. 4 Caregiver's Social Network Transformation. Source: Carpentier and Ducharme (2005, p. 297)

Qualitative methods of network research thus focus on mechanisms, behavior, or even individual interpretation and thus reveal, for example, action and thought processes.

Two examples, a mixed-method and a qualitative research study, will be presented. The first study deals with support networks for caregivers of persons with dementia. The mixed-methods approach combines the social network analysis with narrative analysis. The name generator is based on eight questions. These questions are providing the caregiver an emotional, informational, instrumental, and social support network (see Fig. 4).

The caregiver is asked to provide up to five names for each question. These actors can be family members, friends, neighbors, coworkers, volunteers, or professionals (Carpentier & Ducharme, 2005, p. 294). With the aim of the quantitative network analysis, differences between T_0 and T_1 networks are analyzed in relation to size, density, and homophily, since the caregiver began his or her career. With the help of the narrative method, four goals were addressed. The first involves identifying the actors named in the narration, including support actors, identified by the name generator, but also other actors who have participated in decisions or influenced the course of social relationships. A second phase involves identifying events of the narration. The goal was to produce a collection incorporating the events deemed essential to understand the network transformation process. Third, a temporal map incorporating the actors and events was produced. A diagram was used to analyze when the support relationship started or ended. With the interpretation, the last step, the mechanisms linked to motivations, intentions, and actions over time should be interpreted. *“Social policy intended to maintain older persons in the community is based on the establishment of support ties with various resources providing assistance, although very little information is currently available regarding the processes that create and maintain support ties for caregivers”* (Carpentier & Ducharme, 2005, p. 308).

The second example is a qualitative psychology or psychotherapy research project in the field of intervention studies. This research deals with the effects of network relationships on mental well-being in Germany. Using three case studies, Silvia Weigl (2016) shows how network maps are used to visualize and reflect on the effects of relationships on the well-being of the subjects. Figure 5 shows a network map in which a respondent has presented his or her own relationships and rated them as positive, negative, or ambivalent (for the meaning of negative relationships, see chapter [“Negative Ties and Inequalities in Health”](#)). In addition to the drawing, the clients are also asked about their relationships, which are visualized in network maps. In the therapy sessions, these relationships are discussed, placed in the life phase context, and their influence on well-being is reflected.

The results of the network maps and the subsequent networking of the people to be advised are assessed as positive. The use of network maps makes clear the life situation of the respondents and the importance of the own person in the social network. This increases the self-esteem as well as the perceived self-efficacy. Furthermore, a stabilization of the own position is achieved. There are also different forms of networking by the persons concerned themselves, in which relationships in

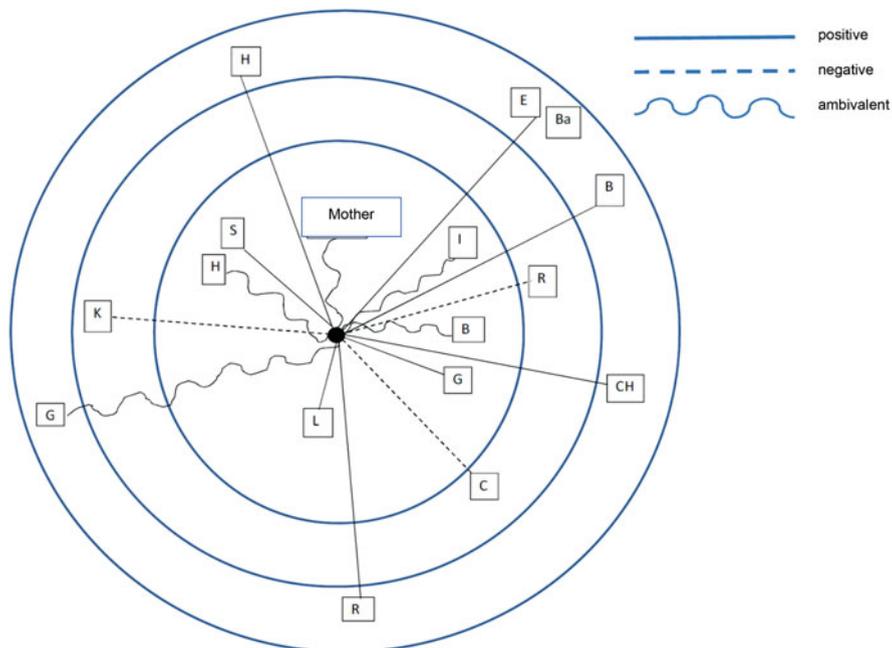


Fig. 5 Network map of a patient at the beginning of therapy. Source: Weigl (2016, p. 238) (translated in English)

the network are worked on in a targeted and active way, as well as a relativization of idealized and derogatory views of social relationships in the past. As the example shows, networks thus not only serve as scientific analysis tools, but also offer instruments for intervention in the health sector under the keyword “network work.”

3 Conclusion

This chapter defined the concept of the network and presented the different approaches and procedures of network research and analysis. The method to be used for a particular question was shown by using examples from the field of health research. Networks are associations of persons, institutions, and collective actors—the so-called nodes—which are interwoven by relationships (e.g., sexual relationship, love)—referred to as the edges. It is assumed that the embedding of the actors has consequences for them or that certain actions of the actors affect the relationships within a network.

During the analysis, two main distinctions were identified. Against the background of the structure of the network, a distinction can be made between whole networks and ego-centered networks. The whole network analysis focuses on the

internal structure of persons within a predefined area. This can include, for example, pupils in a school class or people in a city. Here, only the relationships among each other are recorded. In ego-centered network research, the interest lies in the embedding of the individual in his or her social environment. Here, ego is asked about their relationships and the persons (alters) and their attributes in their personal network. If the research interest is focused on the internal structure of a group and the boundaries are clearly given from the inside, then a whole network analysis is particularly well suited. The egocentric network research has its advantages when persons of a certain group (e.g., drug addicts, the elderly) and their general embedding, also in comparison with other groups, are to be examined. Besides the methodological dimension, a distinction can also be made between quantitative and qualitative network research. Standardized network research can be differentiated between structure-describing methods and methods for analyzing causal relationships. The structure-describing methods describe the network, including, for example, the size of a network or its density. Stochastic methods, such as exponential random graph models (ERGMs) and actor-oriented models (SAOMs), try to uncover random relationships. Both alignments can cover the entire network (e.g., density, network size) or individual nodes or edges (e.g., centrality measures).

Regarding qualitative network research, different visual methods were presented. A distinction was made between network drawings and network maps. Network drawings are free visualizations, which do not include any pre-structuring by the researcher. With network maps, specifications such as concentric circles are made. Structures can also be standardized by assigning values. This also makes it possible to evaluate the data quantitatively, whereas this is not possible with network drawings. For the coupling of interviews and the visualizations, there are hardly any scientific handouts or standard works. Qualitative research should be resorted to if the focus is more on idiographic constructs such as patterns of interpretation, structures of meaning, or subjective perceptions of networks and relationships. Even with phenomena that are unknown, little known, or researched, qualitative instruments are more suitable because of their thematic openness. Quite often, hypotheses for quantitative network research are generated in qualitative studies. For causal connections or when representative statements are to be made, the different quantitative methods are suitable. It is important here that the survey methods must be adapted to the research field and the research question. Particularly in health research, there is no uniform procedure for name generators, for example, and thus, there is still a lot of room for ideas.

Due to the few studies that exist in the area of network research and health inequalities, tested actor generators or other preliminary work, including in the qualitative area, are very rare. Therefore, research questions have to be constructed and tested. This makes it necessary, for example, to develop one's own actor generators or to adapt already tested questions to one's own research. It is central to adapt one's own questions, both qualitatively and quantitatively, to the theoretical concepts (see also chapter "[Social Network Theories: An Overview](#)"). Paradigms such as social support, diffusion research, and social capital, which can be well combined with health issues and networks, are particularly suitable here. Limits are

generally apparent with regard to the duration of the surveys. Qualitative and quantitative methods of network research are very time-consuming and take up a lot of space in the survey. Therefore, it should be considered in advance what role networks play in answering the research question on health inequalities. Building on this, the part of the network analysis should be tested in order to be able to estimate the duration of the survey. As the few studies show, a connection between health and networks is of great importance in many fields (e.g., transmission of diseases, health behavior) and should be considered much more strongly, but also methodologically.

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Social Networks, Family Social Capital, and Child Health



Daniel Lois

Overview

- Social networks for children consist in the inner circle mainly of members of the core family (parents, siblings) and in the extended circle of other family members such as grandparents and friends. Network size and the proportion of friends in the network increase with age.
- A literature review shows that child health is influenced directly by the child's social network as well as indirectly by the social network of the parents.
- Of the various theoretical mechanisms that can be used to explain these findings—for example, social support, social contagion, or social control—the support mechanism is best empirically confirmed. However, “real” network studies, in which family networks are established on the basis of names, are rather rare in the age range considered here.
- Family social capital correlates positively with the socioeconomic resources of parents in Western industrialized countries. In emerging and developing countries, it is apparent that children's health is increasingly dependent on the availability of social support.

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1 Introduction

Since the late 1980s, when the so-called salutogenesis model became established, researchers and practitioners in the field of health promotion have been looking not only for factors that cause illness, but also for factors and dynamic interactions that lead to the development and maintenance of health. Social relationships are considered helpful and supportive in this context. Their improvement is one of the goals of health promotion.

This article deals with the family as a core area of social relationships and also looks at the physical and mental health of children (up to 13 years of age). Family influences on children's health are manifold (cf. Rattay et al., 2012): From early childhood to adolescence, children learn how to deal with their bodies, health, illness, and coping strategies in the family. In everyday interaction in the family and through the social contexts to which the family provides access, children and adolescents acquire basic knowledge and attitudes that contribute to their development in psychological, physical, social, and cognitive terms. According to Rattay et al. (2012, p. 146), health-related socialization takes place in particular through everyday family practices such as the organization of meals, physical activity, and leisure behavior in the family, fixed times of day for getting up and going to bed, use of medical services, and family attitudes, for example, regarding hygiene. But adolescents are also more or less directly exposed to harmful practices such as the consumption of tobacco and alcohol in their families.

Research distinguishes between protective factors of family and risk factors. Risk factors include, for example, unfavorable material conditions, parents' low level of education, unemployment, cramped housing conditions, family conflicts, physical or mental illness of one parent, poor availability of primary caregivers in early childhood, neglect, or violence (Tiber Egle et al., 2002).

This paper is a literature review that focuses on protective social factors that influence child health. It focuses on (1) direct influences of the child's social network, for example, social support by parents, and (2) indirect influences of the parental network on the child, for example, in the form of emotional or instrumental support of parents by grandparents.

First, Sect. 2 discusses how children's social networks are composed, which functions they theoretically fulfill and which effects on health they might have. The concept of "family social capital," which goes back to James Coleman, is integrated into the discussion. Section 3 then briefly discusses, as a starting point, studies that use the socioeconomic status of the family as a predictor of the child's health status. On this basis, Sect. 4 will provide a literature review of network effects, which will be examined again in Sect. 5, in particular regarding the extent to which they occur independently of classical dimensions of inequality and how they are linked to these dimensions. In Sect. 6, a concluding discussion of the findings will follow.

2 Children's Networks: Structure, Functions, and Effects on Health and Family Social Capital

2.1 Structures, Functions, and Health Effects of Social Networks of Children

Nestmann and Wehner (2008, p. 22–27), building on Vaux (1988), describe the spectrum in which social networks can influence the health of children. They take a developmental psychological perspective. According to the attachment theory (Bowlby, 1975), a secure foothold and a trustful relationship with the closest caregivers enable the infant to explore new social relationships and spheres of life. Beyond the mother–child relationship, however, attention should be paid at an early age to a possible network perspective that takes up the influences of so-called exosystems (Bronfenbrenner, 1981) in addition to other persons in contact with the infants (e.g., fathers, siblings, grandparents, caretakers). This means that persons and institutions indirectly affect children through their closest caregivers. In addition to the social networks of the children themselves, the networks of the parents must therefore also be included in the analysis (cf. Cochran & Brassard, 1979).

In direct contact with parents' network members, the children receive various cognitive and social stimuli that affect their development: different interaction styles and forms of attention, divergent interaction content (e.g., talking, playing, reading aloud), and other interaction settings (e.g., the grandparents' household). In addition to these suggestions, the children experience other forms of support and regulation. Members of the parental network also serve as behavioral models (social learning) and offer the children interaction opportunities that strengthen their social competence.

Persons from the parents' network, such as grandparents, friends, or neighbors, can indirectly influence the children in various ways: They give the parents explicit or implicit feedback on child care and upbringing, support them in parenting and care (e.g., in emergencies and illness), emotionally confirm the parents in their role as parents, and provide support. In addition, network persons represent learning models that provide access to a wider range of interaction styles, strategies for everyday management, or conflict resolution skills. In addition to the positive impulses listed, however, negative influences such as unsolicited advice, contradictory guidelines, or negative examples of behavior must also be considered.

From this, we can already deduce some central mechanisms by which social networks of the child itself or parental networks influence the child's health (for theoretical mechanisms, see chapter "[Social Relations, Social Capital, and Social Networks: A Conceptual Classification](#)" as well as chapter "[Social Network Mechanisms](#)"). Heuristically, four aspects can be differentiated:

- *Social support*: Erhart and Ravens-Sieberer (2008) distinguish between a shielding, buffering, and tolerance effect regarding social support. Emotional or instrumental support prevents crisis situations (shielding effect), can reduce negative effects in crisis situations by the development of coping strategies

(buffering effect), and strengthens abilities to deal with health disorders that have already occurred (tolerance effect). Examples of the shielding effect would be the warm dressing of the child in winter or a vitamin-rich diet. If network members strengthen the self-esteem and coping optimism in stressful situations, for example, when the child is stressed at school, this would be an example of the buffer effect. When network members emotionally support a sick child, this is an example of the tolerance effect.

- *Social control*: In families with a high degree of cohesion, parents and also persons from the parents' network (e.g., grandparents) are more likely to keep children away from "risk-fashion" activities or behavior that is harmful to health through (informal) social control. With high cohesion, the child's state of health can also be better monitored and, if necessary, reacted to ("monitoring").
- *Social influence*: In families with a high degree of cohesion, parents are more likely to have the opportunity, for example, to actively influence the children's eating habits through regular meals together and promote knowledge about healthy eating. The same applies to physical activity (e.g., sports) or media consumption. Close family social relationships also promote social community and a positive mood. This avoids negative isolation effects such as depression or neglect of diet or self-care.
- *Social contagion*: The parents themselves, but also persons from the parents' social network, firstly represent models of behavior for children and adolescents whose attitudes and behavior can be adopted in the context of social learning (Bandura, 1977). Secondly, an indirect mechanism is that caregivers of the child selectively establish or maintain relationships with network persons who have similar attitudes and behaviors in the area of health as themselves (homophilia; Kennedy-Hendricks et al., 2015).

In the next step, the question arises as to which persons from the child's network or the parental network take over what functions and whether there are differences, depending on the child's age. Regarding the structure of child networks, Levitt et al. (1993), following Kahn and Antonucci (1980), use the metaphor of the caravan, an ideal type of structural network development over the course of a child's life. According to this metaphor, a small convoy of the closest family first travels through early childhood, then quickly enriches itself through kinship, friendship, and neighborhood, and enlarges in late childhood or adolescence when peers and first institutional contacts (kindergarten, school) join in. Building on this "convoy model," Levitt et al. (1993) use concentric pie charts to delineate network persons of the children (here between 7 and 14 years of age) who form the innermost circle of the network (greatest importance for the child and proximity to the child) or the middle and outer circle. The innermost circle consists almost exclusively of close family members (parents, siblings) or other family members such as grandparents. The middle circle is heterogeneous (family members outside the nuclear family predominant, but friends are also gaining in importance), and in the outer circle, friends are the largest group. With the age of the children, the size of the network, the proportion of friends, and the perceived potential for social support (especially through friends) increase in the network (see also Bost et al., 2004).

In a study of social networks of children aged 4–8 years, Boosman et al. (2002) show how the various network persons carry out different network influences (social control, social support, and childcare). As expected, it turns out that all three functions are generally fulfilled most frequently by parents. If, however, a subdivision is made according to types of support, a more differentiated picture emerges: Peers most often provide support that manifests itself in the form of sociability and opportunities to play. Conflicts are also more often carried out with peers rather than parents. Grandparents are structurally like parents, but at a lower level. In other words, they exercise social control relatively often, are strongly responsible for childcare (e.g., eating, dressing), and offer emotional as well as instrumental support. Following parents and peers, siblings also play an important role in the area of sociability. However, the level of conflict with siblings is lower than with peers. Teachers are somewhat surprisingly rarely named as significant influencers, even in the area of “informational support.” Finally, children also classify cuddly toys and dolls as symbolic network persons in some places, for example, in the area of emotional support.

Only rarely is it discussed in the literature what properties individual *ties* or the network as a whole must have in order for the mechanisms discussed above to work. Erhart and Ravens-Sieberer (2008) indicate that the shielding, buffering, and the tolerance effect of social support are particularly effective when, on the one hand, several supporters are available and, on the other hand, support is long-term in scope. Similarly, in a Mexican study Kana'iaupuni et al. (2005) expect that social networks containing either a high proportion of blood relatives (parents and siblings) or a high proportion of “extended kin” can provide more social support or a particularly intensive form of support. The term “extended kin” includes persons of trust in a culturally anchored reciprocal support system as well as godparents of the children. It is also expected that physical proximity, residence, and a high frequency of contact will have a positive effect on the support potential. Thus, it can be cautiously assumed that dense networks with a high proportion of relatives, which accordingly consist mainly of *strong ties*, should be particularly beneficial to children's health. This differs from adolescents in whom weak ties increasingly gain importance (see, for example, Small, 2017 and Moor et al., in this volume).

2.2 *The Approach to the Family Social Capital of Children*

The concept of “family social capital,” which goes back to Coleman (1990), can also be linked to the network perspective discussed, but at the same time it is broader. Here, it is postulated that the family background of a child consists of three components: (1) financial capital (the financial resources available to the household as a whole and the child in particular), (2) parental human capital (e.g., parents' cognitive skills and educational attainment), and (3) social capital (the resources available in social relationships that are useful for the cognitive and social development of children and young people).

Social capital generally establishes a conceptual link between the characteristics of individual actors and their immediate social contexts in the home, school, and neighborhood and, thus, in non-family network relationships. Intra-familial social capital refers to the parent–child relationship and manifests itself through the time and attention parents devote to interacting with their children, exercising social control, and promoting their well-being. Family social capital is operationalized in research on indicators that can be assigned to two main dimensions: (1) the structural dimension (family structure)—for example, the nuclear family (with two biological parents in the household) vs. stepfamily or single parents and number of siblings, or (2) the functional dimension (the existence of beneficial interactions between parents and children).

Critically, it can be argued that the concept of “family social capital” is defined too broadly.¹ Social capital includes family cohesion, the quality of the parent–child relationship (e.g., frequency of contact, emotional closeness), and structural aspects of the child’s or the parents’ network. The latter includes, for example, network size, density, and centrality (Alvarez et al., 2017).

Alvarez et al. (2017) have prepared an overview based on a literature review, which is shown in Table 1. The areas of family cohesion and family support can be understood as differentiations of the functional dimension according to Coleman (1990) and the construct of the family network as a representation of the structural dimension.

The concept of social cohesion is more presuppositional than the concept of social capital, and it is described, especially in family psychology, as a central criterion of family functioning (e.g., Dilworth-Anderson et al., 2005). It is thus possible that despite a pronounced social capital, there is no social cohesion. Conversely, the absence of social capital seems difficult to conceive with given social cohesion.

3 Social Inequality and Child Health

An extensive literature is devoted to the connection between social inequality and (childhood) health. It is based on the concept of socioeconomic status, that is, the individual’s position in a society characterized by inequality in the distribution of

¹Coleman’s concept of family social capital (1990) and the operationalization of the concept in research have been criticized in several respects (Alvarez et al., 2017; Morrow, 1999). It has been argued that children and young people in particular are seen as mere beneficiaries of social capital, while how they themselves contribute to its creation is overlooked (Morrow, 1999). It should also be critically noted that the concept of “(family) social capital” is blurred by the multitude of concepts it combines. It covers both structural aspects (e.g., the family form) and concrete support services from the network to feelings of belonging, patterns of interaction, or the emotional closeness between parents and children (Morrow, 1999). Here, the conceptual delimitation to other, sometimes more selective terms such as lifestyle, is missing (Wippermann, 2009).

Table 1 Concepts for measuring family social capital

Construct	Substructure	Example items
Familial cohesion	Collective effectiveness	Perception to function well as a family.
	Informal control	How many hours are children at home after school without parents? Do parents know the child’s friends? Do parents allow the child to go out with friends unknown to them? Do parents check if children have done their homework?
	Social Interaction	Frequency of joint parent–child activities such as meals, games, conversations, and celebrations.
Familial support	Sense of membership	Do family members respect each other? Do they feel mutual loyalty and trust?
	Emotional support	Do family members talk about concerns? Are relatives reliable people who help with serious problems? Are family members given emotional support, empathy, and love?
	Instrumental Support	Parents help with homework.
	Conflict	How often do family members criticize each other? Do personal goals conflict with those of the family?
Social network (of the child or parents)	Network structure	Network size, density, and centrality; Gender and age composition; Scope of the family network (parents, siblings, parents-in-law, other relatives).
	Relationship quality	Proximity of residence and frequency of contact and emotional closeness.

Source: Own presentation based on Alvarez et al. (2017, p. 19)

privileges and wealth. This is accompanied by advantages and disadvantages regarding the availability of various goods. These include, on the one hand, classical goods such as income, wealth, power, social prestige, education, or knowledge and, on the other hand—as in the concept of social status (Hradil, 1987)—socio-cultural participation in the areas of work, education, housing, leisure, and culture.

In a multi-level model, Lampert and Schenk (2004) systematize various theoretical approaches to explaining the connection between social inequality and child health. According to this model, the social situation of the household, measured, for example, by class affiliation, income situation, and family form (single parents), is related to living conditions and opportunities for participation. This includes, for example, material provision, family situation, housing conditions, leisure time behavior, and the composition of the peers as well as the chosen school or daycare center. Living conditions and opportunities for participation in turn have an impact on health behavior (e.g., diet, physical activity, alcohol and tobacco consumption, oral hygiene) and on the personality, which is expressed, for example, through

self-esteem, control convictions, optimism, or aggressiveness. Health behavior and personality, which are also mutually dependent, ultimately lead to health inequalities, which manifest themselves in diseases, disabilities, accident injuries, subjective and mental health, or behavioral disorders.

Numerous empirical studies show that there are links between social and health inequalities among children and adolescents. The corresponding results are briefly summarized here based on the research overview by Lampert and Richter (2009), parts of which have been updated:

- *Infant mortality*: The empirical evidence to date, which is limited to regional data, shows increased infant mortality in lower social classes. This also applies to risk factors such as lower birthweight and congenital malformations (Mielck, 1998).
- *Developmental disabilities*: According to annual school entry examinations by the Public Health Service (see for the state of Brandenburg: Ellsäßer & Lüdecke, 2015), developmental disorders are significantly more frequent in children with a low social status (measured by the education and employment status of the parents). While, for example, speech and language disorders were diagnosed in 43.9% of cases among children with a low social status, the figure was only 13.2% among children with a high social status. Similarly, large differences are also found, for example, in perceptual and psychomotor disorders, intellectual developmental delays, emotional and social disorders, and psychological abnormalities. One reason for this may be that socially disadvantaged population groups make less use of the so-called German U screenings (developmental checkups for babies and children) (Ellsäßer & Lüdecke, 2015).
- *Chronic diseases*: Chronic diseases in children also show a social gradient: According to the findings of the Brandenburg school enrollment survey of 2015 (Ellsäßer & Lüdecke, 2015), children with low social status are chronically ill in 23.7% of cases. Examples are somatic illnesses (e.g., speech, vision, or hearing disorders) or mental illnesses such as ADHS and emotional social disorders. This proportion is significantly lower with high social status at 9.5%.
- *Accidental injuries*: Data on accidents at school, daycare, at home, during leisure time, and in road traffic were examined sporadically regarding connections with the social situation. An older study by Geyer and Peter (1998) shows that children of unskilled and semi-skilled workers as well as of skilled workers are more often treated in hospital due to accidents than children of employees and persons in higher occupational groups.
- *Psychosocial health*: Findings based on the “Health Behaviour in School-aged Children” (HBSC) study (e.g., Richter et al., 2008) show that children and adolescents aged 11–15 years have a better subjective health with increasing family wealth. Similar social differences are also reported for psychosomatic complaints such as headaches, stomach and back pain, sleep disorders, or issues related to emotional well-being.
- *Health behavior*: Also, on the basis of the HBSC studies, status-dependent differences, for example, in nutrition (children from socially disadvantaged families eat fresh fruit and vegetables less often), as well as differences in the

frequency of tobacco and alcohol consumption, which decreases with social status, can be shown.

Lampert and Richter (2009) sum up that although social status is operationalized very differently in the research landscape (e.g., through the education and occupational status of parents, but also through the prosperity of the family), the various status indicators largely correspond in their effects. They conclude that there is a comparatively close connection between the social and health situation of adolescents (see also chapter “[Social Networks and Health Inequalities in Young and Middle Adulthood](#)”). It is of particular interest to investigate the extent to which both network effects and inequality effects are related. It is conceivable, for example, that the negative effects of a low level of socioeconomic resources are weaker if the family has compensators in the form of social support.

4 Social Networks, Family Social Capital, and Children’s Health: A Literature Review

When reviewing the state of research, a conceptual distinction is made between two perspectives:

1. How is the health status of children influenced by members of their immediate family network (Sect. 4.1)?
2. What influence do parents’ social networks indirectly exert on children’s health (Sect. 4.2)?

4.1 Child Networks and Children’s Health

In this section, the first step is to focus on studies that look at the effects of the child’s social network on his or her health and also use a network methodology in the narrower sense, that is, by constructing ego-centric networks. This criterion is met by the two developmental psychological studies by Levitt et al. (1993, 2005). Secondly, the state of research is briefly summarized for studies that use the broader concept of “family social capital” (Bala-Brusilow, 2010; Berntsson et al., 2007; Erhart & Ravens-Sieberer, 2008; Eriksson et al., 2012; Klocke, 2004; Klocke & Lipsmeier, 2008; Lau & Li, 2011; Morgan & Haglund, 2009; Rattay et al., 2012; Wu et al., 2010). These studies are also largely discussed in a recent literature review by Alvarez et al. (2017).

Levitt et al. (1993), based on a sample of $N = 333$ American schoolchildren aged 7–14 years, examine how affective-emotional and instrumental social support in general, and social support from the innermost circle of the child’s network in

particular (“convoy model,” see Sect. 2.1), have an impact on two aspects of mental health: the positive self-concept and an index of the child’s general mood and sociability. Social support from the social network as a whole, but in particular from the innermost circle, which consists mainly of members of the nuclear family (parents, siblings), has medium positive effects on both health factors.

In a more recent study (also with school children ages 9–13), Levitt et al. (2005) extend these findings by a typological approach. A cluster analysis shows that there are three structural types of child networks: a type in which social support is given from members of the nuclear family and from close friends (“close family/friend”), a type with support exclusively from the family (“close family”), and a type with diverse support from the nuclear family, the extended family and friends (“close/extended family”). Again, the positive self-concept, loneliness, and internalized as well as externalized behavioral problems (e.g., feelings of worthlessness, physical violence) are used to investigate aspects of “psychological adjustment.” The findings show that children’s self-concept is most positive, and loneliness is least pronounced when their social networks provide support from several sides—either from close family members and friends or from members of the close and extended family (e.g., uncles, aunts, cousins).

In the studies that can be subsumed under the term “family social capital,” family social capital is not recorded via name-based network indicators (as in the aforementioned studies), but via so-called global indicators. Here are two examples: Erhart and Ravens-Sieberer (2008) cover the structural dimension according to Coleman through the family form (nuclear family, stepfamily, single parents) and the functional dimension through emotional support by (step-)parents and older siblings and instrumental support by parents in school. Morgan and Haglund (2009) operationalize family social capital—following the cohesion approach—on the one hand through common activities in the family, for example, sitting together and talking or visiting friends, and on the other hand through the extent of social control by parents (“How often does your mother or father try to control everything you do?”).

The health indicators show a broad spectrum. They cover psychological and psychosomatic aspects (e.g., life satisfaction, pressure to perform at school, nervous stomach problems), health-related behavior (e.g., physical activity, brushing teeth, family meals, television consumption, fruit and vegetable consumption, tobacco and alcohol consumption), physical health (injuries, obesity), and global indicators on general health.

Methodologically, the effects of social capital indicators on health indicators are usually determined within the framework of hierarchical regression models, which are estimated without and with the control of socioeconomic variables such as education, occupational prestige, and parental income. The results of these analyses lead to the conclusion that the social capital approach in general has great potential to explain children’s health. It is shown very consistently that almost all social capital indicators have a positive influence on health indicators in the expected way, mostly when socioeconomic status is controlled.

Two studies are particularly noteworthy. The work of Rattay et al. (2012) is instructive in that it tests—made possible by a relatively large number of cases—whether the effects of social capital indicators on children’s health depend on the age of the child or adolescent, with five age groups being considered (0–2 years, 3–6 years, 7–10 years, 11–13 years, 14–17 years). For example, a family climate scale that measures family cohesion has explanatory power across ages and genders: Children and adolescents are consistently rated as significantly healthier when the family climate is better. In contrast, one or more siblings only have a negative effect on the general health of boys in the age range 0–2 years, whereas no effects are observed for older children and for girls.

A special feature of the study by Wu et al. (2010) is that, within the framework of structural equation models, family social capital is analytically embedded as a mediator in an explanatory chain. Exogenous variables at the beginning of this chain are family human capital (parental education) and family income. Mediators or intervening variables are the family social capital (positive family interaction, social control, and monitoring) and the “community social capital” (e.g., neighborhood subjectively perceived as safe, number of friends in the neighborhood). Depression among children is the outcome variable. Path analyses show that family human capital has a direct negative influence on depression and an indirect negative influence, since a high level of education among parents leads to more family social capital, which in turn has a negative effect on the children’s depression. In addition, higher social capital in the neighborhood also leads to more pronounced family social capital and thus to lower depressiveness.

4.2 Parental Social Networks, Family Social Capital, and Children’s Health

The literature search resulted in four studies that look at indirect effects of parental social networks. These can be arranged as follows: Runyan et al. (1998) base their analyses on a sample of extreme cases drawn by special screening techniques. The studies by Adams et al. (2002), Kennedy-Hendricks et al. (2015), and Kana’iaupuni et al. (2005) are also characterized by the fact that a network methodology in the narrower sense (name-based, ego-centered networks) is used. Furthermore, Adams et al. (2002) and Kana’iaupuni et al. (2005) are studies that were not conducted in Western industrialized countries (Mali, Mexico). In all four cases, therefore, a somewhat more detailed discussion seems appropriate.

Runyan et al. (1998) use a sample (Longitudinal Studies on Child Abuse and Neglect, LONGSCAN) in which children who have been exposed to particular health risks since birth are overrepresented. Criteria for this include low birthweight, a single parent without family support, the young age of the mother at birth, the mother’s alcohol or substance abuse, maltreatment, or growth disorders. Child well-being is measured by indicators of developmental or behavioral problems: anxiety,

depression, physical complaints, social problems, concentration and sleep problems, rule-breaking and aggressive behavior, and motor, adaptive, linguistic, and cognitive skills. In a case-control study, children who are classified as clinically “abnormal” on this basis are compared with inconspicuous children. The children are on average 4.5 years old.

According to Coleman (1990), social capital is measured firstly by the structural dimension (the presence of two parents in the household as well as the number of siblings). However, seven global indicators are used to measure the extent to which the child’s primary caregiver has functional and emotional support from their social network (examples: Ego knows people with whom he can talk about problems, receives invitations to go out with others, receives love and affection, receives advice on important aspects of life, is supported in his own illness, knows people who care about how he is doing). The form of social support measured in this way is considered individually and added to other social capital indicators (two parents in the household, a maximum of two children, social support from the neighborhood, regular attendance at church) to form a total score, or a “Social Capital Index.” Advanced network measures are not reported.

Empirically, it has been shown that the personal social support of parents is significantly weaker in children classified as conspicuous than in inconspicuous children. The same applies to regular church attendance and the social capital index as a whole. The structural indicators (two parents in the household, no more than two children) do not exert any significant influence bivariate. The positive effect of the social capital index on child development and health remains stable even in a logistic regression model that controls for mother education, family income, and maternal depression.

Kennedy-Hendricks et al. (2015) is the only study discussed here that aims at processes of social contagion. The sample is based on rather disadvantaged families in the context of social housing. A survey of name-based ego-centric social networks of parents is used to examine the extent to which the network persons (especially in the neighborhood) represent positive behavioral models for the children in connection with health aspects, for example, by eating a health-conscious diet, being physically active, or not being overweight. Empirically, it has been shown that children themselves are more active in sports and less likely to be overweight if there are many physically active and non-overweight persons in the parents’ networks. These results support the assumed social learning and contagion processes, even if they are not directly tested.

Kana’iaupuni et al. (2005) use data from the Health and Migration Survey (HBS) for some selected Mexican villages ($N = 620$) to show that the extent of emotional and financial support for parents from their network members increases less with the number of blood relatives than with the number of persons (in close spatial proximity) who are considered extended relatives. These include the above-mentioned confidants and godparents of the children. Highly interactive social networks of this nature, mediated by emotional and financial support, also have an expected positive effect on the children’s general health, especially in families with few material resources.

Adams et al. (2002) survey N = 1008 mothers in Mali from two tribes (Bamanan, Fulbe). A name generator is used to determine the size of specific social subnetworks that provide material, practical, cognitive, and emotional support for the mother. In addition, various network characteristics are recorded in relative detail: gender and age composition, the spatial proximity of the network members, and the relationship status with the mother (relatives, friends). Using a Cox regression, the mortality risk of the child in the first five years of life is estimated. The child's mortality probability decreases significantly as the size of the network increases and as the number of persons providing practical, cognitive, and emotional support increases. This is particularly true for the Fulbe population, which is particularly affected by poverty. The different structural network characteristics (e.g., percentage of relatives, percentage of network members living in the household) are multivariate insignificant.

5 Family Social Capital, Children's Health, and Social Inequality

In the next step, family social capital and children's health are associated with social inequality by briefly evaluating the studies referred to from this perspective. Two questions are at stake:

1. Does a low socioeconomic status of parents, mediated by a low level of family social capital, lead to poorer child health?²
2. Is there an interaction effect between socioeconomic status and family social capital in predicting child health? Does a high level of social capital therefore have a different effect on health depending on social class?

Regarding the first question, it should first be noted that, particularly in sociological studies from the field of family social capital research, multivariate models are calculated in which both social capital indicators and characteristics of the socioeconomic situation (education, income, and employment status of parents) are represented. In general, the findings make it clear that family social capital retains its independent explanatory power even when socioeconomic indicators are controlled. Therefore, social capital is not merely a function of the socioeconomic situation, but has independent effects.

At the same time, those studies that use either hierarchical regression models or, as Wu et al. (2010) use, structural equation models, show that family social capital is dependent both on other social capital subdimensions (school, neighborhood) and on the family's socioeconomic status. Wu et al. (2010) differentiate this dependency in that families with a high level of parental education in particular have more social

²For a detailed theoretical discussion of the relationship between socioeconomic status and social capital, see Hartung (2013, p. 139–175).

capital (here, above all, family cohesion). These findings confirm the mediation hypothesis formulated in question 1.³

A general sociological explanation is that socioeconomic disadvantage is not only associated with material limitations, but also leads to reduced opportunities for participation and weaker social integration: As a rule, socially disadvantaged people do not expand their social networks, but rather withdraw to family and close circles of friends, who are often just as resource-poor as the people affected themselves (cf. Hartung, 2013, p. 73ff). For example, in a study on elementary school students at high risk for the attention-deficit/hyperactivity disorder (ADHD) syndrome, Bussing et al. (2003) show that African American and disadvantaged parents reported smaller network sizes than their white and high-SES counterparts.⁴ Wu et al. (2010) postulate that the family's socioeconomic situation also determines the choice of place of residence and also the resources that can be mobilized through neighborly relationships. According to Coleman (1990), it is to be expected that wealthy parents invest particularly large resources in the quality of the parent–child relationship, since the transmission of parental education and financial well-being to children requires intensive parent–child interactions. The findings are also consistent with the alignment hypothesis of West (1997). According to this, differences in health in early childhood are relatively strongly influenced by the socioeconomic position of the family, which—according to the findings discussed here—is also reflected in a specific endowment with social capital. However, in early adolescence health-specific differences between the various social strata largely disappear, as leveling influences emanate from school, peer group, and youth culture.

Regarding the second question, it is necessary to refer to the study by Klocke (2004), which focuses more on young people with an age range of 11–15 years. Here, an interaction effect between material resources and social capital in predicting health is tested. The findings show that health-related behavior (smoking) improves in all social inequalities with increasing family cohesion and parental support for the child. Even if low material resources often go hand in hand with low social capital, children and adolescents can benefit from good social capital in all social situations.

Even if no interaction effect between socioeconomic status and social capital in the prediction of health is shown for this example from Germany (and research question 2 must therefore be answered in the negative here), the studies on non-Western industrial nations (Adams et al., 2002; Kana'iaupuni et al., 2005) show a different picture: Under the condition of greater material deprivation (Mexico) or extreme poverty (Mali), social capital becomes a compensating or existential factor for the health or survival of children. Even within the two countries discussed

³ According to Wu et al. (2010), however, the decisive factor here is how the socioeconomic status of the parents is operationalized. Thus, the study comes up with the surprising finding that the financial resources of the parents lead to a greater depressiveness of the child. This is explained by the fact that financial resources are an indirect indicator of the amount of work parents do, which reduces the time spent on joint parent–child interactions.

⁴ At the same time, however, African American and disadvantaged parents reported more frequent contact and higher levels of social support.

here, the children of particularly poor families benefit most from social support that is available to their parents.

6 Conclusion

First of all, it is generally recognized that the network perspective and the family social capital approach are very helpful in explaining child health. In almost all cases, the expected positive correlations with health indicators are evident.

Nevertheless, some aspects are to be discussed critically. In particular, sociological studies that are based on the concept of social capital explicitly or implicitly assume that parents are the essential network persons through whom the child gains access to important resources, such as attention or support. In addition, siblings are sometimes also taken into account. Other possible members of the family network, such as grandparents, uncles, or aunts and godparents, are not considered, in contrast to the more differentiated convoy model of the group of authors around Mary J. Levitt.⁵ Overall, studies that conduct “real” network analyses (e.g., ego-centric studies) are rare in the present context.

If the reported findings are interpreted causally, alternative explanations must be referred to in some cases. For example, Martin (2008) states that the connection between the weight of parents and their children is largely due to genetic factors, because the physiological prerequisites for body weight are inherited and predispositions to certain lifestyle characteristics (e.g., physical activity) are partly genetic. If this genetic disorder is statistically controlled within the framework of a twin study,⁶ it becomes apparent that socially caused lifestyle factors both lose explanatory power (mediation) and can gain in importance, that is, are variably hidden by genetic factors (suppression). In the studies discussed here, genetic factors are usually not controlled for, which sometimes leads to problems of interpretation.

Schultz et al. (2009) also examine the question of whether children’s health has an effect on the social capital of parents. If indications of such a reverse causality could be found, this would partly call into question the reported findings in their previous reading. Empirically, however, a study of parents who are observed from birth over a three-year period shows that more or less serious health problems of the baby (e.g., low birthweight, disabilities) have no effect on various social capital indicators as frequency of visits to relatives, frequency of going to church, and activity in organizations.

⁵ Another suggestion to capture broader family configurations comes from Widmer (2006). The “family network method” developed here essentially is formed by name generators, in which Ego is asked to name significant family members who have played an important role in his life at present or in the past year. These can be loved and respected persons as well as persons with whom conflicts exist. A survey based on a student population using this method leads to different types of family social networks that include not only blood relatives but also stepparents and friends who are subjectively considered significant family members (e.g., godparents).

⁶ Multi-group comparisons in structural equation models with monozygotic and dizygotic twins.

Regarding theoretical mechanisms, an explicit test has so far been most likely to be applied to the mechanism of social support. While the support potential from the network has been measured in a differentiated way, measurement tools and research designs for the mechanisms of social control or social contagion are not fully developed yet. There is still a great need for research in this area.

Finally, another interesting aspect concerns the interaction between informal social support in social networks and professional help with health problems. Theoretically, on the one hand, it is conceivable that social support reduces the probability of professional help—e.g., since the child's state of health improves through the help by network members. On the other hand, professional help could become more likely through social support—e.g., by the transmission of attitudes and norms that facilitate access to professional institutions (Martinez and Lau (2011)). The available studies seem to support the first explanation to a greater extent. Martinez and Lau (2011) show that parents whose children have mental health problems tend to be less likely to seek professional help if the level of perceived support from the social network is high. This is partly because children's health actually improves over time when the support potential is high. Bussing et al. (2003) also report that elementary school students are less likely to receive a treatment for their attention-deficit/hyperactivity disorder syndrome if a high level of instrumental support is available in parent's social networks. Despite these first findings, the connection between social support and the utilization of professional help needs more attention and represents an important field for future research.

Reading Recommendations

- Alvarez, E. C., Kawachi, I., & Romani, J. R. (2017). Family social capital and health: A systematic review and redirection. *Sociology of Health & Illness*, 39(1), 5–29. A cross-age overview of research on family social capital.
- Morrow, V. (1999). Conceptualising social capital in relation to the well-being of children and young people: A critical review. *Sociological Review*, 47(4), 744–765. Critical discussion of the social capital approach.

Data Sets/Overview

- **Study on the health of young people in Germany (KiGGS)**

Within the framework of the KiGGS study conducted by the Robert Koch Institute, comprehensive and nationally representative health data for children and adolescents were collected for the first time in 2003–2006. Since 2009, KiGGS has been continued as a long-term study. The data can be used to analyze both the current health situation of children and adolescents under the age of 18 and—due to the panel structure of the data—temporal development trends and changes in the life course. Family social capital can be depicted using various global indicators that measure, for example, family cohesion or parental social control. *Access via*

(continued)

• **Health Behaviour in School-Aged Children—WHO Collaborative Cross-National Survey (HBSC)**

The HBSC survey, which takes place every four years, was initiated in 1982 and is currently conducted in 48 countries (Europe and North America). The aim of the study is to collect nationally representative data on the health, family, and social environment and health-relevant behavior of boys and girls in the fifth to ninth grades, who are generally between 11 and 15 years old. Family social capital is operationalized through a number of global indicators such as emotional or instrumental support from parents. *Access via (international) or (Germany)*

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Social Networks, Health, and Health Inequalities in Youth



Irene Moor , Laura Hoffmann, Martin Mlinarić ,
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Overview

- Social network research is comparatively advanced in adolescence, based on school-based surveys conducted mainly since the 1960s.
- Studies in adolescence focus primarily on health behavior (especially tobacco consumption but also alcohol consumption, nutrition, and physical activity) and to a smaller extent on psychosocial health.
- To explain the homophily of peer groups in adolescence, two different mechanisms are assumed that can only be investigated in longitudinal studies:
 - Thesis of social influence: Friends influence the (health) behavior and attitudes of young people and adapt them.

(continued)

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- Thesis of the selection mechanism: Adolescents choose their friends according to whether they show the same attitudes and (health) behavior as they do themselves.
- Both theses were empirically proven.
- While the importance of social networks in adolescence for health and health behavior has been demonstrated, there is still a considerable need for research on the importance of social networks in explaining health inequalities.
- Only a few studies exist that identified the relevance of the peer group in the context of socioeconomic/educational inequalities and health.
- There is a need for research regarding the role of social networks in explaining health inequalities (beyond tobacco consumption) as well as longitudinal research designs.

1 Introduction

People are connected, and so, their health is connected.

(Christakis & Fowler, 2008, p. 2257, *The New England Journal of Medicine*)

This paper discusses the importance of social networks for health and health behavior and especially health inequalities in adolescence. Adolescence is characterized by a variety of changes that occur in this phase of life. Adolescents are confronted with challenges such as developing their own personality, finding their identity, and dealing with developmental tasks typical for adolescents. A central developmental task is the detachment from the parental home and the simultaneous development of relationships with peers (Havighurst, 1974; Richter & Moor, 2015), which to a large extent takes place in the school context. For adolescents, the group of friends is a central context, since basic social rules such as mutuality, reciprocity, or intimacy can be learned in these power-equivalent relationships (Youniss & Jacqueline, 1986). Friendships develop, among other things, when certain characteristics or behavior patterns are found in the group. In the early 1970s, Kandel (1978) found out that there is a high congruence in the peer group when it comes to the consumption of marijuana. There is evidence that the peer group that dissolves is less common than the one that is newly developing. This congruence orientation was also found in other characteristics, such as other illegal drugs or the choice of political party.

Social network analysis (SNA), for example, makes it possible to investigate the connection between collective norms and individual behavior within the peer group. Questions that can be answered include whether young people are more likely to seek out friends who exhibit similar behavior, or whether young people within certain networks are “encouraged” to behave in a manner that is harmful to their health due to the (harmful) influence of their friends (Hall & Valente, 2007). The

roles or positions that different persons (parents, circle of friends, siblings) take in the network and to what extent these influence the health and health behavior of adolescents can also be analyzed. These and other questions can be examined to the extent and in the level of detail desired with the help of SNA.

Of particular research interest is the importance of social networks for the (re-)production of health inequalities. Numerous national and international studies show, for example, that adolescents with a low socioeconomic status (SES) indicate both poorer health and less favorable health behavior (Kuipers et al., 2016a; Inchley et al., 2020b; Moor et al., 2020; Bucksch et al., 2020; Ahluwalia et al., 2015; Reiss, 2013; Elgar et al., 2015). Although the relationship between social background and health or health behavior has often been investigated in adolescence, few studies have examined the extent to which adolescents' social networks explain this association.

Accordingly, this chapter deals with SNA and health and health inequalities in adolescence. First, the focus will be put on the previous research work on SNA in adolescence (Sect. 1.1). Section 2 presents theoretical assumptions of the SNA (including homophily, thesis of influence, and selection) for health and health behavior. Subsequently, the relationship between health inequality and health (Sect. 3) is discussed, and the significance of the SNA for health and health behavior will be explained (Sect. 4), with a focus on tobacco use in adolescence (Sect. 4.3). The role of the social network in health inequalities will be discussed in Sect. 5, and a summary will be provided in Sect. 6, which will identify research gaps and critically discuss the results.

1.1 Social Network Research in Youth

SNA is an internationally established field of research (see Scott, 2011; Scott & Carrington, 2011). It has multidisciplinary applications, especially in sociology, but also in psychology, economics, and anthropology (Valente et al., 2004). The various disciplines and subject areas agree on one point: Networks have a lasting impact on access to and use of life opportunities in our society. This can be illustrated by a longitudinal study that observed selection mechanisms. It shows that those who perform well at school in adolescence also tend to seek out high-performing friends (Flashman, 2012).

First surveys and analyses of networks between young people in the school context were already carried out in the nineteenth century (Heidler et al., 2014). By the 1960s (Coleman, 1961), a systematic investigation in the context of school surveys was undertaken. These surveys became the leading object of investigation for SNA, especially in the USA (cf. (Marsden, 2011; Freeman, 2004). At the international level, a wide range of topics related to social network research has been analyzed in adolescence; however, in many countries, the debate, particularly regarding health and health inequalities, is still in its infancy.

Subject areas of SNA in adolescence and younger adulthood relate mainly to individual risk behavior and structurally unequally distributed risk exposures,

because socially disadvantaged young people are exposed to a greater number of risks than adolescents from socially privileged families (Alvin & Deschamps, 1998; Friedman & Aral, 2001). For example, cross-sectional research on attempted suicide among adolescents shows clear evidence that the likelihood of planning suicide is associated with peer group characteristics such as an increased proportion of depressed friends (Fulginiti et al., 2016) as well as when friends report suicide attempts (Mueller & Abrutyn, 2015). The frequent contact in the network with friends at risk or depressed friends is particularly alarming in the USA context in the field of youth homelessness, which is also associated with a lack of safer sex practice (Kennedy et al., 2012; Craddock et al., 2016) or increased substance and drug consumption such as crystal meth (Martino et al., 2011; Barman-Adhikari et al., 2016) within the network as studies have shown.

SNA is used for a wide range of health-related research topics. Public health research topics include sexually transmitted risks (HIV) (Neaigus et al., 1995), physical activity (Simpkins et al., 2013; Macdonald-Wallis et al., 2012), the body mass index (Fletcher et al., 2011; Renna et al., 2008), the consumption of tobacco, alcohol, and illegal drugs (Kandel, 1978; Valente et al., 2004), and suicidal behavior and attempts (Mueller & Abrutyn, 2015; Mueller et al., 2021; Xiao & Lindsey, 2021). These topics will be discussed in more detail in the following sections of this paper.

2 Theoretical Assumptions

In this section, the theoretical background of the mechanisms of action of social networks in adolescence and their significance for health behavior will be outlined. Health behavior is embedded in a variety of social contexts. Therefore, social network analysis (SNA) assumes that the social network in which the respective person is located shapes individual behavior. In SNA, *homophily* is presented as a central mechanism of action (see also chapter “[Network Analysis and Health Inequalities: A Methodological Introduction](#)”). Homophily means that people prefer to surround themselves with people who are similar in certain characteristics. This may be the case in relation to demographic characteristics or also in relation to certain types of behavior (Daw et al., 2015). For this purpose, the assumptions of *social influence* and *selection* are described, which consequently lead to social networks comprising homophile group members.

2.1 Social Influence

There is consensus in research on the influence mechanism in a peer group that adolescents are more likely to start smoking if their friends are also smoking. Without using the possibilities of SNA, research could only rely on information

provided by the adolescents about the smoking prevalence in their peer group. Information or characteristics of these friends and their smoking behavior were not taken into account (Hall & Valente, 2007); however, this is the big advantage of SNA. The problem is that young people tend to overestimate the prevalence of smoking among their friends. This has been shown to be particularly true for girls, former smokers who have friends who smoke, and students with lower school performance (Kuipers et al., 2016b). When applying SNA, there is no need to rely on these (often) distorted data, since the social network information is collected and data on all network members are often available. Regarding peer group influence, a distinction could be made between “*endogenous effect*,” “*exogenous or contextual effect*,” and “*correlating effect*” (Ali & Dwyer, 2009).

Endogenous Effect This effect assumes that individual behavior reflects the behavior of the peer group. A person is more likely to smoke if there are many smokers in his or her peer group. If the behavior of one person in the group changes, that change can function as a multiplier effect, which can then also change the behavior of the entire peer group, whose members are in turn in other networks and can thus pass on the change (Ali & Dwyer, 2009).

Exogenous or Contextual Effect This effect assumes that individual behavior depends on characteristics outside the peer group. For example, if many adults smoke in a collective group, this exposure may also affect adolescents. For example, parents who smoke are more likely to influence their children’s smoking behavior (Ali & Dwyer, 2009).

Correlating Effect This effect occurs when people in a group behave similarly due to similar—out-of-focus or unobserved—characteristics. Accordingly, adolescents with similar socioeconomic status (SES) are more likely to form a group with similar social circumstances. Research has also shown that socially deprived adolescents are more likely to smoke than peers who are socially better off. Even if someone from that group were to quit smoking, for example, this would have a smaller effect, as these unobserved characteristics (of, for example, social background) still exist and lead to a higher risk of unhealthy behavior in general (Alexander et al., 2001; Ali & Dwyer, 2009).

2.2 Selection

In contrast to the thesis of social influence, there are not many different assumptions on selection that need further explanation. According to the selection assumption, adolescents decide for themselves and make a preference-based selection as to whom they want to be friend. They are more likely to choose those friends who have similar characteristics or ideas or who show similar behavior. The selection hypothesis also describes the exclusion of friends, that is, the persons that are excluded from the peer group. If friends do not approve their smoking behavior,

for example, the adolescents will turn to those who share these behaviors and do not normally devalue smoking. However, there are often several characteristics and behaviors that create or maintain these networks (Simons-Morton & Farhat, 2010).

For many behaviors, especially smoking, both directions of influence and selection were examined. Both mechanisms appear to be central to the smoking behavior of adolescents and in some cases also have a simultaneous effect (Hall & Valente, 2007; Schaefer et al., 2012). Overall, the selection hypothesis is given more weight in tobacco use (Mercken et al., 2009, 2010, 2012; Seo & Huang, 2012; Littlecott et al., 2021). However, it is methodologically challenging to distinguish between these two effects in the analyses. Only longitudinal studies can examine these mechanisms separately.

3 Youth, Social Inequality, and Health

In adolescence, the health behavior or the subjective assessment of health mainly provides information about the well-being and health-related quality of life of the younger generation. Although health and health behavior in general have tended to develop positively over time, which is reflected in a higher assessment of very good health (Cavallo et al., 2015), higher fruit and vegetable consumption (Vereecken et al., 2015), increased physical activity (Kalman et al., 2015), and decreased tobacco prevalence (Kuntz et al., 2018; Inchley et al., 2020a), not all young people benefit from this development to the same extent. SES remains one of the most important determinants of adolescent health (Inchley, 2017; Viner et al., 2012; Inchley et al., 2020b). Adolescents with a low social status are more likely to have an unhealthy diet, less likely to be physically active, and more likely to be overweight or obese compared to adolescents with a higher social status (Inchley et al., 2020b; Chzhen et al., 2018; Inchley, 2017; Bucksch et al., 2020). Socially disadvantaged children and adolescents report poorer health and are more likely to show an increased risk of mental abnormalities, psychosomatic complaints, and lower life satisfaction compared to those who have a higher school education or live in a more socially privileged family (Moor et al., 2015b; Elgar et al., 2015; Kaman et al., 2020; Richter et al., 2012; Torsheim et al., 2004).

The results are not consistent with risk behavior, but they predominantly show that less educated young people smoke more frequently (Kuntz et al., 2018; Moor et al., 2014, 2019, 2020; Robert et al., 2018) and experience alcohol-related intoxication more often than socially better-off adolescents or those with a higher school education. However, the results are heterogeneous, showing that highly affluent adolescence in some countries consumes alcohol on a regular basis (Inchley, 2017; Moor et al., 2018).

4 Importance of Social Networks for Health and Health Behavior

Unhealthy and harmful behaviors, which can have a strong impact and consequences for health in adulthood, develop during adolescence (Daw et al., 2015; Valente, 2012). Social networks play a crucial role in the context of adolescent health and health behavior. Various studies show, for example, that social networks influence mental health (e.g., Baggio et al., 2017), alcohol consumption (e.g., Deutsch et al., 2014), smoking behavior (e.g., Lorant et al., 2017), nutrition, body weight, physical activity (e.g., Barclay et al., 2013; Simpkins et al., 2013), and drug use (e.g., Pearson et al., 2006) among adolescents. Therefore, the following sections will deal with the significance of social networks for the health and health behavior of adolescents and provide an overview.

4.1 Mental Health

Various studies have examined the influence of social networks on mental health of young people. Baggio et al. (2017), for example, have investigated how the mental health of adolescents aged 12–14 years is related to the structure of the network. They found that adolescents with good mental health are more likely to be friends with those who have similar mental health. Boys were more likely to be friends with boys and girls more likely to be friends with girls. These results are also consistent with findings of other studies (Schaefer et al., 2011). Pachucki et al. (2015) were able to show based on a longitudinal study that adolescents in early adolescence did not become more similar in terms of their mental health over an analyzed period of 3 months. Since that is a relatively short time span, these results should be interpreted with caution. Baggio et al. (2017) also showed that young people with poorer mental health are more likely to have fewer friends and be more isolated in the network than young people with better mental health. Another study found that the more friends an adolescent has in the network, the lower his or her risk is of developing depression. Conversely, those young people who are more isolated and have few connections in the network have an increased risk of being affected by depression (Okamoto et al., 2011).

4.2 Health Behavior

4.2.1 Physical Activity and Nutrition

Physical activity and diet are social behaviors that are often shared and influenced by others and can cause health consequences such as obesity (Cunningham et al., 2012;

Shoham et al., 2012; Trogdon et al., 2008). For example, it has been shown that adolescents who are friends with each other have a similar body mass index (BMI)—in that aspect, the homophily of friendships is evident (Fletcher et al., 2011; Renna et al., 2008). In the study by Renna et al. (2008) with data from the “National Longitudinal Study of Adolescent Health” of more than 20,000 adolescents, however, the influence of friends on the BMI was only significant for girls. A systematic review could show regarding selection and isolation effects that school friends are similar in terms of body weight and BMI (Fletcher et al., 2011). In addition, the results indicate that overweight adolescents are less popular and have fewer friends than adolescents with normal weights in their age group (Fletcher et al., 2011). Girls and especially overweight adolescents are more influenced by their friends regarding their body weight (Trogdon et al., 2008). The influence of friends is shown, for example, by the fact that the risk of becoming overweight in a certain period of time increases by 57% if one of the friends also becomes overweight in the same period of time (Nam et al., 2015). However, there is limited evidence of the way this influence is manifested. On the one hand, this may be direct communication between friends, during which adolescents exchange different views and opinions and thus form common norms, while on the other hand, different behaviors of the friends, for example, diets or physical (in)activities, may have an impact on the body weight of adolescents (Cunningham et al., 2012). In addition to social influence, which can explain the similarity of friends in terms of body weight, selection processes also play a role (Nam et al., 2015; Shoham et al., 2012). This means that adolescents tend to look for friends with similar weights to themselves (Nam et al., 2015). Adolescents who are not overweight tend to make friends with those with similar weights (Nam et al., 2015). Analogous selection effects were found in a longitudinal study regarding the physical activity of about 1900 adolescents (Simpkins et al., 2013).

Overall, various studies could demonstrate that adolescents who are friends with each other or in a common peer group engage in physical activity (Simpkins et al., 2013; Macdonald-Wallis et al., 2012). A review showed that there are inconsistent results regarding the connection between physical activity and the selection of friends (Macdonald-Wallis et al., 2012). On the one hand, there are results that show that physically active adolescents tend to have more friends than less active adolescents, whereas other analyses could not prove an association (Macdonald-Wallis et al., 2012). Furthermore, gender-specific differences could be found, as boys tend to be more similar with each other in terms of physical activity than girls (Macdonald-Wallis et al., 2012). de La Haye et al. (2010) found that female friends are more similar in their screen-based activities, such as watching television or playing computer games, whereas boys are more similar in their consumption of high-calorie food, such as fast food (de La Haye et al., 2010). Barclay et al. (2013) also showed that in general a young person is more likely to eat a healthy diet and exercise regularly if his or her friends do the same. The closer the bond or friendship is between the adolescents, the higher the probability of similar behaviors. These relationships do not depend on same-sex friendships or on migration background (Barclay et al., 2013).

4.2.2 Alcohol and Illegal Drugs

Results from social network research on substance use among adolescents indicate that adolescents who are friends with each other also tend to be similar in their use of different substances (Valente et al., 2004; Kirke, 2004). If adolescents consume substances such as alcohol or are perceived as users, their friends are more likely to also use substances (Kirke, 2004). Adolescents using illegal drugs, for example, are also more likely to have friends who do the same (Valente et al., 2004). Moreover, the number of friends who use illegal drugs is positively associated with the young people's own drug consumption (Valente et al., 2004). Various studies explain this similarity in the consumption behavior of young people based on two mechanisms—selection and social influence—which have already been described in the introduction. Kirke (2004) and Valente et al. (2004) were able to show with social network analyses using typical parameters such as centralization, density, and transitivity that both selection processes and the influence of the peer group explain the similarity in substance use among adolescents and that not only a single mechanism can be used to explain it.

The early consumption of alcohol is especially a major health problem among adolescents. Social networks also play a decisive role here, as they influence the start of alcohol consumption among adolescents. For example, the results of the study by Mundt (2011) show that young people who start drinking alcohol tend to have more friends and boyfriends who also consume alcohol. At the same time, they have closer contact with popular adolescents and also communicate with more friends and acquaintances than abstinent peers (Mundt, 2011). Knecht et al. (2011) found that—based on a longitudinal multilevel network analysis—for adolescents with an average age of 12 years, selection processes play a greater role than social influence mechanisms regarding consumption of alcohol as adolescents were more likely to look for friends who have similar consumption patterns (Knecht et al., 2011). Selection processes also play a role among older adolescents aged 16–17 years (Kiuru et al., 2010). At the same time, the influence of peers in this age group is more effective and decisive than among younger adolescents, and consumption tends to increase with age, underlining the social nature of alcohol among adolescents (Kiuru et al., 2010). Additional differences between the sexes could be demonstrated, as girls resemble their peer group more closely than boys in their drinking behavior (Kiuru et al., 2010). Deutsch et al. (2014) found in their prospective multilevel network analysis that the “closeness” of friendships between adolescents has an impact on their drinking behavior. For example, the influence on their drinking behavior among boys and girls increases when the closeness of friendships with boys decreases (Deutsch et al., 2014). The intimacy of friendships between girls does not influence their drinking behavior (Deutsch et al., 2014). A longitudinal study by Huang et al. (2014) showed the influence of social media, such as Facebook, on the drinking behavior of adolescents. Adolescents whose friends upload photos on social networks that depict them drinking or celebrating with alcohol have a higher risk of consuming alcohol themselves (Huang et al., 2014).

However, it should be noted that only egocentric networks were surveyed and analyzed.

4.3 Importance of Social Networks on Tobacco Consumption

A particularly large amount of research on the health significance of social networks in adolescence focuses on tobacco consumption; therefore, this section will place emphasis on tobacco consumption among young people and outline the current state of research.

Although tobacco consumption in adolescence has declined significantly (Kuntz et al., 2018; Inchley et al., 2020b), experimentation with smoking and the initiation of consumption continue to take place primarily in adolescence. At around 13–14 years of age, adolescents turn to tobacco for the first time (Moor et al., 2016). In this context, an early entry age into substance use is associated with a problematic consumption behavior in adulthood (Kendler et al., 2013). In addition, regular tobacco consumption is also associated with (long-term) health risks such as increased morbidity and early mortality (World Health Organization, 2015). Since the majority of social network studies have been conducted on tobacco consumption in adolescence, they will be discussed below.

4.3.1 Importance of Different Network Members

It has been proven in many studies that a higher number of smokers in the peer group increases the probability that the adolescent will also smoke (Ennett et al., 2008). Alexander et al. (2001) were able to prove that the probability of smoking is doubled when at least half of the peer group smokes, or if one or two best friends smoke, and also with increasing smoking prevalence in the school attended. Less research has been done so far on other characteristics of friends or relationships with friends regarding adolescent smoking behavior. These include, for example, the number of friends and the closeness of the friendship, the quality of the friendship (reciprocity of friendship, out-of-school activities, commitment of the friendship), the status or position in the peer group (*betweenness centrality*—the extent to which adolescents connect different groups of friends), or the (further) behavior of friends are all related to smoking, as was investigated in a longitudinal study involving more than 6500 adolescents aged 11–17 years (Ennett et al., 2008).

Simons-Morton and Farhat (2010) were able to show in their review, which included longitudinal network studies on the importance of the group of friends in adolescent tobacco consumption, that the best friend has a greater influence on tobacco consumption than other friends. However, this influence was reduced if other friends show the opposite behavior (e.g., not smoking). Group behavior (social norms) also influences one's own smoking behavior. The influence of the group of friends was given, but selection processes were of greater importance, since

adolescents increasingly sought friends with similar behavior. Furthermore, the review showed that parents also play an important role—if they smoke, their children are likely to smoke as well.

In the long-term study *Add Health*, Ali and Dwyer (2009) investigated the importance of the influence thesis of different persons in the network on smoking behavior from adolescence to young adulthood on the basis of three survey waves (completed in 1994, 1996, and 2002). It was shown that even after controlling for socio-demographic and parental characteristics, there is a clear peer influence on tobacco consumption. If the smoking prevalence among classmates increases by 10%, the probability of one's own tobacco consumption increases by 3%. If the smoking prevalence among close friends increases by 10%, the probability of smoking increases by 5%. The influence of close friends continues into adulthood (Ali & Dwyer, 2009). With the Add Health study, Daw et al. (2015) were also able to show that siblings, followed by friends and classmates, have the greatest influence on smoking. The influence was greater when a friendship was reciprocally indicated (Daw et al., 2015).

Position in the Network

Heterogeneous results can be found regarding the position of ego in the network and smoking behavior. Some studies found that adolescents in isolated positions—when they reported having few or no friends or friendships with classmates—were more likely to smoke (Seo & Huang, 2012; Ennett et al., 2008; Valente et al., 2004; Littlecott et al., 2021). There are heterogeneous results and interpretations. Seo and Huang (2012) assume in their systematic review of social network analyses of adolescent smoking behavior that social isolation can lead to adolescents using tobacco to reduce emotional stress. It is also conceivable that the association is vice versa, indicating that adolescents were excluded from a (former) group of friends because of their tobacco consumption.

In contrast, other studies conclude that smokers are more popular among their peer groups (Schaefer et al., 2012; Lakon & Valente, 2012; Moody et al., 2011). However, it depends on the peer group considered. Smokers are more popular in peer groups that include many smokers. In this context, selection process could be identified with the help of the Add Health study, which shows that smokers also befriend other smokers (Schaefer et al., 2012).

Both the social pressure from the peer group (Seo & Huang, 2012) as well as the school context could play a role. For example, it was reported that smokers are more popular in schools where tobacco prevalence rates are generally higher, while in schools with lower smoke prevalence, more popular students tend to smoke less. In some results of the Add Health study, popularity was measured by the summed-up friendship ratings of students (in-degree centrality) (Alexander et al., 2001).

5 Socioeconomic Inequalities in Substance Use: The Role of the Social Network

In the field of health and health behavior, there are currently only a few studies that use social network analysis to investigate socioeconomic inequalities among young people. For example, there is a lack of studies that look at the mental health of young people in the context of the network and socioeconomic status (SES). There has also been little research on physical activity and nutrition among young people. Therefore, this section aims to provide an overview of previous findings regarding substance use—especially tobacco use—among young people and the role of social networks in relation to SES.

5.1 Use of Alcohol and Drugs

On average, 39% of young people aged 15 years drink alcohol (measured by drinking in the last 30 days) (Inchley et al., 2020a). Boys consume alcohol more frequently than girls (European School Survey Project on Alcohol and other Drugs, 2016). Overall, there are only a few studies that use SNA to investigate socioeconomic differences among adolescents regarding alcohol and drug consumption. Pearson et al. (2006), for example, conducted a study on 13–15-year-olds and found that girls and adolescents with higher SES are more likely to be integrated and more popular in peer groups (*friendship nominations received*) and to nominate more friends themselves than boys or adolescents with low SES.

5.2 Tobacco Consumption

Adolescents with a lower educational level smoke more frequently than socially better-off adolescents (Kuntz et al., 2018; Moor et al., 2020; Robert et al., 2018). This is particularly true when considering the type of school attended: For example, in Germany, only 3.6% of girls aged 15 who attend a higher education at school report smoking at least once in the last 30 days (boys: 4.1%), but 9.2% of girls who attend a lower educational type of school report the same (boys: 7.6%), according to the findings from the HBSC study (“Health Behavior in School-aged Children”) from 2018. At this point, it remains unclear which factors are responsible for smoking or for education-specific inequalities that influence tobacco consumption. It is known that social contexts, such as family, school, and peer group, play a central role in smoking behavior in adolescence (Simons-Morton & Farhat, 2010; Simetin et al., 2011; Piko & Kovacs, 2010; Schaefer et al., 2012; Moor et al., 2015a), but the impact of social inequalities has been less investigated.

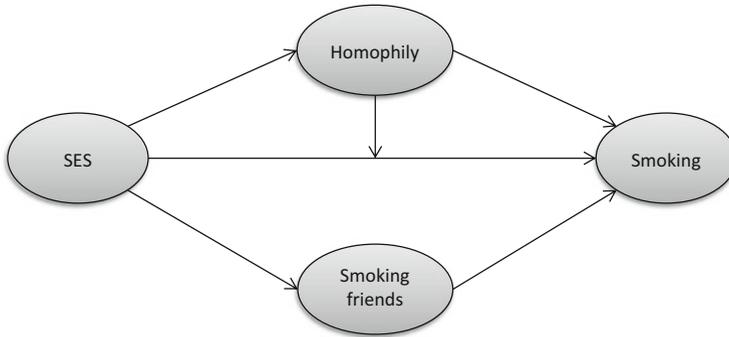


Fig. 1 Tobacco inequalities: conceptual model. Source: Lorant et al. (2017)

Among the few studies on smoking behavior in adolescence that take socioeconomic inequalities in the context of social network analysis into account are, e.g., SILNE (2013) (“Tackling Socioeconomic Inequalities in Smoking: Learning from Natural Experiments by Time Trend Analyses and Cross-National Comparisons”) and SILNE-R (2016/2017) (“Enhancing the Effectiveness of Programs and Strategies to Prevent Smoking by Adolescents”), which were conducted using SNA in six and seven countries, respectively, of the European Union (EU) investigating socioeconomic inequalities in tobacco use among 14–16-year-old school students (Lorant et al., 2015, 2016, 2017; Robert et al., 2018). The results of the first SILNE study indicate that socially disadvantaged adolescents smoke more often and that there are more smoking peers in their school network than among those with a higher social status. The study further found that the smoking behavior of friends and the homophily of the group mediated the link between SES and tobacco consumption (Lorant et al., 2017). Lorant et al. (2017) developed a conceptual model (see Fig. 1) that takes into account both smoking among friends and social homophily.

According to this model, which is based on DiMaggio and Garip (2011), two conditions must be met: Tobacco consumption must be interdependent, that is, dependent on others, and social relationships must be socially homophile. As already mentioned, adolescents are more likely to start smoking if their friends also smoke, and the same applies to non-smokers. Tobacco consumption or non-consumption also defines the group and its social cohesion. It has also been described regarding the second condition that social relationships do not arise by chance, rather groups are created or continue to exist because group members share similar characteristics, such as gender, SES, migration, and so forth (Lorant et al., 2017). Lorant et al. (2017) were also able to prove the model empirically; the connection between a low social status and smoking behavior was partially explained by (more) smoking friends (close and not so close) as well as by social homophily. However, the effect of selection or influence could not be clarified in this study, as it is not a longitudinal study.

Pearson et al. (2006) were also able to establish a link between social status and tobacco consumption. In their study, they found that girls and those with higher

school SES (i.e., lower proportion of deprived students in school) are more likely to be integrated and more popular in a group and have a larger network. Smokers were more likely to be isolated or have a small network.

Moreover, regarding quitting smoking in adulthood, it is evident that friends with higher levels of education have a greater influence on each other than those with lower educational levels (Christakis & Fowler, 2008). This has also been shown in studies among adolescents, where homophily varies according to the educational level of the parents. Homophily in friendships is higher among those adolescents whose parents reported higher education compared to those who are less educated. This relationship was true for smoking as well as for other behaviors such as alcohol and television consumption and physical activity (Daw et al., 2015). Similar results were also shown by Robert et al. (2018) based on the SILNE study. Adolescents are not only homophilic about smoking behavior, but also about school performance. Students with poorer school performance are more likely to be friends with each other than those with varying school performance. The connection between school achievement and smoking behavior could be partly explained by smoking consumption and homophily of friendships as well as by school type.

Huisman and Bruggeman (2012) examined the importance of social networks on smoking in adolescents, taking into account both the type of school and parental education. The authors conducted a longitudinal study among 13–14-year-old Dutch adolescents in the 2008–2009 school year and analyzed the mediating role of the social network. For this purpose, the students in each school class were asked to name up to 15 other students with whom they are friends. The information in the network was analyzed using SIENA.¹ Since the social background of the parents often shapes the school education of the children, and school is a special place for social contacts, the question was to what extent the peer group played a mediating role between school type and smoking behavior. The results showed that the effect of the school type on smoking is mediated by the social network (smoking friends), even after adjusting their own smoking behavior (Huisman & Bruggeman, 2012). This is a very important result, as it means that not only is the adolescent's school education itself responsible for smoking behavior, but also or even to a higher extent the (school) friends who smoke and mediate the effect between school type and smoking.

¹SIENA is a static program for the analysis of social networks, which is used especially for longitudinal data (see also chapter “[Network Analysis and Health Inequalities: A Methodological Introduction](#)”).

6 Discussion and Conclusions

6.1 Summary and Critical Reflection

For adolescence, there is a wide range of studies that have analyzed factors influencing health and health behavior in this stage of life. Interest in social determinants is increasing since health inequalities become apparent as early as adolescence and have a lasting negative impact on health and health-related behavior over the life course. However, less attention has been paid to the role of the social network in the (re)production of these health inequalities, although social network analysis (SNA) reveals promising approaches in this regard. One exception is the school context, which was given a strong emphasis in social network research at an exceedingly early stage, so that a relatively large number of studies can be drawn upon compared to studies examining other phases of life. Especially regarding smoking behavior and the importance of the social network, there is evidence that considers the entire class network and thus the entire network. However, fewer network studies have been conducted on (mental) health and other behaviors, although the number is increasing, e.g., on suicidal behavior (Xiao & Lindsey, 2021; Abrutyn et al., 2020).

6.1.1 Methodological Challenges

Methodologically, SNA on adolescence is a huge challenge, since entire classes must be surveyed to completely cover networks, but this is subject to data protection hurdles. Apart from this, the available studies must also be critically examined. For example, in the study by Schaefer et al. (2012), data from 1994 to 1996 were taken into account, while Alexander et al. (2001) evaluated data from 1994 to 1995, which is quite old as smoking norms changed enormously in the last 30 years. The question is whether these results are still valid nowadays. At that time, smoking prevalence was significantly higher and smoking itself was more socially accepted and less stigmatized. Whether or not smokers were isolated in these studies at the time would have a different meaning than whether they were isolated in more recently conducted studies, as social norms concerning smoking have changed. However, studies that only look at the school network and identify, for example, smokers as isolated individuals may come to distorted conclusions. It is possible that these students are part of a broad network outside school and are not isolated there (Pearson et al., 2006). In school-based network studies, therefore, a “blind spot” may arise which should be given consideration. In addition, it is often asked whether friends, family members, and classmates have certain characteristics, but less often the quality of the relationships (e.g., frequency of contact, positive/negative relationship) is analyzed. An essential question of SNA is whether only the relationship with different persons has a (different) influence on our behavior, or whether this influence also has a different meaning for different behavior patterns. Some studies have investigated this question, but the evidence is still insufficient. For example, one study showed

stronger associations regarding social network on smoking compared to alcohol, television consumption, or physical activity (Daw et al., 2015). Further studies, such as qualitative studies, should be conducted to understand the mechanisms of action.

6.2 Conclusion and Research Desiderata

The current contribution was able to show that SNA still has significant research gaps in some areas. There is an increasing number of studies in the school context, which mainly examine tobacco consumption in association with the social network, but only few studies have been carried out on other health behaviors and especially on (mental) health. Another problem is that mostly only the school network is analyzed and not other networks, such as out-of-school friends, family network, and so forth, which could lead to inaccurate results. Many studies are based on cross-sectional studies that do not allow a causal statement. There is a lack of longitudinal studies that can more precisely identify the causal mechanisms (except for studies on tobacco consumption, where longitudinal studies are more common). It is also noticeable that SNA is mainly dealt quantitatively. There are hardly any qualitative or ego-centered studies on adolescence, although it is possible to investigate how and why the social network affects health and health-related behavior from that view. That study would have some advantages—for example, changes in norms over time could also be considered. For the relationship between tobacco consumption and the social network, the position in the network could reflect norm changes rather than friend relationships, since social acceptance and tobacco prevalence have changed over time. Those with higher social status, for example, distinguish themselves by largely refraining from smoking. People with lower social status continue to smoke, which is accompanied by an increasing social-normative devaluation, the stigmatization of smoking, and, thus, socially disadvantaged population groups (Bell et al., 2010; Chapman & Freeman, 2008; Reuband, 2014).

In conclusion, it should be noted that there is a significant lack of SNA studies that also take socioeconomic differences into account beyond tobacco consumption. However, the evidence is quite limited by the extent to which the social network can explain health inequalities. A few studies have shown a mediating effect (Huisman & Bruggeman, 2012; Lorant et al., 2017). A moderating effect has also been demonstrated, in the context that the influence of the social network in quitting smoking is more pronounced among friends with higher educational levels than among friends with lower educational levels (Christakis & Fowler, 2008). Further studies that can help add knowledge to the research gaps regarding other health outcomes are highly needed.

Reading Recommendations

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Data Sets/Overview

- **“SILNE” (Tackling socioeconomic inequalities in smoking: Learning from natural experiments by time trend analyses and cross-national comparisons)**

SILNE is a project funded by the European Commission and based on school network data. It investigates smoking behavior and norms of adolescents aged about 14–16 years at family, socioeconomic, and school levels in six European countries (Belgium, Finland, Germany, Italy, the Netherlands, and Portugal).

- **“SILNE-R” (Enhancing the Effectiveness of Programs and Strategies to Prevent Smoking by Adolescents)**

SILNE-R includes a quantitative repeated survey of SILNE with a focus on school tobacco control policies. Smoking innovations such as e-cigarettes and

(continued)

the health literacy of young people were also analyzed. In addition, qualitative focus groups with adolescents and expert interviews were surveyed, which can be linked to the quantitative findings for many questions.

- **Add Health (National Longitudinal Study of Adolescent Health)**

Longitudinal study on adolescents in America in grades 7–12, among others, on the topics of substance use. The study offers many different network parameters and examines different relationships (school and family relationships).

- **VOCL'99 (Longitudinal Cohort Studies on Secondary Education—Cohort 1999)**

In this Dutch longitudinal study, students aged 13 years on average were included in the study. The study examines the stability of youth relationships in the peer context in a longitudinal way.

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Social Networks and Health Inequalities in Young and Middle Adulthood



Holger von der Lippe  and Olaf Reis 

Overview

- There are likely to exist relevant interconnections between social and health inequalities, biographical transitions, social networks, and health behavior in the life course of young and middle-aged adults. Many of these correlations have not yet been sufficiently researched.
- Life course and life span theories of development in adults' social relationships are reported and evaluated for their adequacy in contributing to the understanding of health and health behavior.
- Exemplary studies on the health significance of social networks in different biographical transitions in young and middle adulthood (such as couple formation, divorce, leaving of adult children) are presented.
- According to current research, a statistical mediation effect of social networks on the impact of social inequalities on health is most likely.
- At the time being, the research situation is not satisfactory; further empirical and theoretical efforts are considered necessary.

Illness, loss of balance, does not only mean a medical-biological fact, but also a biographical and social process.

(Gadamer, 1993, our translation)

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1 Introduction: The Thematic and Paradigmatic Framework of Social Networks and Health Inequalities in Young and Middle Adulthood

At the beginning of his introduction to “Social Networks and Health,” Valente (2010) already formulated a central postulate that will be fundamental for this chapter. He stated that the scientific study of social networks in the health context must always take an *interdisciplinary approach* to the subject and take into account a *developmental and life span perspective*. This is a challenging demand, since it means on the one hand that networks and health can and should be understood as a sociological topic (e.g., unequally distributed, dependent on social class), as a psychological topic (e.g., dependent on behavior and personality), and as a topic of a number of other disciplinary perspectives (e.g., epidemiological, biological-physiological, health science). On the other hand, Valente’s postulate also means that the question of network effects in the health context can hardly be posed generally for “the human being,” but will come to different results for different age groups or situations in the life course (i.e., requires a life span perspective).

In our chapter, we will take up Valente’s postulate and deal with the *health and inequality aspect of networks from a psychological as well as sociological life span perspective*. In doing so, we will pay attention to the mutual interactions between health, social inequality, and networks in the context of biographical transitions that decisively shape the life course of adults (Lang et al., 2006) and focus exclusively on young and middle adulthood—here roughly defined as the age span of about 20–60 years. A second focus of our presentation will be the developmental psychology of life span (Brandstädter & Lindenberger, 2007), whose conceptual understanding of networks and health has so far received little attention in research.

In this section, we will introduce the disciplinary perspectives and paradigms that deal with the topic of networks and health inequalities in different phases of life. Here, we define central concepts such as *life course* and *transition, relationships and networks, health and risk behavior*, and *social and health inequalities*. Section 2 presents theories that describe interactions between these concepts. Here, we focus in particular on social and developmental psychological theories that link the above-mentioned constructs to adulthood as a phase of life.

In the following sections, we will summarize the state of research on the relationship between social and health inequalities (Sect. 3), networks and health (Sect. 4), and inequalities, networks, and health (Sect. 5). In order to illustrate young and middle adulthood as a particular phase of life, we will take a closer look at three transitions: the entry into a stable partnership, divorces and separation events, and children leaving their parental home. These biographical transitions are typical events of young and middle adulthood, and the literature indicates that such normative or non-normative transitions can be understood as “vulnerable times” of individual development, in which possible network effects on health might become particularly visible (Lang et al., 2006). We conclude with a summary and some desiderata for future research (Sect. 6).

1.1 *Disciplinary Perspectives on Networks and Health Inequalities in Young and Middle Adulthood*

From a *sociological perspective on inequality*, the age span of young and middle adulthood has always been regarded as a very significant and dynamic phase of life that involves continuous individual change. Between the ages of 20 and 60, individuals experience various biographical events (so-called transitions such as moving out of the parental home, moving house, marriage, professional transitions, divorce, etc.). These all have the potential to increase or decrease social, psychological, and health differences. A “transition” in this context refers to a person’s change from one life situation to another with a marked before-and-after distinction, which is usually accompanied by a defined transition in social status and/or social identity. Such transitions are particularly often accompanied by changes in the structure and function of social relationships and networks.

Health science research has also increasingly focused on the course of subjective and objective health differences in young and middle-aged adults. From the *subjective health perspective*, this age phase has been described, for example, by the U-shaped course of life satisfaction and well-being, thus important measures of the subjective aspect of mental health (Stone et al., 2010). In the analysis of seven large datasets (*Office for National Statistics Data* for Great Britain, BRFSS and GSS Data for the U.S., Eurobarometer and ESS for Europe, ISSP Data for 45 countries in six continents, Latino Barometer Data for Central and South America), obtained from participants from all over the world, Blanchflower and Oswald (2017) found a constant decline in life satisfaction in most populations until the low point at the beginning of the sixth decade of life (i.e., around age 50), before this measure rose again markedly until the eighth decade. This finding was robust even when various intermittent factors (e.g., gender, educational level, employment status, objective health status) were statistically controlled for.

In addition to the subjective variables, there are also a number of *objective health changes* that occur in adulthood, mostly from the beginning of the fourth decade of life. These include the gradual decrease in sight and hearing, reduction of muscle mass in the sixth decade of life, and reduced bone stability. Gender differences are evident for many of these declines, and correlations with hormonal regulation have been proven. A list of these biologically based objective health changes can be found, for example, in Riggs et al. (2008) or Santrock (2015).

Interestingly, *psychology*—in particular personality and developmental psychology—has for many decades formed a certain contrast in the lack of consideration of young and middle adulthood compared to the two aforementioned disciplines. For a long time, this age span was regarded as a phase of life that was characterized above all by a *high stability of individual characteristics*. The findings, dating back to William James (1842–1910), concluded that the individual personality was quasi “set in plaster” when reaching adulthood and that there were hardly any relevant changes in individual differences, neither in the core personality (such as, for example, extraversion or neuroticism; Costa & McCrae, 1994) nor in other

health-related dispositions of the individual (such as mental health, self-esteem, susceptibility to depression; Becker, 2006).

For three decades, however, the developmental dynamics of young and middle adulthood have been rediscovered in psychology as a research topic and the “stability verdict” has been questioned (Baltes, 1987; Lachman et al., 2015; Roberts & DelVecchio, 2000; Specht et al., 2014; Van Dulmen, 2013). According to the current state of research, biographical transitions in particular have the potential for impacts on personality traits of individuals. For example, American women between the ages of 27 and 43 who have experienced professional advancement do report personality changes such as an increase in self-efficacy (the authors speak of *agency*) and increased *norm adherence* compared to women who have not experienced such advancement (Roberts, 1997). Neyer and Asendorpf (2001) showed in a student sample that those participants who experienced the transition from single life to a stable partnership within the course of 8 years significantly reduced their neuroticism—regardless of whether this partnership was maintained or not. In such dynamic biography-personality transactions, the degree of normativity (i.e., expected realization) of a transition appears to be a significant factor (see, for an overview, Neyer et al., 2014). As a result of such studies, the question for the connections between social relationships, health-related personality traits, and the individual life course has now become a genuine research topic in psychology (Klauer & Greve, 2005; Knoll & Schwarzer, 2005; Weber, 2005).

1.2 Relevant Research Paradigms on Networks and Health Inequalities in Young and Middle-Aged Adults

The following overview of the state of research on social inequality, networks, and health in young and middle-aged adults is framed by *five overarching and interdisciplinary research paradigms*. The first, originally a sociological paradigm of the *life course (1)* (Mayer, 2000; often referred to in psychology as the *psychology of life span* (Antonucci et al., 2010; Baltes & Smith, 2004), considers sociological as well as psychological phenomena in a *direct constitutive* connection with biological age, the age in which individuals or population groups find themselves, and the sequence of transitions already completed or to be completed. This means that age and biographical transitions experienced so far are not only considered here as concomitants (accompanying conditions), but also as direct (causal) factors on phenomena of interest.

For example, Dragano (2007) describes the *individual sequence of biographical transitions as a crucial component* of a person’s *stress biography*. According to Dragano, a stress biography represents the biographical sequence of pathogenic as well as salutogenic factors, which also include network changes. In psychology, a similar approach is followed by the Critical Life Events approach, in which direct and indirect stress effects after the occurrence of an unexpected or unwanted

transition or event are evaluated (Klauer & Greve, 2005). In both approaches, the impact of events and transitions depends on individual coping potentials that change *with age*. Again, this demonstrates the necessity of a life span perspective for health and networks (Lohaus & Klein-Heßling, 2009; Wurm & Tesch-Römer, 2005).

Other central paradigms for this chapter describe a person's changes in social contexts throughout the life span, focusing on *social relations* (2) and *social inequalities* (3). Most research on *changes in social relationships* in young and middle adulthood focuses on the specific changes in individual relationship types (social domains) rather than on the change in networks as a whole (an important exception: Wrzus et al., 2013). The meta-analysis by Wrzus et al. (2013) of 243 primary studies, which mostly investigated the size of personal networks in young and middle adulthood, showed a peak around the age of 30, at which both network size and the relative proportion of unrelated persons are most pronounced, only to decline continuously thereafter. However, little is known about the course of support and other network effects regarding health over the life course (see chapter "[Social Network Mechanisms](#)"). It has so far only been researched that changes in *proximal* (i.e., close, familiar) or *intimate* relationships (e.g., love relationships) always correspond to systematic changes in *distal* relationships (e.g., networks of friends and acquaintances), for example, when the dissolution of a marriage is accompanied by the loss of contact with such relationships of the ex-partner. The extent to which social relationships and social inequalities also translate into *health inequalities* (4) will be discussed in the following sections of this chapter.

It is also known from life course and life span research that young adulthood can be described as a *peak phase of experimenting with different health and risk behaviors* (5), but also as a course-setting age for the consolidation of longer-term habits (Fookien & Kavšek, 2012). In this context, health behavior refers to activities whose health-promoting effects are known, such as a balanced diet or regular exercise. The opposite is true for risk behaviors, such as tobacco or alcohol consumption (Knoll et al., 2011). Sussman et al. (2011), for example, discuss that young adulthood in particular is a risk age for habitual substance use and that similar observations can be made for other risk and health behaviors. Thus, young adulthood in particular is becoming increasingly relevant from a prevention-oriented, health sociological, and psychological perspective.

For the *end of young adulthood* and the *beginning of middle adulthood* (i.e., the years around the age of 40), a further shift in individual health behavior can be observed in the health-psychological and social epidemiological literature, which finds a marked increase in subjective interest in health and an abandonment of many—although not all—risk behaviors (Lachman et al., 2015). This is attributed to the subjective and socially shared perception of many people in this age group that the peak phase of physical strength and resilience is coming to an end and that a new focus on health and well-being is necessary to maintain private and professional performance.

After a brief foray into some relevant theories, we will then present the current state of research on the links between social and health inequalities as well as between social networks and health. We will refer to the above-mentioned

exemplary transitions of young and middle adulthood as motors of individual development and health inequality.

2 Special Psychological Theories of Life Course and Network Development in Adulthood

The chapters “[Social Network Mechanisms](#)” and “[Social Network Theories: An Overview](#)” in this volume have already presented important theoretical models, which will not be repeated here. At this point, we would like to draw on some additional developmental and social psychological theories from life span research, since these are suitable for making the connection between network development and biographical transition plausible.¹

Two social and developmental psychological theories of life span development, which describe a connection between transitions and personal networks of relationships (and indirectly also with mental health) in young and middle adulthood, have been in the foreground of developmental health research. These are the Theory of Socio-Emotional Selectivity (SST; Carstensen et al., 1999) and Social Convoy Theory according to Kahn and Antonucci (SCT; Kahn & Antonucci, 1980; Antonucci et al., 2011). *SST* assumes fundamental developmental tasks (Havighurst, 1976) of the individual, which provide a blueprint for the construction of his social relationships. According to this theory, developmental tasks are chosen by the individual depending on the subjectively perceived remaining lifetime. At the beginning of adulthood, due to a subjectively relatively “unlimited” future perspective, developmental gains are desired and efficiency goals are in the foreground (Yeung et al., 2008). Conversely, with decreasing subjective lifetime, emotional regulation goals become more and more important and attachment motives are then in the foreground. According to SST, motivational development in young adulthood is accompanied by a tendency to construct larger and more loosely knit networks, while in middle adulthood personal relationship networks are increasingly reshaped in such a way that proximal (family) relationships are intensified and more distant relationships, for example, shorter and less intimate contacts, are abandoned or reduced.

¹Here, we would like to point out, once again, the distinction between “network effects” and the well-known “social support research.” While the close connection between perceived and provided social support and health can be considered generally confirmed (see the classical meta-analyses by Schwarzer & Leppin, 1989; Smith et al., 1994), network analysis is a detailed examination of the composition and structure of relationship populations. In our literature search, therefore, only studies were selected that also reported dyadic relationships between individuals and network partners or at least a weighting of different network sectors (e.g., family vs. circle of friends). We classify a study as a “network study” and include it in this presentation only where such insights into network structure are provided.

The SCT concurs with the SST in that people do not go through life alone, but are constantly embedded into a relevant environment of social relationships (convoy). According to this theory's tenets, this *convoy of life* is divided into proximal, more stable relationships and distal, less stable relationships. Antonucci et al. (2011) conceive less of a change in the subjective weighting of both types of relationships over the life span, but rather of a continuing relevance of both. According to this theory, the main difference between these types of relationships is that distant relationships are restructured and adapted to the circumstances after a transition (e.g., by making new friendships and de-intensifying or abandoning old ones after a divorce or a move), while proximal (core) relationships of the network should be relatively independent of various transitions.

Both theories thus postulate that proximal relationships with family members and friends tend to remain constant over the life span, while distant relationships decrease with increasing age for intra-psychological reasons (SST) or by means of life events (SCT). In a meta-analysis of both approaches and the change in network size over the life span, Wrzus et al. (2013) conclude that empirical evidence can be found for both theories so that the theories differ more in the underlying mechanisms than in their predictions of the size and nature of networks. Nevertheless, both network theories remain deficient with regard to the development of health or social inequalities.

Other theories of network development in adulthood are of a more structural nature or focus on individual domains (social areas). The structure-oriented *Theory of Interrupted Dyads* (*dyadic withdrawal*, Johnson & Leslie, 1982), for example, assumes that with the transition to partnership, especially marriage, networks of friends of both partners become smaller. It is possible that different dyads, such as partnership and friendship relationships, compete for the resources of the individuals (*competition principle*) so that the growing affection for partners or children leads to a reduction in peripheral relationships. In addition to competition, there is also a need for balance in the sense of Heider's balance theory (see chapter "[Social Network Theories: An Overview](#)"): balancing or harmonizing interactions of proximal and distant relationships are also conceivable. The reduction of the individual networks is often accompanied by a homogenization and overlapping of the friendship networks of both partners (Kalmijn, 2003), whereby the competition or the abandonment of friendship relationships for a partnership can be absorbed by balancing—for example, the construction of common networks. Such connected *networks* (*joint networks*) then belong to the social capital of a partnership or family. This form of social capital stabilizes couple relationships and also deepens the partners' dependence on each other (Kalmijn & Bernasco, 2001). Through this mechanism, joint networks, like professional success, can reinforce personality traits such as the aforementioned *norm adherence* of partners (Milardo & Allan, 2000).

The *Theory of Relational Turbulence* (Solomon & Knobloch, 2004) aims to ensure that transitions and the network changes that accompany them do not remain without effect on proximal relationships, especially the partnership. Many transitions or events in adulthood can endanger partner relationships, be it professional difficulties, unwanted childlessness, or serious illness (Nagy & Theiss, 2013). Such

challenges to the partnership are then often overcome by changing relationship scripts (norms and routines), which can be adaptive (e.g., health-promoting), but also maladaptive (e.g., health-threatening). With the Theory of Critical Life Events (Filipp & Aymanns, 1987), it can be described more precisely that a central task of adulthood is to cope with such turbulences and to maintain relative stability in one's partnership. Health science and social epidemiological life course research has shown that unresolved critical life events can have a long-term negative impact on health (Stephens, 1998, as quoted in Marmot, 2000). These theories are also of a more psychological nature; that is, they are not embedded in the context of the development of health inequalities. However, critical life events vary in frequency and severity depending on social background.

Starting from the paradigmatic concepts mentioned above, we will now focus on instances of *biographical transitions* that illustrate and discuss the changes in social and health inequalities and networks in adulthood. Examples of these transitions are the transition to partnership/marriage, divorce/separation, and the departure of one's own children from the parental home. This selection is justified by the fact that, on the one hand, the interplay of sociological and psychological effects can be well illustrated, but on the other hand, these transitions can have considerable effects on life and health in adulthood. Other relevant transitions of adulthood, such as the transition to unemployment (see chapter "Unemployment, Social Networks, and Health Inequalities"), are dealt with elsewhere in this volume. While entering into a partnership and children leaving home are normative transitions that can be expected for the majority of adults, divorce remains a non-normative event despite relatively high prevalence. Thus, unlike the first two, divorce is not a firmly expected and desired transition in the individual life course, but is usually experienced as a crisis-like experience and is aversive (Filipp & Aymanns, 1987).

3 Inequality (SES) and Health

The close connection between social and health inequalities in adulthood has been demonstrated in numerous social-epidemiological studies (for an overview Cutler & Lleras-Muney, 2010; Hurrelmann & Richter, 2013; Mielck, 2005). For example, people with lower formal education smoke more, eat less healthy food, and die at an earlier age than those with higher education (Hoffmann et al., 2018). Overall, there is a generally large health burden on the lower status groups, although interestingly, this effect seems to be mitigated in some rather egalitarian societies, such as the Scandinavian ones. For example, in an epidemiological study of 1003 Norwegian middle-aged adults (46.3 years), Dalgard and Håheim (1998) report that income had *no* significant influence on mortality over 17 years.

For the German epidemiologist Mielck (2005), the close connection between social and health inequalities, which is typical for many countries, is explained by the fact that social groups with a lower status are less healthy than those with a higher status because they exhibit more risk behavior and less health behavior. These

groups are, according to the author, exposed to greater biographical burdens (e.g., material deprivation, poorer working conditions), receive less or ineffective social support, and are often less able to benefit from medical care or prevention. These mechanisms would explain many of the relationships described in Sect. 1.2. When applied to the biographical transitions during young and middle adulthood, this would mean that people of lower status experience more burdens during this age span, including more burdensome transitions, receive less or more ineffective social support, and are less able to cope with these burdens than higher status groups. They also benefit less from professional (e.g., medical-psychological) health care. What evidence does the literature provide for these assumptions in the context of relevant biographical transitions?

3.1 Transitions in Partnerships as a Driver of Health Inequalities

The predominant pattern of entering and dissolving young adult partnerships in Western industrial societies has been described as *sequential monogamy* (e.g., Morris & Kretzschmar, 1995). Partnerships are usually associated with having *one partner* at a time, but several partnerships of varying durations follow each other. There are clear inter-individual differences, however, in *when and* whether people get married or live together as a couple and the total number of partnerships experienced in this age group (Schneider & Rüger, 2008). These parameters are important for the dimensions of inequality and to health.

It is empirically proven that stable partnerships have a positive influence on subjective well-being (Schütz & Wiesner, 2000). They also represent a frequently confirmed protective factor for physical illnesses, which seems to apply particularly to men (*healthy-marriage-hypothesis*, Carr & Springer, 2010, Lillard & Waite, 1995, Dalgard & Håheim, 1998; Soons et al., 2009). For women, differences in sexual risk behavior between single and married persons have been found (Wayment et al., 2003). Thus, the guiding question of this section can be rephrased into the question for the impact of stable partnerships as a mediator between social and health inequalities.

Current research describes significant, yet numerically small differences in the partnership behavior according to education: People of lower status marry at somewhat younger ages than those of higher status, and their marriages are less stable (Schwartz & Han, 2014). This finding is interesting against the background of our research in that more frequently changing partners can be seen as a health risk factor, for instance for sexually transmitted diseases (Millstein et al., 1994). Both processes (stability and change) would thus be suitable for contributing to health inequalities, provided that their social stratification could be further substantiated. To our knowledge, however, there is no consistent evidence on this assumption (see the contradictory results in Kupek, 2001; Rissel et al., 2014; Tanfer et al., 1995).

More clearly, separations or divorces² are regarded in the literature as a health risk because of an observed increase in risky behaviors (e.g., alcohol, promiscuity) and psychological stress (e.g., reduced well-being, increase in depression; Leopold, 2018). A recent Iranian study of 800 divorced women (average age 38.8 years, 1–2 years after the formal divorce) shows that divorce leads to psychological strain and difficulties of adaptation, especially when perceived economic resources are insufficient (Esmaeili et al., 2015). In that study, cross-sectional multiple regression analysis finds that years of education ($\beta = -0.05$), number of children ($\beta = 0.45$), and low economic status ($\beta = 0.46$) accounted for 63.6% of the variance in women's psychological stress symptoms. Here, social and health inequalities go hand in hand.

3.2 *Empty Nest*

Another relevant biographical transition in middle adulthood is children leaving the parental home. The term “empty nest situation” to describe parents' changed life situation has been established in research.³ It is known from the literature that the majority of parents manage this transition without serious emotional, health, or economic problems (Harkins, 1978). This has been described as an effect of the historically changed child benefits. In industrialized welfare societies, children who leave parental home hardly engender a reduction of economic power for their parents. Emotional closeness can be established even after leaving, often even better than before (Papastefanou, 2000).

Social differences are therefore only associated with the children leaving home where the children have more than emotional benefits for the family. This is particularly true of traditional and rural societies and poorer social classes in industrialized societies. The empty nest situation is particularly relevant in China, for example, where it is also widely discussed (Wan et al., 2008). In that country, children are still an important source of economic support for the elderly and thus for their health. As a consequence of the one-child policy pursued for decades and a weak welfare system, two working adults have to generate the costs for four older people and one child (a so-called 4-2-1 family constellation; Wan et al., 2008). In addition, the mass migration of adult children to the cities turns aging in rural areas of China into a particular high health risk (Liu & Guo, 2008).

²We do not make any distinction between the separation of married or unmarried couples or between the transition to de facto separation versus the legal divorce of a married couple, and for the sake of simplicity we use only the term divorce.

³There is disagreement in life-course research as to how this transition should be correctly named. On the one hand, the family nest is not “empty” after the children have moved out, yet on the other hand, parents do not stop being parents when their children move out (*postparental period*). For an overview see Bouchard (2014).

In more industrialized countries, the timing of leaving parental home has not only been shifted backward (Beaupré et al., 2006); the return of adult children *into* the parental home is also increasingly being discussed. In “crowded nests,” adult children live next to their parents if, for example, the children do not have enough resources to start their own household due to poor income or economic crises. This is when the “boomers” meet the “boomerangers.”⁴ There are little data available for Europe in this respect, but some studies show that there appear to be socioeconomic factors, in addition to cultural factors, which make it more likely for adult children to return to parental home (Kleinepiper et al., 2017). Both moving out and starting one’s own household are currently becoming more problematic in industrial societies with high youth unemployment and/or high barriers to marriage (Mínguez, 2016; South & Lei, 2015). Living together with adult children seems to be rather detrimental to life satisfaction and constitutes a relevant psychological stressor (Pollmann-Schult, 2011). Also, socioeconomic change and financial resources have a lasting impact on the timing and nature of transitions. This highlights another mechanism by which social inequalities can have an impact on health inequalities.

4 Networks and Health

4.1 *Partnership Transitions as a Pivotal Point for Network Effects on Health*

Neither entering into nor dissolving partnerships takes place outside social contexts or on an “island” of isolated individuals. This metaphor is used in the fundamental work of Felmlee (2001) and Sprecher et al. (2006) on the importance of social networks for partnerships. These authors describe at least *three basic mechanisms* by which social relationship networks can influence transitions in partnerships. Firstly, networks provide opportunities for getting to know potential partners and thus determine the probability of entering into a partnership—or a sexual relationship—by means of their composition and structure. Secondly, individuals always encounter differential degrees of recognition versus rejection of their relationship decisions (e.g., choice of partner, marriage, separation) by their social networks, which makes these transitions more likely or socially supported for the individual to varying degrees. Thirdly, networks always provide more or less attractive relationship alternatives and thus are differentially (un)likely to lead to a relationship dissolution. All of these mentioned effects potentially affect individual health characteristics.

⁴This play on words used in the Anglo-Saxon-speaking world means that parents from the baby boomer generation (those born between the mid-1950s and the end of the 1960s) keep their children in the parental household more frequently and for longer periods, often as “returnees” (*boomerang*) after failed attempts to move out.

In their presentation of the state of research in this area, Sprecher et al. (2006) conclude that *approving* social networks can be regarded as conducive to the establishment and stabilization of couple relationships. Conversely, an experience of divorce or separation in the network is typically accompanied by a significant churn of relatives and married people in the network followed by increases in the sector of colleagues and singles. Not only the composition, but also the structure of the network seems to be associated with couple stabilities. The work by Widmer et al. (2004) shows that couples with *individualized* or *interfering* network types reported significantly lower couple satisfaction and stronger considerations of separation than couples with *overlapping* network types. The first pilot studies on these important interconnections between networks and couple stability and satisfaction can already be found, for example, in Milardo (1989), Levitt et al. (1986), Hansen et al. (1991), or Burger and Milardo (1995). The early study by Veiel et al. (1991), for example, showed that both the *similarity and the overlap of the partnership network* could be functional for a healthy coping mechanism with burdensome life demands.

But even beyond the stability effect of social networks on romantic relationships, there are references in the literature to a network's direct health significance *after a divorce*. The early longitudinal study by Hughes et al. (1993) interviewed 29 single American women 3 and 8 months after the legal divorce about their networks and assessed their mental health. At the interview, a high level of dynamics in the relationships between friends was reported: In the months around the divorce, the study participants had already lost an average of nearly five friends, and by the time of the second interview, another four friendships vanished. At this same time, about five new friends were included into the personal network. While the mere number of support providers in the network at the first and second interview was positively correlated with mental health at the second interview, a high proportion of parents and a low proportion of friends and siblings in the network predicted difficulties in the adaptation process and lower mental health among the divorced women. The somewhat parallel results of a study by Stone (2002) showed, on the basis of composition and support measures of the networks of 101 divorced fathers, that mental health is positively related to the number of new confidants who joined the network after divorce and the support received by them.

Kincaid and Caldwell (1991) reported a further connection between the composition of social networks and depressive symptoms after divorce. In their analysis of 56 divorced persons from the Milwaukee Family Study, they found that, in particular, those persons who had *not* submitted the divorce themselves seemed to benefit from a higher proportion of relatives in the network by reporting significantly lower levels of depression. Among the persons *who submitted* the divorce, the correlation was weakly reversed in the sense of marginally higher depression along with a higher proportion of relatives in the network.

The precise mechanisms regarding the impact of social networks on divorcees and their mental and physical health continue to be subject to further investigation, which is certainly seen and discussed in the literature (Ertel et al., 2009; Kalmijn & van Groenou, 2005). This is a promising field for future research.

Additionally, the study by Murphy et al. (1998) provided unique insight into the connection between partnership networks and mental health. This study was concerned with the way couples cope with a rare traumatic family transition, namely the violent death of one's own child at adolescence or young adulthood. The data of 261 grieving parents showed that the couple's experience of a trusting and supportive personal network of relationships tends to have a positive effect, with reduced psychological and physical symptoms and greater partnership satisfaction.

4.2 The Transition to the Empty Nest as a Pivotal Phase of Network Effects on Health

Children play a considerable role in the networks of parents and for their health, although it is not clear in which precise way they do. Parents seem to participate more strongly in society than childless people—whether in civic, political, or religious respects. This “child-effect” is largely lost when offspring move out of their parental homes (Pollmann-Schult, 2011). However, the parent–child dyads usually stay uninterrupted when the children move out, but are shifted to other channels of communication. American parents, for example, increased their electronic communication with their children for about 2 years after they had moved out (Tanis et al., 2017). Precursors of depressive illnesses, such as feelings of loneliness and abandonment, were successfully reduced by these means. In a Chinese study, it was shown that electronic communication was less satisfying for older people than direct interaction (Sun et al., 2016), although this depended on the children's accessibility. If children were spatially accessible for direct contact, digital communication was perceived as less satisfying.

Regarding changes in the extended personal networks, a study by Kalmijn (2003) showed for the Netherlands that both the number of parents' friends and the intensity of contact with them reached a significant low when children moved out—albeit the effect was numerically low. However, when the proportion of mutual friends of both parents was accounted for, the empty nest situation had a notable effect. The degree of network overlap between both parents' friends, which continuously increases over the course of a lifetime, rose significantly as soon as the children left parental home. The parents drew from the pool of so-called asymmetrical friendships, that is, those friends who were considered friends of the partner before the transition were included in the overlapping network (Kalmijn, 2003). Direct effects on health or partnership satisfaction were not reported in this study but could be hypothesized.

A mechanism by which the empty nest can interact with networks and health leads to the influence of the parental partnership. If, in the sense of the turbulence model (see Sect. 2), the parental relationship is not “reinvented” for this phase to some extent, for example in the form of time spent together with the partnership network, conflicts and separations become more likely. For a Swiss sample, Cohn-Schwartz et al. (2021) showed that fathers were more active in putting up joint social

ties after adult children left the family. In that sense, a functional parental partnership during the empty nest period meant that fathers partly took back on the role children had for facilitation of social ties before they left the household. The economic risks generally associated with divorce are also moderated by the time of separation, since with increasing age, the probability of reorientation, be it on the partnership or labor market, decreases. In partner relationships, the children's departure can therefore generate fears of dependency, especially among women (Nagy & Theiss, 2013), which can apparently have a stronger effect when the network provides little support. However, there are no studies available to date on the direct impacts of these effects on objective health measures.

5 Inequality, Networks, and Health

While there are at least some studies on the relationship between social inequality, perceived social support, and health, work on structural network parameters is less frequent. We must therefore abandon our focus on partnership transitions and empty nest situations in young and middle adulthood at this point (with the exception of some studies on the consequences of divorce at the end of this section) in order to report at least on some studies.

Overall, it can be stated in advance that the vast majority of studies on these interrelations methodically follow either a statistical moderator or a mediator approach. While mediator analyses assume an independent connection of social inequalities (in the following often abbreviated as SES for socioeconomic status) with social networks, this is not necessary in moderator models. Figure 1 graphically illustrates these two different approaches, which are also discussed in many other contributions to this volume.

Rubin et al. (2016) found a mediating effect of social networks on the connection between social and health inequalities. In their study, 316 Australian university students in their first semester were first asked to rate their SES on a scale (including income, education, and employment) compared to other people in Australia. The authors then assessed their mental health using the *Depression Anxiety Stress Scale* and an adapted version of the *Satisfaction with Life Scale*, evaluating their social

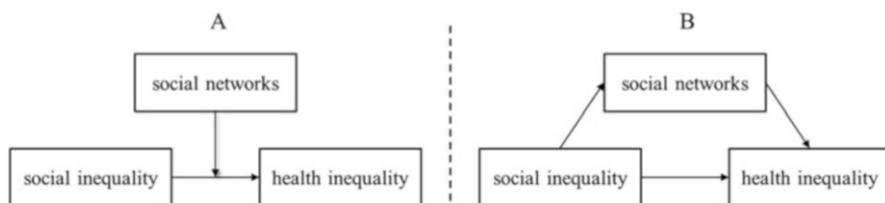


Fig. 1 Typical designs of statistical moderator (a) and mediator (b) analyses of the relationship between SES, networks, and health. Source: Own display

network based on the number of current friends at university and the frequency of weekly communication with them. One year later, the expected effects of initial SES on health measures were partially mediated by the individual measures of social networks.

Cable et al. (2013) determined the same mediation in a sample of 3000 participants of the English NCDS study. This study used education in years as the SES measure. A mental health inventory was used to measure health, while the reported number of close family members and the number of friends served as network data. Less educated people showed lower mental health scores, larger families, and smaller networks of friends. In the mediation analysis, the authors showed an independent effect of these network measures on mental health: Larger networks (independent of the network area) were considered for men, and for women, only friend sectors partially mediated the connection between SES and health.

Vonneilich et al. (2012) quantified a similar mediation effect for social networks in a longitudinal section with a Western German sample at the end of middle adulthood ($n = 4146$ participants; *Age* = 58.8 years at the second point of measurement in a 5-year longitudinal survey). The prospective and significant effects of education, income, and occupational status on the subjective health status of the participants were significantly reduced by the addition of a composite index for social embedding (the Berkman-SII-measure consisted of three indices for the number of close relationships, involvement in clubs or other groups, and marital status). The significant reductions in the direct effects by adding the SII (plus two additional measures of support) into the overall sample were 19.0% for the effect of education on health, 21.1% for occupational status, and 26.6% for income. In summary, the authors conclude that the results provide a clear indication of the mediating effect of social networks on the impact of social inequality variables on health.

By contrast, Chappell and Funk (2010) did not find this mediation regarding general health measures in a study of 916 Canadian participants in a Disadvantage Study. Inequality was measured here by income and education, while health was measured using the RAND *Health Survey Scale* and networks by the egocentric network size and the number of social clubs in which participants were involved. The analysis showed the expected effect of income on health status, but network measures did not contribute significantly to the statistical models of the analysis (no mediation).

5.1 Divorce, SES, Networks, and Health

The study by Steptoe and Marmot (2003), using the Whitehall-2 data set ($n = 227$, participants between 47 and 59 years old), also investigated the potential links between SES, divorce, networks, and health and health behavior. A psychosocial risk indicator composed of the values of personal network size, emotional support, professional, financial, and neighborly strain as well as personal coping styles

(PAVIX; high values represent the respective risk characteristics of the indicators, with a small network size being considered a risk factor) initially correlated negatively with SES. A lower SES was associated with higher psychosocial risk as already described in Sect. 3 based on the studies of Mielck and others. In addition, corresponding with the aforementioned healthy marriage hypothesis, married persons were significantly less affected by higher psychosocial risk than unmarried persons (including divorcees). In a regression model using all of these variables to predict individual health status (e.g., depression, sleep disorders, hopelessness, subjective feeling of healthiness, etc.), only the PAVIX-index remained a significant predictor. Neither SES nor marital status remained significant health predictors after inclusion of PAVIX. The same results were found for physiological health measures, but not for health behavior itself. These findings can be interpreted as a complete mediation of the health effects of SES and marital status via *psychosocial (network) resources*, which was interpreted by the authors as an argument for strengthening these aspects in future health research and practice.

In a Dutch study (Terhell et al., 2004), personal networks of 104 divorced men and women were observed over a total average period of 11.7 years (from 4.2 months [T1] and 1.1 years [T2] up to 12.1 years [T3] after divorce). In addition, the year prior divorce [T0] was assessed retrospectively. The authors distinguished four different patterns of network changes in their sample by a cluster-analytical approach: a significant and permanent reduction of the network at all points in time (Cluster 1, 38.5% of the sample), a reduction of the network in the year after the divorce with subsequent recovery almost to the starting level (Cluster 2, 28.8%), a short-term increase in the network size in the year after the divorce with subsequent falling below the starting level (Cluster 3, 14.4%), and a significant and permanent increase in the network at all points in time (Cluster 4, 15.4%). What is particularly interesting for our topic is that neither education nor mental health (operationalized by measures of self-esteem and emotional stability) differed significantly between these four clusters, but only gender, age, and divorce characteristics did so.

Symoens et al. (2014) arrived at somewhat similar results with data from the European Social Survey (ESS-3, $n = 18,376$ 25–60-year-olds ever married). They measured social network characteristics by the number and frequency of personal confidants and neighborhood contacts (e.g., “how close the respondent feels to people in the local area,” p. 203, or “how often the respondent meets with friends, relatives, or colleagues,” p. 208). They first found the expected differences in mental health between divorced and married people (effect size $d = 0.28$, $p < 0.001$), but they reported that these differences were halved in value when network measures were included into the regression. Similarly, educational years—as an indicator of SES—impacted depression scores (no values reported in the primary study) but remained significant predictors when network measures were included (beta = -0.26 , $p < 0.001$, in a multiple regression of depression to dependent variables). Symoens and colleagues concluded that “the benefits of having a confidant and of regular social contact in terms of depressive feelings are also more pronounced in the divorced than in the continuously married population” (p. 208). Even given that the network measures applied were rather simple, these captured

relevant aspects of social networks go beyond the usual support questions and also show moderator effects between socioeconomic status and mental health.

6 Conclusions and Outlook

The reported studies show that, on the one hand, there is an effort in research to decipher the *black box* “networks” in its significance for health inequalities more precisely, but that, on the other hand, there is still a considerable need for research beyond the usual research on perceived support or the mere size of family or friendship sectors. So far, no uniform picture has emerged on the relationship between social and health inequalities and social networks or transitions in young and middle adulthood.

Current empirical research mostly applies a statistical moderator or mediator model outlined above in Fig. 1. This seems to us—against the background of the introductory network theories—a worthwhile and theoretically justified research approach that should be pursued further. In most reported theories, social networks unfold their strongest health support precisely when they consist of the *appropriate network partners and structures for a specific phase of life or biographical transition*. It can be assumed that it is possibly a transition-network-fit model that will emerge as a best explanatory factor of health effects in young and middle-aged adults. Some studies have already shown that, for example, friends or family sectors of the network can have very differential effects on individual health. These sectoral effects need to be further specified and researched—specifically for distinct biographical phases and transitions. As an aside, it is worth mentioning here that these future research approaches should also focus more attention on negative and stressful relationships. Social relationships are not only supportive but sometimes also a source of conflict and strain (see Rook et al., 2004; Adebahr, 2022).

According to the research literature, the health dynamics of adulthood seem to be less the result of rather slow biological changes than of a multitude of transitions that have to be managed and are linked to bear both economic (inequality) and social risks (e.g., network churn). In developmental psychology, there are a number of specific studies on this, but only a few overarching theories that are suitable for describing this *phase of life* in a generalized fashion. Both the theory of socio-emotional selectivity and the convoy theory (see Sect. 2), however, assume *an overarching developmental task*—the construction of social networks *adequate to a specific phase of life*. According to these theories, a success of personal network construction would predict a more favorable prognosis for health outcomes; a poorer network composition would accordingly be associated with a less favorable prognosis and engender lesser degrees of mental health (e.g., depression), health behavior (e.g., sports club memberships), and, consequentially, physical health. However, dimensions of inequality are often not sufficiently considered here, just as the networks are not described in sufficient detail. We hypothesize, however, on the

basis of the first studies reported that functioning social networks could mitigate the detrimental impact of low SES on health.

We hold an optimistic outlook for further research efforts, because these interrelations are increasingly witnessed. Alwin et al. (2018a, 2018b), for example, emphasize in the introduction to the current volume on “Social Networks and the Life-course” that “the understanding of social networks can improve the understanding of the life-course, and *vice versa*” (p. 4). The necessary extension of this statement by health outcomes and health inequalities is obvious, in our opinion. In the introduction to the volume “Life-course Health Development,” Halfon et al. (2018) present the “emerging field of life-course health development” (p. 2), in which health inequalities, but not social relationship contexts, are mentioned. The obvious triad of life course, relationship networks, and health inequalities thus represents a logical development of existing research.

Studies that could address this should therefore meet various requirements, some of which are listed here. We start with seven general methodological requirements and then go on to address the transitions discussed in greater detail.

1. Firstly, hardly any of the studies presented refer to any advance life course theory. Many studies are of a descriptive nature. To our opinion, each of the developmental psychological theories presented at the beginning has the potential to generate hypotheses regarding the relationships discussed. All developmental theories, in turn, are embedded in a bio-psycho-social model in which complex causal relationships apply (also see chapter “[Social Network Theories: An Overview](#)”).
2. From this, we conclude that future studies should be interdisciplinary in nature. All factors—including biological ones—can be variable and should be modeled accordingly. For example, the samples should be large enough to be able to model even rare phase-specific health transitions (such as infections with sexually transmitted diseases, for example, after the separation of a partnership) in such a way that pre-morbid or distal factors (e.g., network changes) can be modeled sufficiently (compared to separated adults without infection). Here, the cooperation of sociologists, psychologists, and physicians (ideally: repeated mass screenings) is necessary. When planning the measurement intervals, some factors do not have an immediate effect, but take effect after a certain period of time. For example, allostatic stress caused by the loss of social relationships only takes effect after some time and depends on individual coping patterns and opportunities (such as neighborhood effects).
3. Future studies should be designed as longitudinal ones, as this is the only way to analyze causal mechanisms in the context of inequality, networks, transitions, and health. Questions should always be formulated in a cross-lagged design, for example, whether poor physical health predisposes people to belong to a lower income class or vice versa. In complex longitudinal models, networks can be considered both as causes, moderators, or mediators, but also as dependent variables.

4. The samples should be large enough to reflect sufficient variance both in the dimensions of inequality and in network development. Proximal factors, such as constitutional physical resources,⁵ health behavior, personality, or parenting practices explain many of the health inequalities, so samples that allow multi-level analyses are required to demonstrate the effects of more distal factors. For example, to statistically separate network influences from social inequalities, large sample sizes within any income group are needed so that network parameters can vary sufficiently.
5. Since social change has a significant impact on the nature and timing of transitions, it should be part of the model and sampling design. The latter is achieved by cross-sequential designs in which different age cohorts stand for different change effects.
6. Studies on adulthood development should aim at capturing the timing (and hence the sequence) and changing contexts of transitions (as time-dependent covariates) as well as the objective (e.g., loss of workplace, change of residence) and subjective factors (e.g., stress-perception and coping styles) of biographical transitions.
7. Social networks should be recorded in-depth. The studies discussed in this chapter have often taken into account rather crude network variables, such as the number of friends or contact intensities. The question of whether biographical transitions also lead to changes in the wider understanding of networks, for example in the relationships between the network partners themselves, has not been answered in any of the reported studies thus far. However, the relationships in the wider network should be regarded as part of the social context and capital of a person; even interrupted dyads in alters' relationships can have transition-related health or economic consequences.⁶ Here, existing theoretical approaches need to inquire into the entire network.

So far, the authors are not aware of any study that could meet all of these requirements. In addition to these general points of outlook, there are other open research questions regarding the individual transitions, some of which will be addressed.

The impact of the transition to an empty nest on the network of relationships has so far been presented in a less differentiated manner for industrial societies than for emerging economies. In Germany, for example, more educated mothers have their children leave at an older age than those with less education, and they keep them in

⁵This refers primarily to genetic resources. Their inclusion in interdisciplinary studies requires genetically informative designs with simultaneous collection of classical sociological indicators in large samples. One example of such research in Germany is the TwinLife study (<http://www.twin-life.de/de>), which unfortunately does not yet examine middle adulthood.

⁶If, for example, the children's departure coincides with the separation of their parents, the use of parental "relationships" with remote network persons by the departing children, for example, for education or housing, may become less likely. It could also be said that the separation of the parents reduces the availability of their "second-hand social capital" (Shah et al., 2018) for the children.

their family longer due to extensive education. Here, a special interaction between biological age, educational level, and transition becomes apparent, because individuals who, for example, enter into parenthood not before the age of 40 will not experience the empty nest situation until the age of 60 or 65 (including the corresponding risk of late divorce). At this age, however, age-specific reductions in the network of relationships are more likely to occur (see chapter “[Social Networks and Health Inequalities in Old Age](#)”). On the other hand, in the course of societal change (e.g., an increasing income gap), financial resources are likely to diminish for poorer social strata, making crowding-in phenomena and involuntarily prolonged parent–child phases more likely. To what extent parents then adapt to, for instance, disappointed parental expectations of a “second youth” (no renewed partnership or parenthood, since the network does not expand without the children moving out) could determine whether or not health problems aggravate. These potential interactions between the topics outlined in Sect. 1.2, which are only mentioned here, illustrate some of many future research directions.

A similar need for clarification with regard to possible interactions can be observed regarding future changes in marriage and/or divorce behavior. While the work of the research groups around Felmler (2001) and Sprecher et al. (2006) can show that networks continuously accompany couples’ lives, the questions remain unanswered as to whether social and health inequalities occur in parallel. Do the social networks of unattached people, LAT couples, or never-married and separated singles play the same role for all groups and for all aspects of mental and physical health as well as for the reproduction of health inequalities, or is it worth taking a closer look? Here too, there is no conclusive answer.

From the perspective of inequality, however, the idea of the Matthew principle is obvious to us: Individuals who live in healthier, more relationship-satisfied and resource-rich networks at the beginning of their life span will possibly become even healthier, more satisfied with relationships, and more supported than others during the course of their lives. However, these are relevant starting points for further investigation into the interplay of these factors and for health prevention.

Reading Recommendations

Alwin, D. F., Felmler, D. H., & Kreager, D. A. (Eds.) (2018). *Social networks and the life-course: Integrating the development of human lives and social relational networks*. Springer. *This recent volume presents the state and perspectives of the innovative synthesis of life-course and network research in 22 chapters.*

Halfon, N., Forrest, C.B., Lerner, R.M., & Faustman, E.M. (Eds.) (2018). *Handbook of life-course health development*. Springer Nature. *This recent volume presents the state and perspectives of the new research area LCHD (Life-course Health Development) in 26 chapters.*

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Kalmijn, M. (2003). Shared friendship networks and the life-course: An analysis of survey data on married and cohabiting couples. *Social Networks*, 25, 231–249. *This study already fulfills many of the perspectives opened up in this chapter, because it is oriented towards the entire adult life-course and describes eight different transitions in their associations with the network of friends on a large sample (N = 2977). It is theoretically oriented (interrupted dyads, balance theory) and takes into account various socioeconomic variables on a cross-sectional basis, without focusing on health in the stricter sense. Thus, it cannot make any statements on changes in health inequalities, but provides a good orientation for further research.*

Wrzus, C., Hänel, M., Wagner, J., & Neyer, F. J. (2013). Social network changes and life events across the life-span: A meta-analysis. *Psychological Bulletin*, 139(1), 53–80. *A significant meta-analysis of the change in egocentric relationship networks from childhood to senescence with a large number of primary studies (k = 243).*

Data Sets/Overview

- **“General Population Survey in the Social Sciences” (ALLBUS).**

Since 1980, representative data on attitudes, behavior, and social structure of the population in the Federal Republic of Germany have been collected on a cross-sectional basis, usually every 2 years. The database contains some indicators on social inequality, health and health behavior, social networks, and social capital. <http://www.gesis.org/allbus/allbus>

- **Studies from the Health Monitoring of the Robert Koch Institute: “Study on the Health of Adults in Germany” (DEGS) and “Gesundheit in Deutschland aCTuell” (GEDA)**

In a combination of cross-sectional, longitudinal (DEGS) and cross-sectional data (GEDA), extensive representative health data of the German resident population have been collected every 2 years since 2008, some of which include medical examination data. Various indicators on social inequality and social support are included to varying degrees. <http://www.degs-studie.de> and <http://www.geda-studie.de>

- **“Socio-Economic Panel” (SOEP)**

An annual, longitudinal representative survey of the adult population of Germany (continuous since 1984 and 1990 in West and East Germany, respectively). It focuses on the social and economic situation of the population

(continued)

but also regularly includes psychological and network indicators in the survey.
<http://www.diw.de/de/soep>

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Social Networks and Health Inequalities in Old Age



Britta Müller and Lea Ellwardt 

Overview

- Health and social networks are central domains in later life.
- There are three hypotheses on the social gradient of health in old age: continuity, divergence, and convergence hypothesis.
- One of the most important hypotheses on social networks in old age is the activity hypothesis. It states that high life satisfaction can be achieved by maintaining social interactions.
- Risk of mortality, dementia, and depression are associated with both socioeconomic status and social network characteristics.
- The mediating mechanisms of socioeconomic status, health, and social network cannot yet be adequately explained by existing studies.
- The majority of network characteristics are collected indirectly through proxies. Established quantitative and qualitative methods of network analysis have played a subordinate role in gerontological research so far.
- Research designs that focus solely on qualitative or quantitative network characteristics systematically underestimate the real effect of social integration on health in old age.

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1 Introduction

Thanks to improvements in living standards and health behavior as well as medical progress since the second half of the twentieth century, old age has become a life phase in its own right. This phase usually begins by the transition from working life to retirement (Kohli, 2000). Both the chance of reaching retirement and the life expectancy after retirement have increased significantly (Eisenmenger & Emmerling, 2011). The post-work phase spans several decades for many people now. In addition, people who retire are considerably healthier and more independent than their peers of earlier birth cohorts (Crimmins, 2004). The expansion of this phase of life has been accompanied by a differentiation of older people in terms of health and independence: healthy and active people experience this phase, as do people in need of help and care. This fact is considered by distinguishing between old and very old people (Baltes, 2007). Characteristics of *old age* are absence of non-compensable health restrictions, self-determination of various activities (e.g., traveling, hobbies, voluntary work), and strong social integration. Overall, the demands of old age can be coped well in this phase. *Very old age* is characterized by an increase in physical and cognitive losses and diseases, and a decrease in the abilities and possibilities of compensating for deficits (Baltes, 1997; Baltes & Smith, 2003).

Health and social networks become central domains of life in old age and show special characteristics compared to earlier life phases. The risk of diseases with slow progressions, which often cannot be completely cured, increases. The causes are the rise in age-physiological changes, the accumulation of risk factors during the life course, and long latency periods concerning diseases that have already started at an early age (Tesch-Römer & Wurm, 2009). In addition, multimorbidity, that is, the simultaneous occurrence of several chronic diseases, occurs more frequently with increasing age, which threatens functional health (Müller et al., 2014). Furthermore, the importance of subjective health increases with age. Compared to objective health, subjective health is a more reliable measure of quality of life, life expectancy, and the prognosis of disease progression in old age. In comparison to disease diagnoses, subjective health, which includes not only physical and mental health but also one's own life situation and lifestyle, reflects the individual state of health more comprehensively (Spuling et al., 2017).

The structural and functional patterns of social networks in old age are mainly shaped by the status transition from working life to retirement and by the health of the older person and their contacts in the network. Health is especially important for the social network in later life, compared to young and middle adulthood (Hoogendijk et al., 2016). One's social network in old age is significantly changed by the death of important network members, functional limitations, or the need for care. For example, from the age of 60 to 65 years and older, the decrease in network size is estimated at one person per decade (Wrzus et al., 2013).

2 Theories

2.1 *Theories on Health Inequalities in Old Age*

Three assumptions on the association between social inequality and health in old age are often discussed. The *continuity hypothesis* assumes a continuation of health inequality: The extent of health inequality in old age corresponds to the extent in earlier life phases (Atchley, 1989). It assumes that social inequality in retirement is reproduced from the social inequality of the working phase (Kohli, 2000). The socioeconomic position that a person reaches in the course of his or her life by following educational and occupational paths is maintained in old age. This implies a temporal stability of social inequality within a cohort until old age (status-maintenance hypothesis) (Henretta & Campbell, 1976). It also implies a constant effect of social inequality on health. The *divergence hypothesis* assumes an increase of health inequality with age. It is the result of an accumulation of health risks in lower status groups over the course of life (Tews, 1993). Furthermore, in the case of poor health, compensatory resources (such as income) are unequally available in the different social strata (Mayer & Wagner, 2010). This process is intensified when material resources of higher status groups accumulate over time (cumulative-advantage hypothesis) (Lampert et al., 2017). The *convergence hypothesis* takes the opposite position. It states that health inequality decreases with age. Four arguments are used to support this hypothesis. Firstly, biological aging processes are universal, so that the influence of social factors on health and life expectancy increasingly vanishes (Age-As-Leveler-Hypothesis) (Lampert et al., 2017; Mayer & Wagner, 2010). Secondly, welfare state regulations reduce differences in socioeconomic status and its influence on health (von dem Knesebeck et al., 2003). Thirdly, burdens of middle age (e.g., as a consequence of employment), which vary according to social class and influence health status, become less important with retirement (House et al., 1992). Fourthly, the convergence theory is justified by socially selective mortality: The risk of dying before retirement age is greater in lower status groups than in higher ones. Thus, survivors in the lower status groups represent a positive selection with regard to health status (Markides & Machalek, 1991; McMunn et al., 2008).

2.2 *Theories on Social Networks in Old Age*

An early sociological theory on social networks in old age constitutes the *disengagement theory*, which bases on structural functionalism (Cumming & Henry, 1961). It assumes that a successful adaptation to old age is achieved by “disengagement,” understood as the withdrawal of older people from social roles and relationships. Functional complementarity between individual and society is assumed. The desire for retreat corresponds with the society’s need to ensure its continued

functioning. The process of disengagement is neither due to poor health nor to loss of income in old age. Rather, it starts as soon as the person relinquishes his or her professional role or becomes a widow. Life satisfaction is experienced by the fact that the withdrawal reduces social control, for example, by colleagues and superiors, which entails liberation from everyday norms. Only in those cases in which no alternative social roles are available, such as voluntary work, the reduction in the number or diversity of social contacts is seen as a crisis. There is little empirical evidence for this theory. Although important social roles do indeed disappear with the end of employment and through widowhood, existing social contacts, for example, with children, grandchildren, and neighbors, are not loosened but, on the contrary, often intensified. A voluntarily initiated withdrawal from social ties in good health is not typical (Maddox & Eisdorfer, 1972; Neugarten et al., 1969; Shanahan et al., 1968).

The activity theory can be regarded as an alternative to the disengagement theory. It states that high life satisfaction in old age is achieved through continued social activity, the maintenance of interactions, or an active lifestyle. The age-related loss of social roles (e.g., professional activity) and social activities should be countered by taking up new activities (e.g., voluntary work) (Tartler, 1961). This connection between activity and satisfaction in old age is empirically well established (Adams et al., 2011; Katz, 1996; Lemon et al., 1972). According to *social exchange theory*, which is based on *rational choice theory*, interactions take place through a norms-driven exchange of social goods (instrumental, emotional, and material). The reciprocity norm is regarded as central. Concerning old age, the theory assumes that older people have fewer and fewer resources such as social position, money, and health, and thus lose their attractiveness for potential exchange partners (Bengtson & Dowd, 1981). Ways out of the imminent imbalance between giving and receiving are seen in the focus on those interaction partners with whom reciprocity is possible. This can be through targeted selection of existing relationships or the establishment of new ones, which is ultimately seen as positive for well-being. Criticism of this theory is directed primarily at the difficulty of empirically testing these assumptions, since “social goods” can mean very different things to individuals. Moreover, the interpretation of reciprocity also depends on the quality and significance of social relations. However, quality is not taken into account in the theory of social exchange (Tesch-Römer, 2010).

The *model of inter-generational solidarity* (Bengtson & Roberts, 1991) and the *model of inter-generational ambivalence* (Lüscher, 2000) are specifically geared toward the relationships between parents at an advanced or old age and their adult children. The former model focuses on the mutual support between the generations in a family, described by means of seven dimensions: “structure” (in the sense of opportunity structures for interaction), “association” (extent of personal contacts), “affect” (extent of mutual affection), “consensus” (extent of agreement between values and attitudes), “normative beliefs” (strength of commitment), “functional exchange” (degree of mutual support), and “conflict” (frequency of conflicts). The latter model assumes a contradiction in social relationships between parents and adult children and formulates assumptions about how to resolve it.

Structural change of social networks in old age is explicitly addressed by the *socioemotional selectivity theory* (Carstensen, 1993) and the *social convoy* (Antonucci et al., 1997). The former theory assumes that life satisfaction and positive feelings remain stable into old age despite the shrinking networks because there is an increasing focus on interaction partners who are the source of positive experiences. This selection process is regarded as functional for mental health. The second theory states that the inner core of the network, which includes partners, children, parents, and close friends, accompanies a person over the course of life, while the outer core, consisting of neighbors, service providers, and work colleagues, is characterized by substitution. Here, the network does not shrink per se, but rather changes in terms of its composition. Thus, contact with (former) work colleagues may decrease and contact with neighbors and caregivers may increase. Among other things, substitution is an expression of changing opportunities and needs in old age. According to the social convoy model, even distant, less emotionally regulating contacts can thus be functional for physical and mental health in old age.

3 Social Inequality and Health

While there is a long-established correlation between socioeconomic status and health in middle adulthood, age is considered a relatively young field of research (von dem Knesebeck & Vonneilich, 2009). The following presentation focuses on three consequences of social inequality that are mainly relevant in old age. These are differences in the risk of mortality, in the age-related decline in cognitive functioning with its associated risk of dementia, and in the risk of depression.

3.1 Mortality Risk

According to empirical results from the German Ageing Survey (DEAS), in old age, socioeconomic status has a continued influence on health (Schöllgen et al., 2010; Spuling et al., 2017). This, in turn, is potentially related to socioeconomic/social inequality in mortality. For example, according to register data from 2003, the mortality risk among male German pensioners aged 65 and over was three times higher in the lowest socioeconomic fifth (quintile) than in the highest; the further life expectancy was 12.5 years versus 20 years (Shkolnikov et al., 2007). Yao and Robert (2008) found similar disparities in their US long-term study in an older population of 1631 people aged 60 and over: Black seniors had worse subjective health and a higher risk of mortality than White seniors. This difference can be partly explained by a lower socioeconomic status of Black seniors both at the individual and neighborhood level. Lleras-Muney (2005) also showed a causal relationship with census data from 1960, 1970, and 1980 in the USA: With every additional year

of education, the probability of adult mortality fell by 3.6% within the next 10 years. This trend of inequality is not limited to Germany and the USA: In an international comparison of 22 European countries, Mackenbach et al. (2008) have impressively shown that people with a low socioeconomic status are systematically exposed to a higher risk of dying than people with a higher socioeconomic status. The age-adjusted status-based difference in mortality risk was particularly high in the Eastern European and Baltic countries (e.g., Czech Republic and Lithuania) and lowest in the southern countries, such as Italy and Spain. The analysis referred to almost 3.5 million deceased people with a minimum age of 30 years from official death registers.

3.2 *Cognitive Progression and Dementia Risk*

There is consensus that cognitive abilities, which include the dimensions “language,” “memory,” “knowledge,” “problem solving,” and “orientation,” show a high inter-individual variability in old age (Christensen et al., 1994). In addition, abilities vary according to the respective areas of performance. Age-related differences in the dimensions “problem solving” and “memory” are much more pronounced than in “acculturated knowledge” (Finkel et al., 2007; Reischies & Lindenberger, 2010).

If the decline is pathological, that is, it decreases beyond a normal age-related decline in cognitive functioning and is medically diagnosed, then it is called dementia. Dementia is a psychiatric condition that occurs in degenerative and non-degenerative diseases of the brain. A disease most commonly associated with symptoms of dementia is Alzheimer’s disease. Dementia is characterized by severe impairment of memory (especially short-term memory), speech, motor skills, and sometimes personality structure. The risk of dementia increases exponentially with age. For example, the prevalence of Alzheimer’s type dementia is estimated to be 1% in the group of 60-year-olds and doubles every 5 years thereafter (Ferri et al., 2005). From the age of 85 onward, risk of dementia is drastically increased and measures about 25%. The cognitive processes and the risk of developing dementia—a possible but not inevitable consequence of an unfavorable trajectory—are determined by a variety of social and socioeconomic factors (Müller & Kropp, 2011, 2012).

Probably the strongest factor in this respect is intelligence or intellectual capacity, often measured by educational attainment in surveys. The *cognitive reserve hypothesis* (Liberati et al., 2012; Scarmeas & Stern, 2003) assumes that people with higher educational attainment and occupational status have a larger repertoire of coping strategies that delay and mitigate the decline in cognitive functioning in old age than people with lower educational attainment. This implies that alternative regions of the brain are more likely to be activated when needed, to take over the functions of less efficient regions affected by dementia or Alzheimer’s disease. Not education per se, but the associated potential for intellectual stimulation by the social and professional

environment is seen as an explanation (Gow et al., 2012; Lee & Chi, 2016; Then et al., 2013; Wang et al., 2012).

The association between education and risk of dementia is empirically well established: According to a meta-analysis of 69 studies, older people with a low level of education have a 1.61 times higher risk of developing dementia than older people with a high level of education (Meng & D'Arcy, 2012). An interesting finding is the so-called hurdle effect: greater cognitive reserves delay the diagnosis of dementia, but once dementia sets in, it progresses faster. This is because the compensatory processes of the cognitive reserve mask the decrease in cognitive functions for a long time. However, by the time the decline is clinically diagnosed, the pathological processes may have manifested (Bruandet et al., 2008).

Cognitive reserve is closely related to a stimulating social environment. Several theoretical approaches therefore explicitly postulate a relationship between social embedding and cognitive functioning. First of all, the *use-it-or-lose-it hypothesis* (Hultsch et al., 1999) expects that the brain, similar to a muscle, needs to be trained regularly to remain fully functional. Social relationships help by stimulating people to engage in social and physical activities [physical activity is another predictor of cognitive function (Fratiglioni et al., 2004)] and provide complex intellectual input (Schooler, 1984). The *stress buffer hypothesis* (Fratiglioni et al., 2004) assumes a positive effect of emotionally supportive relationships in times of crisis. Stress is considered a factor promoting Alzheimer's disease because it is associated with structural changes in the hippocampus (Wilson et al., 2003). According to this hypothesis, people benefit particularly from so-called functional networks rich in support, regardless of the actual number of relationships or network size. The *main effect hypothesis* (Cohen, 2004) assumes that highly integrated people have more motivation (also norms and social pressure), knowledge, and resources for a healthy lifestyle. In this hypothesis, so-called structural aspects are also relevant, such as embedding in complex and diverse networks of relationships. All three hypotheses are complementary in their predictions, as they focus on different mechanisms that can be effective simultaneously.

3.3 Depression

Depressive disorders are characterized by a state of distinctly sad mood, disinterest- edness, and reduced drive over a long period of time. In old age, depression is the most common mental disorder. Luppá et al. (2012) in their meta-analysis of older people aged 75 years and older show prevalence of 17% for depressive symptoms and 7% for major depression. Depression in old age increases suicidal mortality, is associated with losses in subjective and functional health, and often affects the outcome of treatment for somatic disorders. Depression is also a risk factor of coronary heart disease (Carney & Freedland, 2017). There are links between depression and neurodegenerative diseases, such as Alzheimer's dementia and Parkinson's disease (den Brok et al., 2015; Mourao et al., 2016). Chronic pain in old age

increases the risk of depression (Zis et al., 2017). Lorant et al. (2003) found convincing evidence in their meta-analysis, which included people in old age, that low socioeconomic status is associated with a higher risk of depressive disorders. Although the studies included in the meta-analysis show both directions of the association (socioeconomic status influences the risk of depression in the sense of the causation hypothesis; depression causes socioeconomic status in the sense of the drift hypothesis), most of the findings of this meta-analysis support the causation argument. Current studies on aging confirm the findings of a social gradient in depression (Domènech-Abella et al., 2018; Han et al., 2018; Lei et al., 2014; McEniry et al., 2018). Of particular interest is the result of a Japanese study, in which the authors demonstrate the late effects of early life experiences: People who grew up in families with a low socioeconomic status had a 44% higher risk of developing depression decades later, in old age, than those whose parents had a high socioeconomic status (Tani et al., 2016).

4 Social Networks and Health

Researchers have investigated a wide range of health parameters in relation to social networks in old age, with a particular focus on mortality risk, cognitive processes, and depression. Selected studies on these three focal points are presented below.

4.1 *Mortality Risk*

Network embeddedness is associated with risk of early mortality. This conclusion was reached by Holt-Lunstad's research team in their meta-analysis of 70 studies on subjective and objective social isolation (Holt-Lunstad et al., 2015): Loneliness increased the risk of mortality by 26% as compared to social integration (i.e., absence of loneliness), and living alone increased the risk of mortality by 32% as compared to not living alone. This result builds on an earlier meta-analysis by Holt-Lunstad: Across 148 studies she found a 50% higher probability of mortality for weakly embedded persons compared to strongly embedded persons (Holt-Lunstad et al., 2010). Embeddedness was measured by functional (e.g., receiving social support, loneliness) and structural network measures (e.g., number of social relationships, household size). This difference in mortality, which is roughly comparable to the health risk of smoking and class III obesity, was consistent across age groups, gender, original health status, cause of death, and observation period of the studies. Interesting differences were found with regard to the network measures used: the relationship between embeddedness and mortality was strongest when functional and structural networks measures were combined.

4.2 *Cognitive Trajectories and Risk of Dementia*

Several meta-analyses have already summarized the impressive number of studies on social integration and cognitive functioning. In a meta-analysis by Kuiper et al. (2015), three out of 43 studies showed a significant correlation between *cognitive decline* and network size. Older people with smaller networks showed a stronger decline in the observation period than older people with larger networks (Chi & Chou, 2000; Holtzman et al., 2004; Hughes et al., 2008). This association was stronger than for functional aspects such as low social activity.

In another review of 19 longitudinal studies, Kuiper et al. (2015) found a positive correlation between the *risk of dementia* and low social participation, low frequency of contact, and high levels of loneliness. The authors compared the effect sizes with those of low education, low physical activity, and depression. However, results on network size and satisfaction with the network remained inconsistent, as no significant correlation was found: Only two out of the eight studies that considered network size showed an increased likelihood of dementia—in older people with small networks (James et al., 2011; Saczynski et al., 2006).

Fratiglioni et al. (2004) came to a similar conclusion in their meta-analysis of 13 studies. Three out of six studies that analyzed social networks found a reduced risk of dementia for highly socially integrated people (Fratiglioni et al., 2000; Scarmeas et al., 2001; Wang et al., 2002). Five out of seven studies found a lower decrease in cognitive functioning. In addition, the reverse causal relationship is also shown: When cognitive abilities decrease strongly with age, the size of the social network shrinks (Aartsen et al., 2004) because the social and physical radius of action is reduced. Increasing cognitive impairments can thus encourage a retreat into family relationships.

4.3 *Depression*

In their systematic review, Schwarzbach et al. (2014) analyzed a total of 37 studies that examined the association between social networks and depression in older people. While findings on functional network aspects were generally consistent (little social support and low relationship quality are associated with depression), findings on structural aspects (such as marital status, network size, and frequency of contact) were mostly heterogeneous. In contrast, it was unanimously shown that people living alone do not have a higher risk of depressive symptoms. To some extent, relationships are moderated by the cultural context. In Eastern cultures such as in China and Japan, for example, a high contact frequency was associated with a lower risk of depression. For Western cultures, however, this correlation could not be confirmed. Antonucci et al. (1997) found evidence in their analysis that functional and structural network aspects each have independent effects on depressive symptoms in old age. Litwin and Stoeckel (2016) have shown the significance of social

networks for the relationship between functional impairments and depressive symptoms in their work. They found that functionally impaired people have more depressive symptoms when they have no social network than impaired people with network partners.

5 Social Inequality, Social Networks, and Health

Studies analyzing the relationships between social inequality, social networks, and health in old age are comparatively rare. They consider both functional (i.e., all forms of support) and structural (i.e., network size and frequency of contacts) aspects. The following presentation of existing findings is structured along three hypotheses:

1. Characteristics of social networks mediate the association between socioeconomic status and health; that is, socioeconomic status affects health status via social networks.
2. Characteristics of social networks moderate the association between socioeconomic status and health; that is, network characteristics influence the strength of the association between socioeconomic status and health status.
3. Socioeconomic status moderates the association between social networks and health; that is, socioeconomic status influences the strength of the association between network characteristics and health status.

5.1 *Social Network as Mediator*

Using a German sample of persons aged 60 and over living in their own household, Von dem Knesebeck (2005) tested the hypothesis that social networks mediate the relationship between socioeconomic status and health. Dependent variables regarded subjective health, depressive symptoms, and functional limitations. Socioeconomic status was measured with education, income, and occupation. The two proxies “frequency of contact with friends/acquaintances” and “frequency of contact with family members” as well as the perceived availability, use, and adequacy of emotional support mapped the social network. The results overall showed weak mediating effects of social networks on the social gradient of health: Controlling for “frequency of contact with friends,” “frequency of contact with family,” and “availability of emotional support,” both the positive correlation between income level and subjective and functional health and the negative correlation between income level and depressiveness decreased only slightly and remained significant. Correlations between education or occupation and the three health indicators became even stronger after controlling for the aforementioned network characteristics (von dem Knesebeck, 2005). Depressive symptoms were further examined in the Korean study

by Han et al. (2018). The authors showed that reciprocity of social exchange mediates the association between household income and depression. Vonneilich et al. (2012) investigated subjective health in the German Heinz Nixdorf Recall Study. Data stem from baseline and a 5-year follow-up (4146 men and women aged 45–75 years). Structural characteristics were measured with the “Social Integration Index” (SNI) (Berkman et al., 2004). Functional characteristics were measured with the “New Haven Established Population for Epidemiologic Studies of the Elderly Questionnaire” (EPESE) (Seeman & Berkman, 1988). Both structural and functional network characteristics mediated the association between socioeconomic status and subjective health. In contrast, in the prospective follow-up study (observation period of 3 years) by Nilsson et al. (2010) no mediator effects were found for the social network in the association between socioeconomic status (measured with financial assets) and functional health (measured with the number of mobility activities that can be carried out without help from others). Network indicators included cohabitation, social participation, network diversity, and satisfaction with social contacts (Nilsson et al., 2010). Neither did the study by Yan et al. (2013), which was based on a follow-up study covering an observation period of 11.5 years, support the mediator hypothesis. Their American sample consisted of 64–100-year-old persons. The authors examined the prevalence of ischemic stroke in relation to socioeconomic status of the residential area (i.e., neighborhood socioeconomic status). Network characteristics were assessed using the “Interpersonal Support Evaluation List” (Cohen et al., 1985), which measures the perceived availability of social support, and the “Lubben Social Network Scale” (Lubben, 1988). The latter is a tool especially developed for the elderly population, which in addition to emotional and instrumental support also asks for the actual size of the network. In summary, the reported findings do not provide a clear answer to the question of a mediating effect of structural network features in old age.

5.2 *Social Network as Moderator*

Using data from the fourth wave of the SHARE study (Survey of Health, Ageing, and Retirement in Europe), Olofsson et al. (2018) investigated the moderating effects of social networks. The sample consisted of 54,751 people aged 50 years and older from 16 European countries. Central indicators concerned education and subjective health. Network size and satisfaction with the social network were assessed with a network generator. The results point to a moderating effect of network satisfaction among men and women in Northern Europe: The correlation between socioeconomic status and health is stronger when satisfaction is high, but weaker when satisfaction is low. The authors argue that especially people with lower education seek and find help in the social network (which is associated with high satisfaction) when they are in poor health. Furthermore, it is assumed that low satisfaction with network contacts can be the result of emotionally stressful relationships that weaken well-being and reduce the social gradient (Olofsson et al., 2018).

This study supports the hypothesis of the moderating effect: The social gradient is more pronounced when satisfaction with the social network is high.

5.3 Socioeconomic Status as Moderator

Using longitudinal data from the MacArthur Study of Successful Aging, Unger et al. (1999) examined the role of socioeconomic status (measured by income) for the influence of social networks on changes in functional health over a 7-year period. The sample included people aged 70–79 years. Network measures captured structural and functional characteristics of social networks. People with a larger social network had less functional impairments than those with a small network. This association was particularly pronounced among men. However, income did not operate as a moderator variable. In the aforementioned study by von dem Knesebeck (2005), moderator effects were tested in addition to mediator effects. Moderator effects turned out inconsistent, as they depended on specific health indicators and network characteristics. The positive association between network characteristics (frequency of contact with friends and family) and subjective health or functional health was weakest in the middle status group. The negative association between contact frequency with friends and family and depression was strongest in the high status group: people with infrequent contact and deficient social support had a higher risk of depression than people of low socioeconomic status. The Heinz Nixdorf Recall Study (Vonneilich et al., 2011) also showed few statistically significant interaction effects of socioeconomic status with social networks on subjective health and depression, which further varied between men and women.

The reported findings only partially support the assumption that socioeconomic status moderates the empirically established association between structural network characteristics and health in old age.

6 Summary and Critical Reflection

At an advanced age, there are associations between socioeconomic status and the risk of mortality, dementia, and depression. However, the presented findings do not provide a clear answer to the question of how health inequalities play out over the course of life. The reviewed studies confirm both the continuity and the divergence thesis. For example, the studies on mortality risk tend to indicate that status-related differences in mortality risk continue over the life span (continuity hypothesis). As early as 1990, House et al. (1990) suggested that research on health in old age requires a stratified view against the background of individual socioeconomic status. In addition, health risks in old age also increase for persons with a lower socioeconomic status due to their higher risk of developing dementia and depression (divergence thesis). This ambiguity of findings with regard to health inequalities over the

course of life has often been noted in the research literature. This ambiguity is also due to the different operationalizations of socioeconomic indicators (education, occupational status, and income) and the different health dimensions. Furthermore, conventional indicators may not be suitable for adequately capturing differences in the accumulated socioeconomic conditions in old age (education and occupation date back a long time, are only comparable to a limited extent for men and women, ownership structures provide more information on the accumulation of resources) (Clemens, 2008; Kohli et al., 2000; Leopold & Engelhardt, 2011; von dem Knesebeck & Schäfer, 2009). For parents in old age, for example, it is conceivable that health inequalities are further influenced by unequal socioeconomic resources of their adult children (such as the extent of support in care services, knowledge about diagnosis and treatment options) (Rueda & Artazcoz, 2009; Saraceno, 2010). Moreover, as shown by the example on depression, parental socioeconomic status in childhood can play a role for health in old age and therefore may not be underestimated (Brandt et al., 2012; Pakpahan et al., 2017). Future research may take a closer look not only at the socioeconomic position of the older person but also that of their parents and adult children.

Empirical findings on the interplay between structural network characteristics and the risk of mortality, dementia, and depression support the activity theory: The maintenance of social interactions even in retirement seems to be an important protective factor for health. Network size is less important than the extent of social embeddedness. According to the socio-emotional selectivity theory, strong embeddedness can be experienced even when the network size decreases. An explanation for this could lie in the stability of the contacts in the network, who, according to the theory of the social convoy, belong to the inner core. For a concluding statement, however, more research is needed on the number and role diversity of social relationships (Ellwardt et al., 2015a) and other structural network characteristics, such as network density and bridge relationships. In addition, the cultural context should be taken into account when analyzing the links between social networks and health (Li & Zhang, 2015; Schwarzbach et al., 2014). Importantly, both functional and structural characteristics can make independent contributions explaining the variance of health parameters among older people (Antonucci et al., 1999). Furthermore, it became apparent that associations with health were particularly strong when complex measures were analyzed (e.g., both lifestyle and network integration and experience of the network relationship). Research designs focusing either solely on qualitative or quantitative network characteristics run the risk of systematically underestimating real effect sizes of social embeddedness. Thus, several indicators should be tested in parallel (Ellwardt et al., 2015b) combined, for example, in the form of network types (Ellwardt et al., 2016). For the construction of a typology, people are classified based on different characteristics of their networks, for example, in groups with large high-functional versus small low-functional networks. Next, these groups of people are compared in terms of their health. Another critical point is that often proxies are used to operationalize social networks, for example, contact frequency and household composition. Research has shown the added value of applying original network analyses for

explaining health in old age (Li & Zhang, 2015; Schwarzbach et al., 2014; Youm et al., 2014). So far, longitudinal analyses have focused primarily on testing network effects on health. Research gaps exist with regard to the opposite direction, that is the influence of health deterioration on social networks.

The overview at hand on the associations between the three areas of “socioeconomic status,” “health,” and “social network” focused primarily on depression and functional and subjective health. However, risk of mortality and dementia is still largely unexplored. The mechanisms of mediation of socioeconomic status, health, and social network in old age cannot yet be sufficiently explained based on previous research. According to the current state of knowledge, moderating effects of network characteristics on health inequalities in old age seem most likely.

Previous research has produced at least three conclusive points for a future research agenda. Firstly, there is a focus on people living in their own homes. It remains largely unclear to what extent existing findings are generalizable to people living in care institutions. This research gap needs closing. Secondly, analytical designs incorporating complex network measures are more suitable for investigating the associations between “socioeconomic status,” “health,” and “social network” than designs consisting of only either quantitative or qualitative measures. Thirdly, in gerontological research, mostly network characteristics are assessed indirectly through proxies. Established quantitative and qualitative methods of network analysis have so far played a subordinate role in research on older people. The potential of “true” network analysis could be exploited more in future studies.

Recommended Readings

Vonneilich, N., Jöckel, K.-H., Erbel, R., Klein, J., Dragano, N., Siegrist, J., & von Dem Knesebeck, O. (2012). The mediating effect of social relationships on the association between socioeconomic status and subjective health—results from the Heinz Nixdorf Recall cohort study. *BMC Public Health*, *12*(1), 285. *This study is one of the first to examine the effect of SES on the association between social relationships and health (average age of the sample: 60 years). It found only a few statistically significant interaction effects of socioeconomic status and social network on subjective health or depression, which also vary between men and women.*

Ellwardt, L., van Tilburg, T., Aartsen, M., Wittek, R., & Steverink, N. (2015). Personal networks and mortality risk in older adults: a twenty-year longitudinal study. *PloS one*, *10*(3), e0116731. *Data from the Longitudinal Aging Study Amsterdam (LASA) are used to report relationships between mortality and network features that reflect both structural and functional aspects.*

Goldman, A. W., & Cornwell, B. (2015). Social network bridging potential and the use of complementary and alternative medicine in later life. *Social Science & Medicine* *140*, 69–80. *The study uses data from the first wave of the National Social Life, Health, and Aging Project (NSHAP) to test the*

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hypothesis that people who connect otherwise unconnected groups, that is, who have a bridging function and use complementary medicine more often than other network members.

Carr, D. (2019). *Golden years?: Social inequality in later life*. Russell Sage Foundation.

Roth, A. R. (2020). Social networks and health in later life: A state of the literature. *Sociology of Health & Illness*, 42(7), 1642–1656.

Data Sets/Overview

- **“SHARE” (The Survey of Health, Ageing and Retirement in Europe)**

The study started in 2004 as a representative survey of the population aged 50 and over. Eleven European countries (Belgium, Denmark, Germany, France, Greece, Italy, the Netherlands, Austria, Switzerland, Sweden, Spain) participated in the baseline survey. Cross-sectional and longitudinal data are available from seven survey waves and participants from 27 European countries as well as Israel. In the fourth and sixth wave, the social network was surveyed via name generators.

- **“Heinz Nixdorf Recall Study”**

This is a population-based cohort study. Participants live in the Metropole Ruhr and were 45–75 years old at baseline in 2000–2003. A second wave took place in 2006–2008 and a third wave in 2010–2013. Cardiovascular diseases in particular are investigated. Network instruments include the “Social Integration Index” (SII) and the German adaptation of the “New Haven Established Population for Epidemiologic Studies of the Elderly (PEPSE) Questionnaire.”

- **“LASA” (Longitudinal Aging Study Amsterdam)**

The study focuses on physical, emotional, and social aging processes using a Dutch sample. For the baseline study in 1992, the participants in the study were aged 55–85 years. Follow-up examinations are carried out every 3 years; in each wave, data on personal networks are collected.

- **“HRS” (The Health and Retirement Study)**

The initial sample of this American longitudinal study contained people born between 1931 and 1941. They were first examined in 1992. New examinations are carried out every 2 years. Indicators of the social network record its composition, number of close relationships, and frequency of contact.

(continued)

- **“NSHAP” (National Social Life, Health, and Aging Project)**

The baseline examination of this American study took place in 2005–2006; the sample participants were aged 57–85. A second wave was realized in 2010–2011 and a third wave in 2015–2016. Egocentric networks are surveyed using name generators.

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Nico Vonneilich 

Overview

- The differential exposure hypothesis assumes that the link between social status and health also exists, because lower status groups have fewer social contacts and less social support.
- The hypothesis of differential vulnerability assumes that it is precisely in lower social status groups that a lack of social relationships has a greater impact on health.
- The majority of study results to date can confirm the hypothesis of differential exposure (mediator effect of social relationships).
- The state of research on the hypothesis of differential vulnerability is rather inconsistent; there is little evidence of a moderating effect of social status on the relation between social relationships and health.

1 Introduction

This chapter aims to provide an overview of research on the links between social relationships, social status, and health. Social relations can be understood as an overarching concept that encompasses various aspects of social relations. Comprehensive indicators of social networks can hardly be identified in any study (see chapter “[Network Analysis and Health Inequalities: A Methodological Introduction](#)”). In studies on this topic, the indicators used range from quantitative aspects such as social

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Fig. 1 Explanatory contribution of social relations regarding the link between social relations and health ($c-c'$) (thesis of status-specific exposure). Source: Own illustration

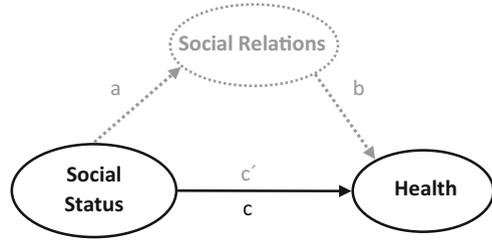
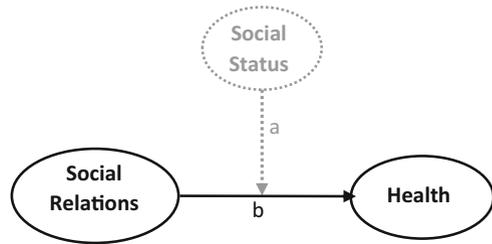


Fig. 2 Moderating effect of social status (**a**) on the associations between social relations and health (**b**) (thesis of status-specific vulnerability). Source: Own illustration



integration and the number of social contacts to qualitative aspects of social relations such as social support and social capital, measured on a small scale. In accordance with this diversity, social relations are used as an overarching category.

In the context of this chapter, the state of research is presented in relation to two central questions:

- *Mediator effect of social relationships*: Are there studies that have found a contribution of social relations to explain the links between social status and health?
- *Moderator effect of social status*: Is there evidence that social status moderates the relationship between social relationships and health, and does the relationship between social relationships and health vary in different status groups?

The first question aims to show that social status has an impact on health, precisely because different status groups have different social relationships (see Fig. 1). The so-called *differential exposure hypothesis* assumes that the relationship between social status and health can be explained by lower status groups having fewer social contacts and less social support. Therefore, health risks of low social status groups are more pronounced (Krause, 2001). Social relations could thus contribute to an explanation of health inequalities, since they act as a mediator between social status and health.

The second question assumes that the links between social relationships and health vary according to status groups (see Fig. 2). According to this assumption, lower status groups in particular have a higher health vulnerability, precisely due to insufficient social contacts and social support. This assumption is reflected in the *differential vulnerability hypothesis* (Krause, 2001). Hence, a stronger connection between social relations and health can be found especially in lower status groups, and social status moderates the connection accordingly.

2 State of Research

2.1 Mediator Effect of Social Relations

In the so-called path model by Berkman and Krishna (see Fig. 3), various aspects of social relationships can act as mediators for the relation between socioeconomic status and health. The model shows possible paths of socioeconomic factors on different aspects of social relationships and on health. The mediator function of social relationships, that is, the question of the extent to which social relationships can explain the links between social status and health, has already been explored in various studies.

Cohen and colleagues studied the links between social support, social status, and subjective health (Cohen et al., 1999). After showing that social support is positively associated with both higher social status and perceived health, the explanatory contribution of social support was explored. The explanatory contribution of social relationships was most pronounced in the lower status groups (Cohen et al., 1999).

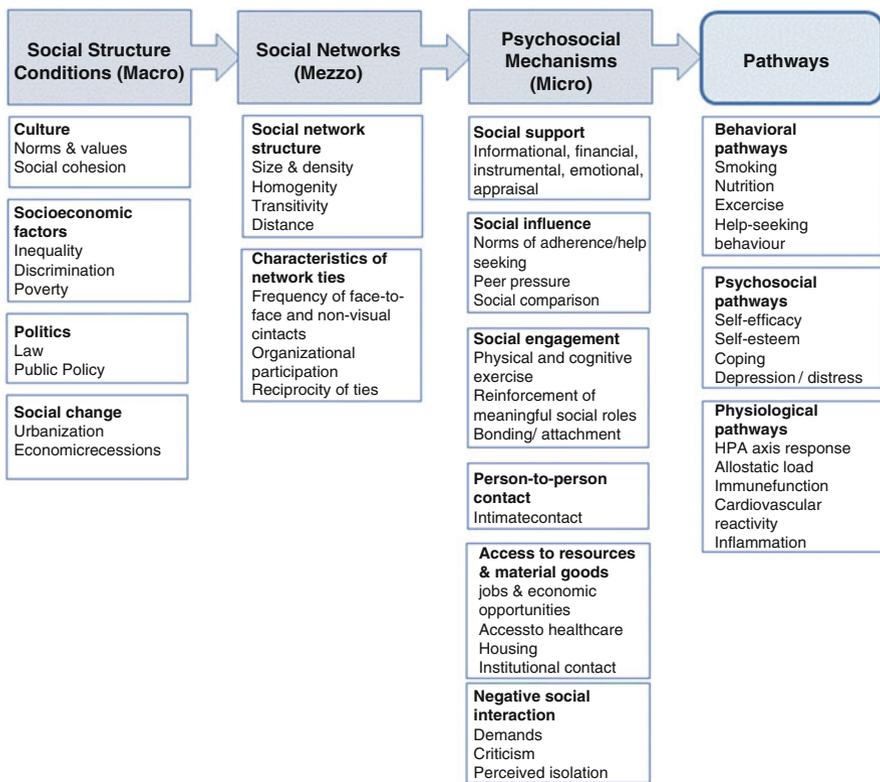


Fig. 3 The path model of the connection between social relations and health according to Berkman and Krishna. Source: Berkman and Krishna (2014)

Gorman and Sivaganesan (2007) found no evidence of a complete mediator effect of social relationships. However, their subgroup analyses showed that the links between individual status indicators and subjective health decreased after controlling for social relations. Particularly unemployed persons seemed to benefit from social integration in terms of their subjective health, since the negative effect on health could be significantly mitigated by social integration (Gorman & Sivaganesan, 2007).

In their analyses based on cross-sectional, representative data from Norway, Dahl and Malmberg-Heimonen (2010) found no mediator effect on social relations regarding the relationship between socioeconomic status and health. Social relationships were determined especially at the level of social capital, using both emotional and instrumental support, as well as the number of personal contacts, as indicators. However, none of the indicators used contributed to a significant reduction in the relation between social status and health. The health indicators used in the study were subjective health and information on chronic diseases (Dahl & Malmberg-Heimonen, 2010).

Knesebeck and Geyer (2007) also examined the extent to which social support may help explain the links between social status, measured by education, and subjective health. They limited their analysis to emotional support. Based on analyses of the *European Social Survey of 2003*, the authors found little evidence that emotional support can help explain health inequalities. The country-specific analysis only showed explanatory contributions of emotional support for few countries. There was no evidence that emotional support leads to different explanatory contributions of health inequalities between men and women.

Kroll and Lampert (2011) found an effect of social support on the association of unemployment and health impairments. They found that those unemployed who reported sufficient social support were more likely to have less health impairments than those who had little social support. These results were based on a cross-sectional, representative telephone survey in Germany.

Huurre et al. (2007) found no evidence in their study that social support can help explain the link between socioeconomic status and depression in young adults, based on data from a Finnish cohort study.

Aida et al. (2011) provided a further indication that social relationships can possibly buffer the relation between social status and health, especially for older people. Using their analysis based on cross-sectional data from an ongoing Japanese cohort study, the authors were able to show that for the population under study, social capital at the community level, such as the number of club memberships and general trust in the community, contributed to a reduction in the correlation between social status and subjective health. However, no contributions were found to explain indicators of social capital at the individual level.

In analyses regarding the links between social inequality, social cohesion, and mental health, Fone et al. (2007) showed that not only socioeconomic status influenced the probability of weaker mental health, but that the interaction between low status and weak social cohesion within the neighborhood significantly increased the probability of poor mental health.

Overall, there are different indications of the explanatory contribution of social relationships on health inequalities. Depending on the health indicators used or aspects of social relationships, the explanatory contributions vary significantly. In addition, the selection of the target population plays an important role as research on social relations in old age shows. In a review regarding the extent to which material, psychosocial, or behavioral aspects make a greater contribution to explaining health inequalities, Moor et al. (2017), after analyzing the literature, conclude that material aspects in particular contribute to the explanation. However, the authors stress that the effects of material aspects also have an indirect effect on health inequalities via psychosocial and behavioral aspects.

2.2 Moderator Effect of Socioeconomic Status

Evidence that socioeconomic status moderates the links between social relationships and health is found in a French cross-sectional study (Heritage et al., 2008). The authors were able to show that the associations between weak social relationships and poor subjective health are strongest particularly in lower status groups, while the correlations were less clear in upper status groups.

Gorman and Sivaganesan (2007) found clear differences in the relation between hypertension and social integration—measured by the number of contacts with family and friends in the last 2 weeks before the survey—between different status groups. It was found that people without a high school degree also showed higher risks of hypertension with increasing social integration. However, this picture changed completely when the results of the study were monitored for higher education groups: Here the probability of developing high blood pressure decreased with increasing social integration (Gorman & Sivaganesan, 2007). It was found that, especially in higher status groups, the probability of good subjective health rose with increasing social contacts. However, these analyses were based on cross-sectional analyses.

An analysis based on data from the French GAZEL cohort study provided evidence that socioeconomic status moderates the relationship between social relations and health (Melchior et al., 2003). However, different results were found for women and men. In particular, men in higher occupational positions showed the strongest associations between social relations and subjective health: a low level of social support led to a significantly higher risk of poor subjective health than in the other occupational groups that were studied. For women, very similar associations were found across different occupational groups, so a moderating effect of social status cannot be seen (Melchior et al., 2003).

A Finnish cohort study on young people and adolescents found evidence that the strength of the relation between social relationships and health varied according to social status (Huurre et al., 2007). Depression was used as a health outcome. Social relationships were measured by information on social support and the size of the personal network. Results showed that, especially in families where the principal

earner worked in manual labor, the relationship between depression and indicators of social relations was stronger than in families where the principal earner was not employed in manual labor (Huurre et al., 2007).

3 Discussion and Significance of Social Networks

3.1 Mediator

The explanatory share of social integration refers to the social environment and social space in which interactions take place. The social space also refers to the different structures in which these actions happen and also the contexts in which they take place. Actions that are intended to change the interaction of individuals in a particular area or community in a positive way also represent a change of context. The importance of contexts for health and health inequalities shifts the focus of attention away from individual factors to social structure (Frohlich et al., 2001). One contribution of social integration to mitigating negative health effects of low social status refers to circumstances that are not necessarily linked to individuals, but rather to the social environment. According to Frohlich et al. (2001): “Consequently, material/structural factors in health inequalities research are frequently studied as proxies for social structure and each variable is not understood in terms of its relation to other elements in the system, nor in terms of how it is manifested in and reinforced by social practices” (Frohlich et al., 2001, p. 781). The reference to social practices suggests that the importance of social relations in explaining health inequalities points to more than the mere existence of individual risk factors. Structures within societies, which certainly include social environment, can also influence individual behavior. The context of individual actions results from the interaction of restrictions and possibilities; thus, individual actions can be explained on a structural level. However, the context is also changed and reinterpreted by individual actions. In the authors’ view, these mechanisms of recursiveness between context and individual demonstrate that individualizing concepts such as “lifestyles” cannot fully contribute to an explanation of collective social practices (Frohlich et al., 2001). The above mentioned findings suggest that social relationships, especially social integration, can contribute to an explanation of the links between social status and subjective health, pointing towards the role of mediating factors (“agency”). These are possibly associated with the development and sustainability of certain social practices within limited social spaces.

Approaches to interventions on social relationships have also been discussed in order to reduce health inequalities. These range from adaptating the living environment (Eriksson & Emmelin, 2013) to influencing health-related behavior and thus increasing social control (Conklin et al., 2014). When health can benefit from the effect of social relations, then the quality of the immediate living environments in which social interactions take place plays an important role. Kawachi and Berkman have shown in their review that social integration and a high degree of social

interaction are more likely to contribute to health-promoting behavior and the development of health-promoting norms. It can also be assumed that within well-organized neighborhoods and communities, access to health care and also to health-related knowledge is easier (Kawachi & Berkman, 2001). As previously mentioned, qualitative characteristics of housing and living conditions, which can promote or hinder integration and interaction, are closely linked to socioeconomic resources, particularly income. These structural differences in living conditions also affect the utilization of protective factors in housing conditions. Not everyone has the opportunity to benefit from favorable housing conditions. Unfavorable housing conditions within socioeconomically disadvantaged neighborhoods and communities have a negative impact on health, as some studies have already shown (Dragano et al., 2007, 2008; Mujahid et al., 2008).

Especially against the background of more complex measurements of social relations and the resulting different explanatory contributions of indicators of the social network or the qualitative aspects of social relations, different possibilities of interventions arise. While a higher explanatory contribution of social support points clearly to more resources within social relationships, a stronger mediating effect of social network indicators points more strongly to the possible improvement of social interactions in the populations studied. In their cross-sectional study, Salonna et al. (2012) showed that not all aspects of social relationships per se can contribute to an explanation of health inequalities. They suggest that future research on this topic should take a more complex approach on social relationships. In addition, further research should examine other facets of social relations in addition to the quantitative and qualitative aspects of social relations—permanent conflicts, the range of social networks, and also the increasing importance of virtual social networks.

Social relationships cannot be considered positive per se (see chapter “[Negative Ties and Inequalities in Health](#)”). Not every form of social support or social contact can help mitigate the negative health effects of low social status. For the results presented here, this means that a future detailed consideration of negative aspects, such as social isolation or conflicts within social relationships, could have an influence on the identified explanatory contribution of social relations on health inequalities. It is possible that particularly individuals and groups with lower status may have less access to resources within communities due to exclusion processes and thus may ultimately be more vulnerable to health inequalities (Portes, 1998; Abel & Frohlich, 2012; Uphoff et al., 2013). Social processes that promote the exclusion of lower status groups and thus impede their access to social capital within communities often have corresponding health consequences (Subramanian et al., 2002; Uphoff et al., 2013). From this perspective, it therefore seems important that future research projects include negative aspects of social relations in their analyses. Even the feeling of being overwhelmed by social networks can have negative health consequences. People who are particularly active in social relationships might feel overwhelmed, as there may not be enough time to fulfill corresponding social roles within these networks to a satisfactory extent (Macinko & Starfield, 2001; Mansyur et al., 2008; Gorman & Sivaganesan, 2007).

3.2 Moderator

Overall, the results of studies to date regarding a moderating effect of social status on the links between social relations and health are largely inconsistent. The studies found on this topic varied considerably with regard to status and relationship indicators used, and the results also varied depending on the health indicators used. In a review Uphoff et al. (2013) present an overview of studies that examine the moderating effect of social status on the relation between social capital and health. Some of the studies included in the review conclude that especially people from lower status groups benefit from the effects of social capital in terms of health. In studies that confirm these findings, there are significantly stronger associations between social capital and health in lower status groups compared to upper status groups. However, the results of some of the studies cannot be generalized due to the chosen populations and the selected health outcomes.

On the basis of his comments on the various forms of capital, Bourdieu also discussed the mutual conditionality of the three main forms of capital (Bourdieu, 1986). Accordingly, social relations and the social capital they contain can only be properly used and applied when economic and cultural capital is also available, which in turn enables access to social contacts and their continuation. Conversely, this would mean that people from lower status groups have less social capital and therefore use it less effectively for their health; that is, they are not able to benefit from the possible positive effects (Uphoff et al., 2013). This does not necessarily have to be in contrast to previous research findings: People in lower status groups may particularly benefit from *bonding social capital*, but they lack *bridging social capital*. Bonding social capital refers to ties between similar network members, mostly within a given social network. It reflects the social cohesion of social groups. Bridging social capital “bridges” across different social groups and does not necessarily connect similar others. It can be linked to solidarity or social justice within a society as a whole. A further assumption regarding the connection between social relations and health is that within social communities with sufficient social capital there are also people who do not benefit from it. If social capital is available especially to those with higher social status, it can accelerate exclusion processes and lead to permanent exclusion of others. This holds particularly true for contextual social capital, which is social capital that is available within social communities but is not equally accessible to everyone within the community. In this respect, such a process can also contribute to an increase in health inequalities, as permanent exclusion can also have negative effects on health (Uphoff et al., 2013).

Moreover, it was shown that a moderating effect of social status does not occur equally for all aspects of social relations. A differentiation should be made between quantitative and qualitative aspects, since these can be associated with health in different ways, even against the background of social status.

4 Summary and Conclusion

There is a wide variety of studies on the different links between social status, social relations, and health. However, this diversity, especially due to the indicators used, does not allow for a comparability of results. This is especially true for the different indicators of social relations, but also for health indicators and, with certain limitations, status indicators. For both research questions, the study situation is rather heterogeneous; overall, there is less evidence for a moderating effect of social status than for an explanatory contribution of social relationships to health inequalities. There is stronger evidence for the latter on the basis of longitudinal analyses. However, in most cases the explanatory contribution remains rather small and, compared to other explanatory approaches, tends to lag behind. There is still a need for further research on the question of how the individual explanatory approaches to health inequalities are mutually dependent and how they are related to one another (see Moor et al., 2017).

A more complex and multidimensional assessment of social networks, which covers different aspects of social relations, could lead to a better comparability of results across different network and relational indicators. In addition, by looking at smaller social networks, statements can be made about the social environment that go beyond the previous standard of ego-based surveys. What is the relation between network members, how exactly are resources distributed within the networks, and what influence do such aspects have on health? These questions could be answered more concretely when referring to the socioeconomic status of both the respondents and the network members. It remains to be seen whether these questions will actually lead to better answers to the two central research questions in this area. With increasing technical possibilities, improved survey instruments, and more complex analysis methods, it would be desirable to reach a more detailed perspective on the links between social status, social networks, and health in the future.

Reading Recommendations

- Berkman, L. F., & Krishna, A. (2014). Social network epidemiology. In L. F. Berkman & I. Kawachi (Eds.), *Social Epidemiology* (pp. 234–289). Oxford University Press. *Detailed and systematic overview of the relationship between social networks and health.*
- Uphoff, E. P., Pickett, K. E., Cabieses, B., Small, N., & Wright, J. (2013). A systematic review of the relationships between social capital and socioeconomic inequalities in health: a contribution to understanding the psychosocial pathway of health inequalities. *International Journal for Equity in Health*, 12(54). *One of the very few systematic reviews in the field that considers aspects of social relationships, social status, and health.*
- Moor, I., Spallek, R., & Richter, M. (2017) Explaining socioeconomic inequalities in self-rated health: a systematic review of the relative

(continued)

contribution of material, psychosocial and behavioural factors. *Journal of Epidemiology & Community Health*, 71, 565–575. A recent review of how health inequalities can be explained and which aspects in particular contribute to an explanation.

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Unemployment, Social Networks, and Health Inequalities



Gerhard Krug , Stefan Brandt, Markus Gamper , André Knabe ,
and Andreas Klärner 

Overview

- Unemployment leads to impairment of physical and mental health.
- There are two important theses on the role of social networks in this context:
 - Thesis 1: Unemployment changes social networks so that they no longer fulfill their positive function for health (mediator thesis).
 - Thesis 2: Unemployment leaves social networks unchanged and persons with resource-rich networks suffer less from health losses due to unemployment (moderator thesis).

(continued)

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- There is little empirical evidence to support either of these theses.
- The few quantitative analyses measure networks only indirectly and are strongly limited in their informative value due to the lack of longitudinal data.
- Qualitative studies would benefit from a more systematic approach to network influences and thus make them accessible for quantitative analyses.

1 Introduction

The loss of employment is an event that interferes with the lives of everyone affected, causes stress (Pearlin, 1989), and can have a negative impact on their health. Meta-analyses show that unemployed people have a worse state of health and a mortality risk that is at least 1.6 times higher than those who are employed (Herbig et al., 2013; Norström et al., 2014; Roelfs et al., 2011). Unemployment is associated with a lower mental and physical health status and, in some cases, with riskier health behavior (particularly tobacco consumption) (Freyer-Adam et al., 2011; Khlal et al., 2004; Paul & Moser, 2009; McKee-Ryan et al., 2005).

Recent survey (Kroll et al., 2016) and health insurance data (Knieps & Pfaff, 2016) show that psychological problems (depression, anxiety disorders, etc.) are more frequent among the unemployed. They assess their state of health as significantly worse than employed persons, as they smoke more often and exercise less often. While some studies tend to point to higher alcohol consumption among the unemployed (Henkel, 2011), no significant differences can be found in this respect in other investigations: Unemployed women in Germany even consume alcohol less frequently to an extent that is harmful to their health (see also Eggs et al., 2014).

Unemployment also has a negative impact on the daily consumption of healthy food such as fresh fruit and vegetables and a hot meal. In international research, this is referred to as “food insecurity.” In the USA, for example, a study on the effects of the 2007–2009 recession showed that unemployment and food insecurity are strongly correlated (Huang et al., 2016). Evaluations made by the German Socio-Economic Panel (SOEP) show that the share of the household budget spent on food (19.2%) is significantly higher for unemployed people, but the absolute sum of €205 is considerably lower compared to working households (13.7% and 362€) (Pfeiffer et al., 2016).

A number of theoretical analyses assume that social networks play an important role in how unemployment affects health. Some literature assumes that unemployment has an impact on the network and that this change in the network, in turn, has an impact on health (mediation effect, see e.g., Jahoda, 1981; Warr, 1987). Another argument assumes that networks reduce the negative consequences of the stress caused by unemployment on health (moderator effect, see e.g., Cassel, 1976; Cobb, 1976; Atkinson et al., 1986).

This article provides an overview of empirical analyses on the topic of networks and unemployment.

Section 2 presents the state of research on unemployment and health. Section 3 deals with the concrete significance of social networks in relation to unemployment and health. Section 3.1 summarizes empirical research findings on the role of networks as mediators, and Sect. 3.2 summarizes research on the role of moderators. Section 4 concludes with a summary and evaluation of the state of research.

2 Unemployment and Health

Usually, the thesis that unemployment causes health problems (causation thesis) is contrasted with the thesis that those with poorer health are more likely to become unemployed. However, most of the literature follows the causation thesis and assumes that selection plays only a minor role (Kroll et al., 2016; Brand, 2015; Wanberg, 2012). This assumption is also supported by recent empirical evidence (Krug & Eberl, 2018).

In their meta-analysis, Paul and Moser (2009) report that most research on unemployment and health deals with the effects on mental or general health. Physical health plays a rather subordinate role here. This is still true even if one limits oneself to analyses with an explicitly causal-analytical design.

Cygan-Rehm et al. (2017) report negative effects on mental health among respondents in the U.S., Great Britain, Australia, and Germany. In addition, the results of Mandemakers and Monden (2013) also show that the negative effect on mental health depends on the level of education. At the same time, higher educated unemployed people suffer less from health problems because their prospects of re-employment are better. Although Mandemakers and Monden (2013) also report a negative health trend before unemployment, they do not interpret this as evidence of health selection, but rather as negative consequences of anticipating unemployment. Young (2012) also points to the negative effects on mental health in the U.S. These can be explained neither by the loss of income due to unemployment nor by the (non-) availability of health insurance. In addition, health status, as measured by a depression scale, does not return to the level before unemployment even after the return to work.

For Italy, Minelli et al. (2014) cannot find any causal unemployment effects referring to self-assessed health. With regard to Finland, Böckerman and Ilmakunnas (2009) also find no causal effects of unemployment on self-assessed health, but they show that people who become unemployed at some point already had a poor health status. They interpret this as evidence for the thesis of direct selection. In contrast, Tøge and Blekesaune (2015) report a strong negative causal effect of unemployment on self-assessed health in 28 EU countries, which increases with the duration of unemployment. As they find no negative health trends before entering unemployment, they dismiss the selection hypothesis. According to Pearlman (2015), unemployment as a result of firm closures has a negative impact on self-rated health, while

unemployment for other reasons does not affect health. Gebel and Voßemer (2014) find statistically negative effects on life satisfaction, but no effects on the health satisfaction of respondents in Germany. They interpret their results as evidence of the negative causal effects on mental rather than physical health. In contrast, Schmitz (2011) initially finds negative health effects of unemployment on health satisfaction, mental health, and hospital stays, but not for unemployed people who have lost their jobs due to a firm's closure. Since this particular group of unemployed people does not show any health effects, Schmitz sees a pure selection of employees who have fallen ill into unemployment but not the negative health effects of unemployment itself. Salm (2009) comes to similar conclusions for the USA. He finds no effects on the physical or mental health of workers that became unemployed due to plant closures and concludes that there are no causal effects of unemployment.

Based on Norwegian data, Black et al. (2012) identify unemployment effects on physical health, in this case, coronary diseases. Korpi (2001) analyses Swedish data and, using causal analysis, reports no effects of current unemployment on health, but notes negative effects related to the duration of past unemployment. In an additional analysis, which, in contrast, does not allow for the control of unobserved third variables, Korpi (2001) identifies a correlation between poor health and the increased risk of becoming unemployed. In doing so, he confirms both the causation and selection hypotheses.

Other work deals with health behavior, which can ultimately have an impact on physical health. Marcus (2014) finds significant positive effects of unemployment on cigarette consumption and body mass index in Germany. However, this is contradicted by the analyses of Schunck and Rogge (2012), who also examine the effects of unemployment on smoking behavior in Germany, but find no significant effect of the duration of unemployment.

Qualitative research focuses primarily on how those affected cope with being unemployed. Based on an identity-theoretical heuristic, Rogge (2013, p. 64) describes the effects of unemployment as an interplay of contextual and individual processes. He identifies five biographical modes of identity: "conversion of the self," "liberation of the self," "struggle for the self," "decay of the self," and "transformation of the self," whereby the psychological burden of unemployment varies with the respective mode. Decisive for the mode in which people experience unemployment are, not least reference persons in the social network of unemployed people. Rogge (2013, p. 272) describes a normative division of personal relationship networks by separating "into persons who (supposedly) stigmatize unemployment on the one hand, and persons who (supposedly) destigmatize it, normalize it, or represent alternative and solidary interpretations." This split not only results in the selection of relationship partners, but is also "highly relevant for the mental health of the unemployed" (Rogge, 2013, p. 272).

3 The Role of Networks in the Link Between Unemployment and Health

Most of the literature assumes that unemployment has a negative impact on health. In this context, networks can have two different roles, which are often not clearly separated in the literature. On the one hand, networks can represent one of the causal paths through which unemployment has a negative impact on health. Jahoda (1981), for example, cites a number of functions of gainful employment, and the loss of each leads to a loss of health. She identifies income as the manifest function of work and a number of latent functions: structuring the daily routine, participation in collective goals, activity, status, and identity, and social contacts. In this case, networks would help precipitate the health effects of unemployment. It is also said that networks mediate the relationship between unemployment and poor health and thus *act as a mediator* (see Fig. 1). If the networks are weakened, they can no longer fulfill their health-promoting function and this leads to poorer health among the unemployed.

Secondly, networks can help mitigate the negative effects of unemployment. This thesis of mitigating negative effects assumes, in contrast to the production thesis, that networks remain basically unchanged. It states that unemployed people with a resource-strong network are better able to compensate for negative effects such as loss of income or meaning. The network then provides social, material, emotional, or instrumental support to cope with unemployment. The thesis of mitigation is also often referred to as the *buffer or facilitator thesis* (see Fig. 1) (see also chapter “[Social Status, Social Relations, and Health](#)”).

In the following two sections, the literature on the respective theses is presented. It becomes clear that empirical research on health inequalities has so far rarely dealt with the testing of either thesis, even though they are prominently featured in the literature on unemployment and health.

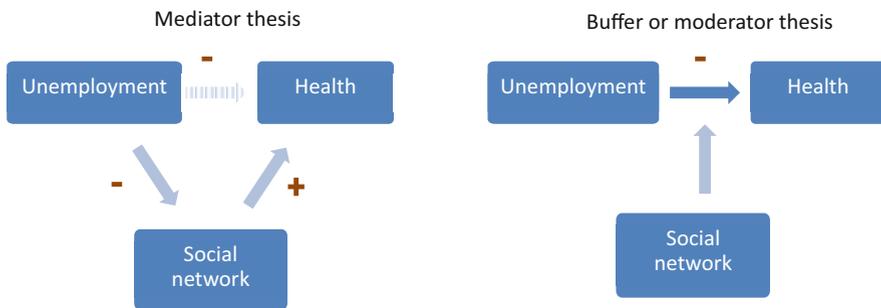


Fig. 1 Unemployment, networks, and health: Mediator and moderator theses. Source: The authors

3.1 Mediator Thesis: Network Change as a Cause of Health Effects

The mediator thesis assumes a causal chain in which in the first step unemployment has a negative impact on the existence and composition of the network. In a second step, the altered networks then have a negative effect on health. The mediator thesis is often referred to when explaining the negative health effects of unemployment by describing social contacts as one of the latent functions of work that are impaired by unemployment. Yet, very few studies can be found that subject the thesis to direct empirical testing.

Paul et al. (2009) conclude that the negative effect of unemployment on mental health can be fully explained by deprivation in terms of the latent functions of employment. However, the authors do not provide any analysis of the relevance of deprivation referring to the role of social relations. Janlert and Hammarström (2009) examine a number of theoretical concepts on the relationship between unemployment and health, including social support and network scope. They do not find significant effects for either of them. Similarly, Creed and Macintyre (2001) find no correlation of social contacts with mental health among the unemployed, but do find significant correlations of mental health with financial burdens (manifest function) and the latent functions of collective goals, time structure, and status. In a study by Krug and Eberl (2018), panel data analyses were conducted taking into account unobserved heterogeneity and potentially reversed causal directions. Neither the number of close friends (strong ties) nor membership in at least one association (weak ties) gave any indication of mediation effects, nor did household income. Instead, some of the negative health effects were mediated via the lower subjective social status of the unemployed. In addition, Krug and Prechsl (2020) present results for conflict within the household, general as well as job search specific social support, all of which did not explain the adverse effects of unemployment.

Only a few papers deal empirically with the complete causal chain between unemployment, networks, and health, which is assumed in the mediator thesis. However, many papers examine at least part of this process. Besides the relationship between networks and health, the influence of unemployment on social networks also plays a role. Thus, a number of analyses can be found in the literature that focus on the changes in the size and structure of networks of unemployed people. Klärner and Knabe (2016), for example, show that the transition to unemployment is associated with the loss of the opportunity structure of the job to establish and maintain social relationships. Diewald (2007) states that the effect of unemployment on the number of friends can vary depending on the length of unemployment. Short-term unemployed people experience a slight increase, whereas long-term unemployed experience a decrease in the number of friends. Atkinson et al. (1986) analyze the social relationship networks of about 80 male labor market participants. They report no influence of unemployment on the size of the network, but show a change in the composition of the network members that is not further described. Russell (1999) shows that the networks of unemployed people largely consist of others who

are also unemployed. This has a negative impact on the availability of social support and job search assistance. Lindsay (2009), based on a standardized survey of unemployed people in Glasgow, shows that long-term unemployed people are less likely than other unemployed people to turn to former work colleagues when looking for a job, but are just as likely to look for work through close family and friends. According to Jackson (1988), an analysis of male unemployed people shows that, as unemployment progresses, the non-family network shrinks, thereby increasing the proportion of family ties in the network. In an analysis based on only 60 teachers, but comprehensive in terms of networks, Röhrle and Hellmann (1989) also report slight differences in the size of networks among teachers with shorter, longer, or no unemployment at the time of the survey.

Another strand of the literature examines the effects of unemployment on the level of social support and on the frequency of contact with network members. According to Atkinson et al. (1986), unemployment reduces both family support and the frequency of contact with acquaintances and friends. An additional analysis, where the authors stratified those persons surveyed according to occupational status (blue-collar worker vs. white-collar worker), shows that the contact frequency only decreases among blue-collar workers. According to the authors, the fact that blue-collar workers are more affected by financial restrictions due to unemployment than white-collar workers cannot fully explain this finding. Gallie et al. (2001) also use data from several countries to show that unemployed people on the whole more often meet friends and acquaintances but are less likely to receive special support than employed people. Röhrle and Hellmann (1989), in their aforementioned analysis, report no effects of unemployment on the frequency or intensity of contact among teachers. In contrast, unemployed teachers were more satisfied with their network and received more social support than their employed colleagues.

Qualitative analyses document the dissolution or disappearance of relationships with colleagues or friends from the world of employment and the reduction and homogenization of networks to the closest (usually family) groups (Cattell, 2001; Stead et al., 2001). The social stigmatization and devaluation of the unemployed are cited as the cause for these processes as a consequence of unemployment (Knabe et al., 2018; Hirsland & Ramos Lobato, 2014; Stead et al., 2001).

In particular, lack of involvement in gainful employment leads to social dependence, social pressure, and negative well-being due to a lack of moral support and social opportunities to build self-confidence (Cattell, 2001).

However, networks are not only the cause of problems, but can also help to overcome the negative and health-damaging psychological consequences of unemployment. The negative consequences of unemployment on social networks can be countered by the actors themselves using network-based strategies to expand their scope for action by shifting social activities to social circles outside the labor market—in neighborhoods or political groups (cf. Marquardsen, 2012). The availability of opportunity structures as well as the social and institutional recognition for these strategies are unequally distributed, referring to spatial and social dimensions (Knabe et al., 2018; Klärner & Knabe, 2019).

3.2 *Moderator Thesis: Networks as Protection Against Negative Health Effects of Unemployment*

The thesis of the buffer function assumes that social support, which is embedded in an individual's social network, reduces the negative material and emotional consequences of critical life events such as unemployment and thus strengthens the resistance to cope with unemployment (Cassel, 1976; Cobb, 1976; summarized in Sattler & Diewald, 2010).

As in the case of the mediator effects of social networks, there are only a few quantitative studies that explicitly address the moderator effects of social networks in the case of unemployment.

Atkinson et al. (1986) report that the negative impact of unemployment on mental health is mitigated by family support. They do not provide results for network size and frequency of contact. However, they emphasize the greater relevance of the analysis of extra-familial networks, since in the area of the nuclear family the simultaneous impact of unemployment renders the question of the support function irrelevant. Gore (1978) examines how the health development of 100 men from two company closures relates to social support. Those who claimed to have access to social support were less likely to show symptoms of physical illness than other unemployed people. Axelsson and Ejlertsson (2002) compare mental health among unemployed and employed young adults in a cross-sectional study. Unemployment is negatively related to health, although this relationship is mitigated by social support. Schwarzer et al. (1994) examine more than 200 migrants moving from East to West Germany. They show that those who had access to social support had fewer physical complaints. However, they also point to the negative impact of illness on the availability of social support. The studies by Milner et al. (2016) and Krug and Prechsl (2020) are the only ones known to us that investigate the moderator effect on the basis of a population sample and with the aid of causal-analytical methods. The focus is on the impact of social support on mental health. Milner et al. (2016) use the panel study Household, Income and Labor Dynamics in Australia (HILDA) to confirm the moderator effect in fixed-effects analyses. Social support is measured using a cumulative score of 10 items, which is then coarsened for further analysis into an ordered categorical variable with the characteristics low, medium, and high social support. They show that the negative effect of unemployment on mental health is mitigated by high social support, but cannot be avoided completely. In contrast, Krug and Prechsl (2020) use data from the German Panel "Labour Market and Social Security." They find no buffering effects, after applying fixed-effects regressions, for two indices of social support (general and job search specific support), the number of weak ties, the number of strong ties, and conflict in the household.

The homogenization of social relationships not only has negative effects on health. Networks of predominantly unemployed people can provide a shelter from stigmatization and be an important source of emotional support. In this context, Stead et al. (2001) point out ambivalences of health-promoting and health-damaging

mechanisms in social networks. They analyze social inclusion in disadvantaged communities in Glasgow on the basis of eight group discussions with a total of 53 participants. The respondents' networks are characterized as relatively homogeneous in terms of social status, resource-poor, and sometimes with strong group-internal norms of health-damaging behavior (Stead et al., 2001, p. 137). Simultaneously they observe an "isolation from wider social norms" (Stead et al., 2001, p. 338). Unemployment is the rule rather than the exception in the networks of the participants. On the one hand, the relationship structures researched in this way offer identification possibilities and practical help and thus have a buffer function for negative (psychological) consequences of long-term unemployment. On the other hand, the respondents were encouraged to smoke rather than be supported in quitting.

With regard to available sources of social support, it is evident that the social network is one of the first and most important sources of contact for alleviating the negative consequences of unemployment, mostly through practical help in emergencies (e.g., payment of medical treatment costs by relatives) and emotional support (Edin & Lein, 1997; Hill & Kauff, 2001).

Heflin et al. (2011) examine the management of emergencies in low-income families on the basis of qualitative interviews with 50 women from the USA and find that the costs of medical emergencies in the absence of state aid and already exhausted individual strategies (less important bills not paid, accumulating debts, etc.) are managed in particular through recourse to social networks. In this way, emergencies can sometimes be mitigated by the financial resources from the network. However, aid remains uncertain, often ineffective, and not very sustainable. Networks are even less suitable for covering continuous needs. The result is health risks due to the lack of medication and treatments such as painkillers, contraceptives, and asthma medication or treatment by a family doctor or dentist.

Hill and Kauff (2001) describe very detailed mechanisms of recourse to social support based on an analysis of 16 unstructured qualitative individual interviews with employed and unemployed mothers living in very low-income (under \$500) households in urban and rural areas of in Iowa. Many of the women interviewed were very reluctant to borrow money. Informal work opportunities, such as baby-sitting for relatives, friends, and neighbors, are much more popular. Social support appears in the analysis as an important resource in the network. In particular, almost all mothers interviewed received small gifts of money, clothing, and toys for the children or food from their families. Social support from neighbors and friends appears to be less material than practical in everyday life, for example, in the form of childcare, transport, and donating children's clothes. Social support from the everyday network of relationships is more often taken up than institutional offers. But, this form of support is often only available to a limited extent because the network partners also often have limited resources. Furthermore, the extent of support received from the network is reduced by the fact that it is often not called upon in order to maintain a feeling of self-efficacy and not become too dependent on this rather unreliable form of support.

4 Summary and Evaluation of the State of Research

For those affected, unemployment is associated with lower mental and, to a lesser degree, physical health. There is a continuing debate as to whether this association reflects a causal impact of unemployment. In order to answer this question, research designs that are particularly suitable for causal analyses are necessary. In this respect, significant progress can be observed in the quantitative analyses of recent years, such as the more frequent use of longitudinal data and the application of statistical methods to control observable third-party variables. On the other hand, analyses of the causal mechanisms by which unemployment causes health impairments are also needed. One of these hypothetical mechanisms is based on the idea that social networks have a high relevance for health inequalities. To the extent that this mechanism can not only be theoretically explained but also empirically confirmed, research on this topic also serves as a contribution to the overarching discussion on the causal influence of unemployment as opposed to selection effects.

However, a comparatively small number of empirical research papers deal with the role of social networks in the relationship between unemployment and health. This is all the more surprising as the literature almost routinely refers to Jahoda's (1981) concept of the loss of latent functions of work, which includes social integration, to justify expected negative connections. Thus, the theoretical importance of social networks in the literature on unemployment and health is not reflected in a number of research papers dealing with their role as a mediator or moderator in this relationship.

In addition, the existing research on moderator and mediator effects of social networks lags behind not only in terms of quantity. First, in contrast to research on unemployment and health, state-of-the-art causal-analytical research designs hardly play a role. Thus, many analyses are based on very small and presumably selective samples, where no employed comparison group is used and no panel data regressions or related statistical methods of causal analysis are implemented. Of course, especially for older studies, methodological standards differed, and longitudinal data was not available. With the exception of Milner et al. (2016), Krug and Eberl (2018), and Krug and Prechsl (2020), there is still a lack of newer studies that make use of the current potential of statistical data analysis for the topic.

Second, in contrast to the research on social networks and health, it is striking that hardly any studies apply measures that reflect network structure and composition. This is probably due to the fact that the literature on moderator effects in particular argues less about the actual networks, their structures, and the resources they mediate. Instead, reference is made to the concepts of "social support" or "perceived social support." In addition, the effort required to survey ego-centered networks is very high and therefore hardly ever applied in surveys. Here, a special network survey procedure tailored to health aspects would have to be constructed and tested. There is great relevance for action here.

Qualitative studies show possible mechanisms of influence of social networks on the relationship between unemployment and health. A systematic categorization of

network influences on the relationship between unemployment and health is still lacking. The classification into mediator and moderator effects proposed here remains very fragmentary and theses-like in view of the few empirical studies.

Reading Recommendations

- Cattell, V. (2001). Poor people, poor places, and poor health: The mediating role of social networks and social capital. *Social Science and Medicine*, 52(10), 1501–1516. *A widely cited paper, based on qualitative studies, discussing the dynamics of poverty and exclusion, the living environment, and health and well-being, considering the role of social networks and social capital.*
- Jahoda, M. (1981). Work, employment, and unemployment. Values, theories, and approaches in social research. *American Psychologist*, 36(2), 184–191. *This paper provides a basic overview of social psychological theories on (gainful) work and unemployment and emphasizes in particular the latent functions of gainful employment.*
- Milner, A., Krnjacki, L., Butterworth, P., & LaMontagne, A. D. (2016). The role of social support in protecting mental health when employed and unemployed: A longitudinal fixed-effects analysis using 12 annual waves of the HILDA cohort. *Social Science and Medicine*, 153, 20–26. *One of the few studies on the moderator effect using panel data regressions, but the focus is on social support and not on social networks.*
- Krug, G. & Prechsl, S. (2020). The role of social integration in the adverse effect of unemployment on mental health—Testing the causal pathway and buffering hypotheses using panel data. *Social Science Research*, 86, Art. 102379. *This paper uses panel data for a comprehensive test of mediator and moderator effects of various social capital, social support and social networks measures.*

Data Sets/Overview

- Panel Labour Market and Social Security (PASS): An annual longitudinal survey of the Institute for Employment Research (IAB), since 2007, focusing on the social and economic situation of unemployed and employed persons. Regular surveys focus on social networks and health. <http://www.iab.de/en/befragungen/iab-haushaltspanel-pass.aspx>
- Socio-Economic Panel (SOEP): An annual longitudinal survey of the German Institute for Economic Research (DIW), since 1984 for West Germany and 1990 for East Germany, with a focus on the social and economic situation of unemployed and employed persons. Regular surveys focus on social networks and health. <http://www.diw.de/en/soep>

(continued)

Panel on poverty dynamics and the labour market: A nationwide qualitative long-term study on changes in the lives and living conditions of recipients of basic income support for jobseekers in connection with activation strategies. It includes narrative interviews on the influence of the assistance system on life contexts in multi-person communities and on overcoming or consolidating integration problems of benefit recipients with a migration background. <https://www.iab.de/en/forschung-und-beratung/projektetails.aspx/Projektetails/k140110309>

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Social Networks and the Health of Single Parents



Sylvia Keim-Klärner 

Overview

- Single parents have worse mental and physical health than married parents.
- The relevance of social relationships and social support for the well-being and health of single parents has been widely documented.
- The relevance of social networks and their characteristics has also been shown in a few studies. But overall, studies that use network analytical methods are rare.
- However, network studies on the health of single parents are particularly relevant because:
 - We know little about the relationship between specific network structures and the health of single parents.
 - They go beyond the concept of social support and include other mechanisms of action.
 - They also consider negative and ambivalent relationship contents and thus do particular justice to the complexity of social networks of relationships and contribute to a closer examination of the interplay of supportive and conflictual relationships.
 - We still know little about the circumstances under which and the extent to which social networks are capable of compensating for social inequalities so that they do not become relevant to health.

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1 Introduction

Single parent families, which are mothers or fathers who live together with their children but without a partner in the same household, are no longer rare. Over the past decades single parent households have become established in most OECD countries, with Latvia having the highest proportion of children living with a single parent (27.8%), closely followed by Lithuania (26.9%), and the U.S. (26.6%), while countries such as Greece (7.4%), Switzerland (7.1%), and Turkey (5.8%) have the lowest proportion. On average 16.9% of children in OECD countries live with a single parent (OECD, 2020a).

Even though being a single parent is more common and less socially stigmatized than in earlier times, raising children as a single adult in the household does have very specific risks. The average poverty rate in single parent households in all OECD countries is at 32.5%. This is three times higher than the average poverty rate in households with two adults (9.8%) (OECD, 2020b). The health of single parents is also worse than that of parents living in partnerships, as we will discuss in more detail in the following section.

The particularly high risk of poverty and the higher health risk compared to other family structures makes single parenthood interesting for research in social and health inequalities. The question arises as to how the high poverty and health risks can be explained for this particular group.

In this chapter, we will first present the current state of research on the health of single parents. Then we will look at what is known and unknown about their social integration, social relationships, and social networks. Next, we will address studies that analyze interactions between social networks and the health of single parents, and we will conclude by identifying research gaps and ideas for future research.

2 The Health of Single Parents

The health of single parents has been studied more frequently in recent decades. Due to the low proportion of single fathers in the population, the focus is mostly on single mothers. The picture that these studies have been painting for decades for western industrial countries is clear: Single parents are less healthy than mothers and fathers who live together in their households. This applies to both physical and mental health. For example, single mothers rate their health worse than mothers who live together with a partner (Chiu et al., 2016; Rousou et al., 2013; Van de Velde et al., 2014).

Single mothers often report physical health problems but also psychological ones such as anxiety and depression (Franz et al., 2003; Van de Velde et al., 2014). They also reveal lower well-being and life satisfaction than parents in couple relationships (Kohler et al., 2005; Osborne et al., 2012; Vignoli et al., 2014; Winkelmann & Winkelmann, 1998).

The health behavior of single mothers is considered to be riskier, with the proportion of regular smokers among single mothers almost twice as high (46%) as among married mothers (24%) (Helfferrich et al., 2003, p. 16). Single mothers are also less concerned about healthy eating and are slightly less active in sports than married mothers (Helfferrich et al., 2003, p. 16).

Similar findings on subjective health, physical and psychological complaints, and smoking behavior are also found for single fathers (Benzeval, 1998; Chiu et al., 2016; Cooper et al., 2008; Westin & Westerling, 2006), although occasionally, no difference can be measured between single fathers and fathers in a partnership (Domanska et al., 2013; Helfferrich et al., 2003).

3 Theoretical Explanations for the Poorer Health of Single Parents

When we ask how the higher health burden of single parents can be explained, we often find approaches that point to the poorer socioeconomic living conditions of single parents, such as lower income, poorer material resources, or unemployment (Benzeval, 1998). This also seems to play an important role for single fathers especially (Chiu et al., 2016). However, many of these studies also show that a look at socioeconomic factors alone is insufficient (Benzeval, 1998). Other factors can offer a stronger explanation (Cairney et al., 2003), for example: (1) stress during the separation process or the increased experience of stress in general (Cairney et al., 2003); (2) social stigmatization of single parenthood (Evans et al., 1994); (3) selection effects—ill persons or persons with lower well-being are more likely to become single parents than healthy persons (Gerstel et al., 1985; Riessman & Gerstel, 1985); and (4) social relationships, for example the absence of a confidant, intimate caregiver, or supportive person physically present in the household (Anson, 1989; Brown et al., 1993; Brown & Harris, 1993) or absence of contact with and support of others correlate with limited health and well-being. Such research, which focuses on social contacts and social support for single parents, is discussed in more detail in the following section.

4 Social Relationships of Single Parents

Social relationships and social support have been considered in research on the effects of divorce and separation for several decades. Studies on single parents, who may never have been married or lived in a partnership, and who, unlike divorcees, by definition always have children in the household, are more recent.

Divorce research shows overall that separation from a partner entails a loss of social contacts and their positive effects. Thus, the loss of a partner not only changes

the way everyday life is organized, since a partner is missing in all the tasks involved, but also means that a potential source of emotional support and social esteem is lost (e.g., Gerstel et al., 1985; Myers et al., 1975). Separation also leads to the loss of further contacts (Milardo, 1987) because mutual friends experience loyalty conflicts and maintain friendships with only one of the two partners (Terhell et al., 2004). It is also difficult for many parents to maintain contact with their in-laws after separation (Dearlove, 1999). Often, therefore, social isolation and the loss of social support have long been considered major consequences of divorce (e.g., Jauch, 1977). However, empirical findings on social support after separation are not consistent: some studies find that divorced parents receive increased support from their own parents and continue to receive support from in-laws, while others find a decline in social support (Harknett & Knab, 2007).

Also relevant is how much time has passed since separation. Recent longitudinal studies show a more differentiated picture with regard to the longer term consequences of a separation: Although contact losses occur shortly after the divorce, about half of those surveyed compensate for these losses in the following years. Over time, the number of relatives decreases (probably due to the loss of the in-laws) while contact with friends increases. For men, the support of friends and acquaintances also increases (Terhell et al., 2004).

Divorce is not the only way to become a single parent, and divorced parents do not necessarily live with their children. Thus, the results of divorce research cannot easily be applied to the situation of single parents who entered single parenthood via different paths. For example, it is known that women receive more support from relatives, friends, and neighbors after widowhood than after separation (Kalmijn, 2012). It has also been shown that social networks and the receipt of support differ between divorced and never married single parents (Nestmann & Stiehler, 1998). However, there are hardly any studies that examine the social relationships of single parents differentiated according to their path to single parenthood.

Comparing the social relationships of single parents with those of parents living together in a household reveals a reduced scope in many areas: single parents have fewer contacts with relatives (Cairney et al., 2003; Cochran et al., 1990), fewer contacts with in-laws (Dearlove, 1999), and fewer contacts with friends (Cairney et al., 2003). They are also less active in clubs or organizations (Cairney et al., 2003). Findings on social support are mixed (Lye, 1996): Some studies show that single parents receive less support than parents living with their partner in a household (Cairney et al., 2003; Reeves et al., 1994; Targosz et al., 2003). Other studies show that single mothers in particular receive more support after a divorce (Hogan et al., 1990; Marks & McLanahan, 1993). Single parents, however, can benefit much from social support (Balaji et al., 2007; Harknett, 2006) because childcare support in particular enables many single parents to take up gainful employment and combine family work and employment, thus escaping poverty (Ciabattari, 2007; Cook, 2012).

While support research is mainly concerned with the perception and receipt of certain forms of social support, social network research takes a broader perspective by looking at the importance of social relationships, including the structural characteristics of relationship networks (Smith & Christakis, 2008).

Single parent networks are very heterogeneous in structure and function. Networks can be large and small, dense and less dense, or supportive and less supportive. Socially isolated single parents are rarely found, but those that are found tend to be living in poverty (Campbell et al., 2016; Keim, 2018; Lumino et al., 2016; Niepel, 1994). Contacts lost through separation are often replaced with new friends or by the intensification of existing relationships (Niepel, 1994).

There are contradictory findings on the composition of the networks. There is widespread agreement that those providing support are mostly women (Attree, 2005; Keim, 2018; Niepel, 1994). While some studies show a predominance of relatives (Lumino et al., 2016), other studies present a predominance of friendships (Niepel, 1994). In any case, it becomes clear that the networks are often very heterogeneous in their composition and that the range of variation of different network structures and compositions is large. Studies that develop network typologies are therefore interesting as they provide a differentiated overview on the network characteristics of single parents. However, there are very few of these studies to date; we only found three such studies conducted in Germany and the U.S. Moreover, they are based on very small and very different samples, which makes them hardly comparable: 45 white divorced, mostly working mothers in the U.S. (McLanahan et al., 1981); 20 working and unemployed single parents in Bielefeld, a city in western Germany (Niepel, 1994); and 26 unemployed single parents in Mecklenburg-Western Pomerania, a district in eastern Germany (Keim, 2018).

In their study of divorced mothers, McLanahan et al. (1981) identify three network types: (1) “return to the family of origin,” which are quite small, densely connected, and dominated by relatives; (2) “extended network,” which are quite large, not very dense and heterogeneous in composition; and (3) “maintenance or reestablishment of a conjugal relationship with the ex-partner or a new partner,” or networks that include kin as well as friends that vary in size and density.

In her sample of female single parents, Niepel (1994) distinguishes (1) “friendship networks,” which are relatively small and loosely connected in which friends dominate; (2) “family and friendship networks,” which are rather large and frequently include kin as well as friends; and (3) “family networks,” which are small and dense and mostly include kinship relationships. In her study of unemployed female single parents, Keim (2018) distinguishes four types of networks: (1) “family-oriented;” (2) “conjugal networks;” which both mainly contain own kin (“family-oriented”) or partner’s kin (“conjugal”); (3) “extended networks,” which are large but not very dense and are composed of different relationship types; and (4) “restricted networks,” which are very small and contain a large proportion of institutional helpers.

The three typologies all describe a wide range of variation in single parent networks, from particularly large and low-density networks (“extended network” in McLanahan’s and Keim’s typologies and “family and friendship network” in Niepel’s typology) to small, dense, and kinship-dominated networks. But only the “restricted networks” from Keim’s typology hint towards a certain degree of social isolation of the unemployed single parents studied. However, these networks often

contain institutional helpers who fill important support functions. A typology based on a larger sample has yet to be developed.

To conclude, whether it is a question of social contacts, social relations, social support, or social capital, the studies presented make it clear that single parents have a different social embeddedness than married parents. Concepts such as social support are more often examined, while network analytical studies are rather rare. It is striking that the term “network” is often used here as a metaphor (“support networks”) and can stand for a variety of social relationships and forms of support. Less frequently, in these studies on “support networks” the structure of these relationships is actually examined more closely, and social network analysis is hardly applied.

5 What Is the Role of Social Relationships for the Health of Single Parents?

Many studies in recent decades have shown that social relationships are important for well-being, health, and health behavior (see chapter “[Social Networks and Health Inequalities: A New Perspective for Research](#)”). This also applies to single parents.

The concept of social support has been quite well researched: single parents benefit from the fact that social support helps to alleviate stressful life situations and thus contributes to well-being (Campbell et al., 2016; Ciabattari, 2007; Harknett, 2006). Social support also correlates negatively with specific disease patterns. Thus, lower perceived social support is associated with a higher incidence of depressive symptoms (Cairney et al., 2003; Harknett, 2006) and other mental illnesses (Franz et al., 2003). Compared to mothers in couple relationships, single mothers are not only more exposed to stressors but also have less support (Cairney et al., 2003). The combination of lower social status, higher numbers of stressors, and lower support can almost completely explain the differences in depression propensity between mothers living with an adult in the household and single mothers (Targosz et al., 2003).

A more differentiated picture emerges when the links between social status and social support are analyzed more closely. For persons with lower social status, social support can have a relieving effect. For example, access to social support reduces conflicts in the reconciliation of family and work for unmarried mothers, especially for those with lower social status (Ciabattari, 2007). However, social relationships also generate costs. Support received often has to be reciprocated, which can be particularly difficult for people with lower social status, such as unemployed single parents. Reciprocity expectations exert social pressure, which not only puts a strain on an individual’s well-being, but in the longer term can also lead to contact breakdowns and the loss of social support (Andreotti, 2006; Cook, 2012). Whether active renunciation of support or lack of access to support opportunities, individual disadvantage is reinforced by such relationship effects: for single parents with little

education, in precarious employment and poverty situations, the support they need most is least available (Brown & Moran, 1997; Harknett, 2006). This lack of support is in turn closely related to mental illness (Simons et al., 1993).

Sociological network research, which deals with relationship structures and their effects and considers social mechanisms that go beyond social support (cf. Berkman & Glass, 2000), is still very rare in single parent research.

Nevertheless, some studies show that social networks are particularly relevant for explaining health differences between single and coupled parents. For example, the study by Gerstel et al. (1985) shows that the characteristics of social networks can explain the relationship between marital status (divorced or married) and mental health to a high degree (Gerstel et al., 1985, p. 95).

Findings on the exact effect of specific measures of network structure on the health of single parents are rare and often inconsistent. On the one hand, in some studies, large networks are associated with happiness and well-being in divorced couples, regardless of the content exchanged in these networks, and in women, large networks are also associated with better mental health (Gerstel et al., 1985). On the other hand, for single mothers, smaller networks offer better support than larger ones (Malo, 1994), thus one may assume that small networks could have more positive health effects. Exactly how network size affects health is still an open question—it may be less a matter of size but more a matter of quality of relationships. Additionally, it is important to note that the studies mentioned are cross-sectional studies that cannot make any statements about cause and effect. It is therefore conceivable that large networks have a protective effect and that women who are less burdened mentally are more likely to maintain larger networks.

With regard to network density, initial findings show that common theoretical considerations about the role of network density and social support do not necessarily apply to single parents. It is generally assumed that dense networks are more likely to provide instrumental and emotional support than less dense ones, and that sparser networks are more positively related to access to information and new social contacts (Granovetter, 1973; Mitchell, 1969). One could therefore assume that single parents embedded in dense networks profit especially from instrumental and emotional support, which helps them deal with raising their children alone. According to a 1981 study by McLanahan, Wedemeyer, and Adelberg, single parents find support from relatives (who usually form dense networks) less satisfying than support from friends in a low-density network. A dense network with many relatives is associated with a lower quality of life for single parents (Leslie & Grady, 1985). Networks not as dense provide more flexible support and therefore help individuals cope better with new situations—men in particular are better protected from mental illness after divorce (Gerstel et al., 1985).

Network research not only opens our eyes to the complexities of networks structures and the functions of supportive social relationships but also to negative or ambivalent relationship content (see chapter “[Negative Ties and Inequalities in Health](#)”). Thus, social relationships can be not only supportive but also conflictual, oftentimes both simultaneously. In the context of separation and divorce processes, negative or ambivalent relationships are particularly relevant since conflict-ridden

relationships with former partners but also their parents, relatives, or friends cannot be easily cut off, as these family members are often important caregivers for the divorced person's own children. Also, conflicts with own kin can come up with separation. Studies on single parents that include negative aspects of social relationships are rare. The study by Gerstel et al. (1985) not only looks at individual support dimensions but also whether social relationships are perceived as a burden. The analysis shows that networks that are not perceived as a burden are associated with a lower risk of mental illness (Gerstel et al., 1985). The study by Samuelsson (1994) also shows that conflicts and negative contacts are a burden on mental health. Empirically, we know little about the interaction of support and conflicts in their health consequences, not only among single parents. Recent research shows that social conflicts do not correlate with well-being for students who receive a high level of support, while social conflicts have a negative impact on well-being for people who receive little support (Abbey et al., 2010). Further research is needed here.

In a particularly differentiated analysis of network structures and their effect on the individual well-being of divorced mothers, McLanahan et al. (1981) formed a network typology in which each of the four network types is related in its specific way to the health of single parents. The key factor in determining whether the network structure is perceived as promoting or hindering health is not the structure itself, but whether it fits the role orientation and support needs of the divorced mothers. The authors therefore argue that specific network structures and support options do not necessarily have the same health promoting or impairing effect on all—support needs are what matter.

Keim (2018) shows that there are two types of network structures among unemployed single parents that are generally associated with particularly high or low levels of well-being. These networks are large and low-density “extended networks” that exhibit a high degree of heterogeneity and come with high levels of well-being. Persons who are involved in such networks receive a wide range of social support services and are also themselves able to support their network partners and thus maintain reciprocal relationships. Interactions between well-being and network structure are also found here. The support that is assessed as helpful promotes well-being, but the high level of well-being and the low level of stress also contribute to being able to maintain reciprocal support relationships, to approach conflicts constructively, and to dare to build new relationships. There are also “limited networks,” which are small networks with a high proportion of institutional helpers that come with low levels of well-being. Respondents who are embedded in these networks can often only receive support that is assessed as helpful through the use of institutional helpers, but the support can only partially buffer the perceived burdens for a short period of time, and well-being is very limited compared to the other single parents surveyed. Active network maintenance, for example, by providing support or establishing new contacts, is hardly possible. Between these two poles, there are two types of networks in which kinship contacts to the family of origin or the family of the old/new partner dominate. Here, stressful situations occur more often than with persons with extended networks, but these can usually be buffered quite well by

the support in the networks when there is enough time and energy for the care of the existing, and the development of new, relationships.

6 Conclusion and Research Desiderata

Our short overview shows that there are a number of studies advancing our knowledge on single parents' health and well-being by analyzing their social relationships and social networks. However, there is still a need for further research, which is discussed in the following paragraphs:

1. The paths to single parenthood are varied, and findings from divorce research on both health and social relationships are not necessarily applicable to single parents who have never been married, never lived in a relationship, or are widowed. Also, living arrangements as a single parent may be organized very differently, therefore custody and contact rights should also be considered. Models of alternation (the child lives with both mother and father for a time, or lives with the other parent every other weekend) certainly offer other advantages and challenges than the sole right of custody and contact and are linked to other forms of social integration or social stress.
2. Studies focusing on the role of social relationships for the health of single parents usually deal with concepts such as social support. Structural network analyses are rare. There is still a need for research in this area, for example:
 - (a) How do network structures change with the transition to a life as a single parent?
 - (b) What role do specific network structures play for health? In addition to single burdening and/or supporting relationships, are there structures of the entire network that have a particularly burdening or supportive health effect?
 - (c) Which social network mechanisms are relevant besides social support (see chapter "[Social Network Mechanisms](#)")?
3. The role of social networks in reproducing or compensating for social and health inequalities for single parents has hardly been researched.

The empirical research points in two directions: On the one hand, economic deprivation often goes hand in hand with a smaller network that can provide less support. Since a lack of both economic and social resources can have a negative impact on health, and since poor health in turn has a negative impact on the endowment of resources, there is evidence of a downward spiral in which resource endowment and health are steadily deteriorating. On the other hand, empirical studies also show compensating effects. Establishing new contacts and intensifying those already available can compensate for contact losses resulting from separation. Additionally, social resources can compensate for a lack of economic resources. Thus, social networks of single parents could have a health-promoting effect by buffering negative health effects of separation,

poverty, and social inequality. However, it is unclear to what extent and under what conditions they do so or under what conditions a negative spiral develops.

- (a) Particularly desirable would be longitudinal studies that analyze short- and long-term changes in lifestyle, social status, social networks, and health in their conditions and consequences.
 - (b) However, cross-sectional surveys, for example, among single parents with different social status or different lengths of participation in the lifestyle, are also useful and can show the extent to which these groups differ in their network structure and health.
 - (c) Qualitative studies can shed light on the relevance of social relationships and specific network structures for single parents. They allow identifying in much detail the ways in which social networks affect health. Additionally, they can explore how and under which conditions social networks contribute to the reproduction of social and health inequalities or compensate for those inequalities. There is also a lack of in-depth qualitative studies that can illuminate how people from different social classes deal with separation and what this means for their social relationships.
 - (d) Often social relationships are only examined in their beneficial effects, but they can contain conflicts and trigger stress. Accepting support can be a burden especially for single parents with a lower social status. These negative aspects of social relationships (see chapter “[Negative Ties and Inequalities in Health](#)”) are still far too rarely included in network studies. So, the question is: How can the complex interplay of support and conflicts in social networks be grasped, and what role do concrete network structures play in this for network effects on health?
4. Support networks are not only of a private nature. Institutional support is also provided for single parents. There is a need for research into the interaction of private and institutionalized support. This raises the question of whether institutionalized support displaces private support and thus further weakens the social fabric and the availability of resources, or whether it does not make support possible in the first place, especially in situations of severe stress, since individual supporters are no longer overburdened by the necessary support.

Reading Recommendations

Gerstel, N., Kohler Riessman, C., & Rosenfield, S. (1985). Explaining the symptomatology of separated and divorced women and men: The role of material conditions and social networks. *Social Forces*, 64(1), 84–101. *This U.S. study from the 1980s is interested in the ways in which marriages have a health-protective effect. The authors analyze data from the Northern California Community Study on the health of married and divorced or*

(continued)

separated persons. This is an early study with a network analytical perspective, which specifically examines network structures. It shows the explanatory power of social networks for differences between married and divorced persons and the health-protective effect of networks of lower density.

Harknett, K. (2006). The relationship between private safety nets and economic outcomes among single mothers. *Journal of Marriage and Family*, 68(1), 172–191. *Using U.S. data, the author shows that single parents with little education, in precarious employment and in poverty, need support the most but have it least available. In her view, disadvantages at the meso-level of social relations thus reinforce disadvantages at the individual level.*

McLanahan, S. S., Wedemeyer, N. V., & Adelberg, T. (1981). Network structure, social support, and psychological well-being in the single-parent family. *Journal of Marriage and the Family*, 43(3), 601–618.

Keim, S. (2018). Are lone mothers also lonely mothers? Social networks of unemployed lone mothers in eastern Germany. In L. Bernardi & D. Mortelmans (Eds.), *Lone parenthood in the life course* (pp. 111–140). Springer Open.

These two method-integrative network analytical studies (from the U.S. and Germany) analyze the structures and functions of social networks of single parents/divorcees in very differentiated ways and examine their effects on well-being and health. They both display a typology of social networks.

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Gender and Health Inequalities: Social Networks in the Context of Health and Health Behavior



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Overview

- There are significant differences in morbidity (incidence of disease) and mortality (death rate) between men and women.
- By puberty, male adolescents are more likely to have health problems.
- During puberty, girls suffer from chronic and mental illnesses and male adolescents are more likely to suffer from acute and life-threatening diseases (e.g., HIV).
- Boys and men have riskier health behavior.
- The field of research mainly relates to the binarity of the sexes—men and women. Studies on trans¹ and queer² persons are rare in this field.
- Networks have a gender-specific effect on risk behavior.

(continued)

¹“An umbrella term for people whose gender identity differs from the sex they were assigned at birth. The term transgender is not indicative of gender expression, sexual orientation, hormonal makeup, physical anatomy, or how one is perceived in daily life” (TSER, 2020).

²“An umbrella term for gender and sexual minorities who are not cisgender and/or heterosexual. There is a lot of overlap between queer and trans identities, but not all queer people are trans and not

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- Women provide more and more time-consuming social support, even in case of illness.
- After widowhood, networks have both negative and positive effects, which are gender-specific.

1 Gender as a Category of Inequality

Gender has become one of the most important categories in social science discourse. Gender permeates and shapes all areas of social life and influences social order and social positioning (Johnson et al., 2009). For females and males, gender “*are gender-specific conceptions of normality, standards of behavior and scripts of staging with which they have to come to terms incessantly throughout their lives*” (Rose, 2015, p. 63). In everyday knowledge, the gender binary (male and female) as well as gender affiliation and the assumption of heterosexuality is accepted and practiced as self-evident.

However, gender is a social as well as historical construct and grown phenomenon that is (re)produced in social and everyday interactions and actions (*doing gender*). Gender classifies individuals into different groups, which are based on a biologically bound allocation and on social attribution processes. Against this background, it is important to distinguish between *sex* (the sex assigned at birth based on biological characteristics) and *gender* (as a social and cultural dimension) (Mauvais-Jarvis et al., 2020; Johnson et al., 2009). The subdivision enables the reflection of gender and the differences between men and women as non-biological, but as a social and cultural construct. Gender can be considered as “*a system of social practices within society that constitutes people as different in socially significant ways and organizes relations of inequality on the basis of that difference*” (Ridgeway & Smith-Lovin, 1999, p. 192). Gender inequality and restrictive gender norms have impact on health and health-related behaviors as well as access to healthcare. On the other hand, social systems (e.g., healthcare systems) reinforce and reproduce gender inequalities along with their implications (Heise et al., 2019; Courtenay, 2000).

1.1 Gender and Health

Since the 1970s, the topic of gender and its influence on health has gained in influence in research and in medical practice (Charles & Walters, 2008; Read & Gorman, 2010). A large number of studies have shown that there are sometimes

all trans people are queer. The word queer is still sometimes used as a hateful slur, so although it has mostly been reclaimed, be careful with its use” (TSER, 2020).

pronounced gender differences with regard to health, that is, in morbidity (frequency of illness) and mortality (death rate), in the processes by which illnesses develop, and in the course of illness and health behavior, men and women appear to differ significantly (Charles & Walters, 2008; Robert Koch Institut, 2015). Studies on trans-persons are rather rare. Most of the available research covers the whole group LGBTIQ: Lesbian, Gay, Bisexual, Transgender, Intersexual, and Queer.

1.1.1 Life Expectancy and Mortality

In most countries around the world, there is a homogeneous pattern of life expectancy: At all ages men have shorter life expectancies than women (Bambra et al., 2009; World Health Organization, 2019). For the years 2015–2020, the United Nations was able to determine the following exemplary life expectancies measured in years: Afghanistan (male (m): 62.7; female (f): 65.6), Brazil (m: 72.2; f: 79.4), Japan (m: 80.7; f: 87.1), Canada (m: 80.7; f: 84.4), Estonia (m: 73.01; f: 81.9), Kenya (m: 64.9; f: 69.6), and New Zealand (m: 80.4; f: 83.7) (UNdata, 2017). Also in Germany, the average life expectancy for women at birth is currently 83.1 years and for men, 78.3 years (Federal Statistical Office, 2019b; Robert Koch Institut, 2015). In recent years, gender differences have converged in favor of the male sex (Robert Koch Institut, 2017; World Health Organization Europe, 2018), which is attributed to the increase in health-risk behavior among women (e.g., rising number of smoking women). The shorter life expectancy of the male gender persists. For example, worldwide male infants also show a higher risk of death than female infants (World Health Organization, 2019). The unfavorable mortality statistics for men continues in the further course of life and becomes particularly apparent between the ages of 25 and 65. In Germany, almost twice as many men (86,654) died in middle age in 2016 as women (46,815) (Federal Statistical Office, 2019c). The gender gap for premature mortality can also be established for other European countries, for example, Armenia (f: 297 per 100,000 population; m: 690 per 100,000), Spain (f: 136 per 100,000; m: 288 per 100,000), and Finland (f: 151 per 100,000; m: 290 per 100,000) (World Health Organization Europe, 2020e, 2020f). The gender gap in excess mortality is justified by the more frequent health-risk behavior of men (Barry & Yuill, 2016; Bartley, 2017; Charles & Walters, 2008).

There are also gender differences in the context of diverse causes of death. Women die more frequently from cerebrovascular diseases, but less often from malignant neoplasms. There are only slight gender differences in respiratory or digestive system diseases (Robert Koch Institut, 2015). An enormous gender-specific difference can be confirmed for suicide and intentional self-harm. In 2017, 9235 people in Germany committed suicide, where the proportion of men was three times higher, at 75%, than the proportion of women, at 25% (Federal Statistical Office, 2019a, 2019d). This proportion was confirmed in other countries, for example, Israel, Kazakhstan, Republic of Moldova, and The Netherlands (World Health Organization Europe, 2020a, 2020b).

1.1.2 Morbidity

Gender differences in health are also well documented in terms of morbidity (Bambra et al., 2009; World Health Organization, 2019). According to Hurrelmann and Quenzel (2011), health differences between girls and boys already occur from the first year of life until the age of sexual maturity at about 12 years: Boys perform worse than girls in most health indicators. In Germany, for example, more boys than girls up to the age of 15 were examined by medical professionals for health problems (Federal Statistical Office, 2019c; Hurrelmann & Quenzel, 2011; Robert Koch Institut, 2015). The United Nations Children's Fund (UNICEF) review (2015) comes to similar conclusions: "Overall, in 40 out of the 67 countries a higher proportion of boys compared to girls were taken to a health-care facility" (Nair et al., 2015, p. 8). Gender-specific differences in childhood can also be shown in the incidence of illness (Hurrelmann & Quenzel, 2011). According to the Federal Statistical Office in Germany, boys at the age of 1–15 years suffer more than girls from leukemia, epilepsy, chronic diseases of the lower respiratory tract, such as bronchial asthma, obesity, and sleep disorders. A greater susceptibility of the male gender is also observed in the area of mental illness, for example, in Germany (Federal Statistical Office, 2019c; Hurrelmann & Quenzel, 2011; Robert Koch Institut, 2015) and England (Sadler et al., 2018) and could be shown in an international systematic review similarly (Bor et al., 2014) (see chapter "[Social Networks, Family Social Capital, and Child Health](#)"). Transgender children and gender nonconforming (TGNC) children are strongly affected by mental health problems (Becerra-Culqui et al., 2018).

Even mental health problems like, for example, anxiety, depression, headaches, dizziness, and staggering and functional somatic symptoms increased among both boys and girls (Collishaw & Sellers, 2020). Girls aged 15 years and older suffer more from psychosomatic and physiological complaints than boys at the same age. The results can be found in Germany (Hurrelmann & Quenzel, 2011; Federal Statistical Office (2019c), Belgium (van Droogenbroeck et al., 2018), England (Sadler et al., 2018), Norway (Moksnes & Reidunsdatter, 2019), Sweden (Giota & Gustafsson, 2017), the USA (Mojtabai et al., 2016), and in other western countries (Collishaw, 2015). Studies from Canada (Veale et al., 2017) and the USA (Becerra-Culqui et al., 2018; Nahata et al., 2017) show that TGNC youth had a higher risk of reporting psychological distress, self-harm, major depressive episodes, and suicide compared to the age subgroups (see chapter "[Social Networks, Health, and Health Inequalities in Youth](#)").

The gender-specific tendency continues into adulthood (18–65 years) and refers to the subjective self-assessment of health. According to the World Health Organization Europe (2020c, 2020d) female persons in Europe assess their health less often as good than male persons do, for example, in Bulgaria (f: 61.7%; m: 77.9%), Cyprus (f: 79.1%; m: 81.3%), and Luxembourg (f: 68.1%; m: 72.4%).

Gender-specific differences can also be identified in the context of chronic diseases. Regitz-Zagrosek (2017) and Mauvais-Jarvis et al. (2020) emphasize that the female disease profile is more likely to be influenced by chronic diseases and by psychosomatic as well as psychological impairments (e.g., thyroid diseases, depression, eating disorders, migraine, hypertension, gallbladder diseases, arthritis, osteoporosis, and Alzheimer's disease). The male profile is characterized by acute and life-threatening diseases (e.g., HIV infection, malignant neoplasms of the digestive organs as well as the lungs and bronchi, pulmonary emphysema, liver cirrhosis, heart disease). A meta-analysis of transpeople indicates that transperson men³ in particular are strongly affected by HIV/AIDS. There are also connections with other risk factors such as prostitution or discrimination (Herbst et al., 2008). Overall, LGBTIQ persons show a high risk for intestinal diseases (e.g., giardia, amoeba), hepatitis A and B, human papilloma viruses,⁴ and anal carcinoma (anal cancer) (Dean et al., 2000).

Heart disease, especially ischemic heart disease, plays a significant role in the context of gender differences and health. According to current studies, ischemic heart disease is the most recognized example for integrating the concept of gender and sex. Differences between the genders exist in almost every stage of the disease, for example, in risk factors as well as in the pathogenesis and treatment (Mauvais-Jarvis et al., 2020; Regitz-Zagrosek, 2017). Women suffering from ischemic heart disease are less likely to receive evidence-based treatment or invasive diagnostics (Fernandes et al., 2009; Kuhlmann, 2016; Mauvais-Jarvis et al., 2020).

Gender-specific differences can also be described with mental illness. According to data from Mauvais-Jarvis et al. (2020) and the Robert Koch Institute (2015), the prevalence of anxiety disorders is twice as high in women than in men. A similar picture emerges for depressive disorders (Mauvais-Jarvis et al., 2020). Even though there is hardly any research on completed suicide and suicide risks among transpeople, the very detailed review by Haas et al. (2010) shows an increased suicide risk as well as an increased number of completed suicides for transpeople (Clements-Nolle et al., 2006; Toomey et al., 2018). This is probably especially true for young adolescents (Mustanski et al., 2010). Compared to the general population, transpeople also have higher prevalence rates for depression and anxiety disorders, among other things (Borgogna et al., 2019; Witcomb et al., 2018).

Few gender differences are seen in old age. In connection with multimorbidity, the female gender scores significantly lower—women who suffer from multiple chronic diseases such as osteoporosis, osteoarthritis, and heart failure. Older men have significantly higher prevalence of life-threatening diseases such as heart attacks, strokes, and chronic obstructive pulmonary disease (Alharbi et al., 2020; Iller & Wienberg, 2012) (see chapter “[Social Networks and Health Inequalities in](#)

³Person who identify themselves as male, but were assigned female at birth (Trans Student Educational Resources, 2020).

⁴These viruses can infect skin and various mucous membranes and cause uncontrolled tumor-like growth.

Old Age”). Graham et al. (2011) summarize individual aspects of transpeople in the different phases of life but claim to be unable to provide any results. However, Fredriksen-Goldsen et al. (2014) found that “*Transgender older adults were at significantly higher risk of poor physical health, disability, depressive symptomatology, and perceived stress compared with nontransgender participants*” (p. 488).

1.2 Gender and Health Behavior

According to Crimmins et al. (2011), European Institute for Gender Equality (2017), and Kuhlmann (2016), cultural and social factors influence the use of health services and lead in some cases to significant gender differences in almost all areas of the healthcare system. For example, more women participate in health courses offered by adult education centers and health insurance companies (European Institute for Gender Equality, 2017; Robert Koch Institute, 2015), although these courses are likely to be primarily aimed at the needs of women and disadvantage men (Kuhlmann, 2016).

Gender differences can also be demonstrated with regard to utilization of inpatient medical care. Rommel et al. (2017) verify this fact for Germany. A gender difference is particularly evident in young adulthood: 15% of women and 9% of men aged between 18 and 29 were admitted to hospital during the last 12 months. Hardly any differences between the genders can be detected among 65-year-olds and older people (f: 25.8%; m: 25.9%).

The utilization of psychiatric and psychotherapeutic services occupies a special position in the context of gender differences. According to Barry and Yuill (2016), Gagné et al. (2014), and (Rommel et al., 2017), men are particularly reluctant to consult or report a mental illness, which the authors attribute to the prevailing gender stereotype in society (Barry & Yuill, 2016).

Smoking is one of the major risk factors for health and the leading cause of premature mortality. According to Zeiher et al. (2017), 20.8% of women and 27.0% of men in Germany smoke at least occasionally, while 52.6% of women and 38.0% of men have never smoked. A similar ratio appeared in other European countries, also to the disadvantage of the male gender. For example, in France in 2016, 30.1% of the female population and 35.6% of the male population reported (occasional) smoking. In Belarus, the gender difference is even greater: 46.1% of men but only 10.5% of women smoke (World Health Organization Europe, 2020g, 2020h). According to the Robert Koch Institute (2015), however, the smoking rate of the genders has converged over the last 20 years due to the increase in female smokers. The increase in the female smoking rate can be explained by the change of the gender roles and gender stereotypes (Bartley, 2017; Kolip & Hurrelmann, 2016).

Also, consumption of alcohol shows considerable gender inequalities at all ages. According to the Global Status Report on Alcohol and Health, “[m]en generally drink considerably more alcohol than women, both on heavier-drinking occasions and in terms of the volume of drinking; the gender difference is generally greater

where there is greater gender inequality” (World Health Organization, 2018, p. 14). Gender differentiation can also be identified in the context of alcohol use disorder. In 2016, for example, globally an estimated 46 million women and 237 million men suffered from alcohol use disorder (World Health Organization, 2018). Social differences have a significant influence on alcohol consumption: The gender differentiation is often greater among poorer people than among richer ones (Bloomfield et al., 2006).

Hardly any research has examined the consumption of substances by transperson teenagers and transperson adolescents. Most existing studies refer to the group of LGBTIQ persons. However, a study on young LGBTIQ women in San Francisco shows that substance use is very common among transperson female⁵ adolescents and that is significantly associated with psychosocial risk factors (Rowe et al., 2015). A long-term study in the USA was subsequently able to show that alcohol consumption increased linearly over time. Male LGBTIQ adolescents tended to increase faster than female adolescents (Newcomb et al., 2012). The abuse of prescription opioids and tranquilizers is already evident in LGBTIQ adolescents at a young age (Kecojevic et al., 2012). Furthermore, another U.S. study provides evidence that the abuse of prescription drugs occurs relatively frequently in LGBTIQ adults and is strongly associated with emotional stress (Benotsch et al., 2013).

1.3 Selected Explanatory Approaches in the Context of Gender-Specific Health Differences

As clearly as the gender-specific health differences could be shown, the identification of the causes is just as difficult. Many questions could not yet be clarified in this context. Three explanatory approaches are presented below.

1.3.1 Gender-Specific Role Conceptions and Stereotypes

In recent years, the influence of social constructions of gender on health has been discussed in scientific discourses (Barry & Yuill, 2016; Charles & Walters, 2008). According to Sieverding (2005, p. 57), there is a broad consensus that gender differences in physical health and illness are most strongly rooted in gender differences in health-related behavior, especially in the higher risk behavior of men. A large number of socio-cultural factors influences health-related behavior. In this context, social gender roles and stereotypes are attributed a key function (Barry & Yuill, 2016). For example, the female gender is still considered to play a more caring and health-conscious role in the context of health. In contrast, the construction of the

⁵Person who identify themselves as female, but were assigned male at birth.

male gender is based on being able to solve health problems independently and without external help (Barry & Yuill, 2016; Charles & Walters, 2008).

1.3.2 Discrimination

Gender stereotypes and roles in society also have an impact on the assessment of other people. It is suspected that medical professionals perceive and treat patients differently based on their gender. Studies indicate that healthcare professionals take male complaints more seriously. On the other hand, the female gender is apparently more often suspected of having psychological problems and the treatment is designed accordingly (Mauvais-Jarvis et al., 2020). According to Homan (2019), women “*are less likely than men to receive the most effective, advanced treatments and diagnostic procedures available for a variety of health conditions*” (p. 487). A qualitative study shows that hospital staff often react to the health needs of transperson patients with uncertainty, which can be expressed in stigmatization. This, in turn, leads transpeople to believe that their needs are not understood (Poteat et al., 2013). A review of 17 articles on the attitudes of caregivers toward LGBTIQ patients confirmed discrimination (Dorsen, 2012; Grant et al., 2011).

1.3.3 Poverty and Social Inequality

Poverty and social inequality have a key impact on gender health and life expectancy and lead to gender gaps. Women still receive 20% less in wages than men in most countries of the world. They continue to be more often affected by poverty and do twice as much housework and child care than men. These gender inequalities and the social conditions in which people work and live have a significant impact on the health of a country’s population (Homan, 2019; International Labour Organization, 2019). This effect becomes clear, for example, in self-rated health. Pinillos-Franco and Somarriba (2019) found that women “*tend to report poorer health compared to men, which might be due to women balancing their work and family life by working more hours*” (p. 258). A U.S. study found that the unemployment rate among transpeople is twice as high as in the general population. This reduces their likelihood of being covered by health insurance, on the one hand, and being covered by a company’s general insurance on the other (Grant et al., 2011).

2 Gender and Social Networks: An Overview

In the 1970s, it was assumed that women and men have different attitudes toward social contacts (e.g., Miller, 1976), without having any large-scale network studies to support this thesis. It was not until the 1980s when there was an increase in quantitative and qualitative research with an explicit gender orientation, and gender

also became increasingly important in network research. Gender has become an inequality variable that is very well studied compared to most of the other characteristics presented in this book. Due to the large number of studies, and because gender is often used as a control variable within quantitative network research, the current list can only give a brief overview of the research and point to empirical approaches and gaps. It should be noted that the search for differences is still primarily based on a binary difference scheme of man/boy vs. woman/girl and thus gender identities such as transgender or queer have hardly been considered.

2.1 Social Networks and Age

Gender, according to research on friendship and school, is an important variable in friendship formation. Martin et al. (2013) show that the choice of play partners for *pre-school children* falls disproportionately on same-sex children. Also, regarding networks of young *adolescents* (McPherson et al., 2001) and in the first years of secondary school (Lubbers & Snijders, 2007), there is still a very strong separation between the sexes (high gender homophily), which decreases over the years but is nevertheless maintained. As people get older, these homogeneous networks slowly dissolve and more gender heterogeneous groups emerge (Feiring, 1999). Studies by Lubbers and Snijders (2007) also show a low proportion of love relationships or sexual relationships in secondary school, while these are more pronounced in high school (Bearman et al., 2004). In both studies, these sexual or relationship networks are predominantly heterosexual, thus increasing the proportion of opposite sex alters in the network.

For *older people*, exemplarily in the family networks of older Mexicans, the study by Fuller-Iglesias and Antonucci (2016) shows no gender differences (proximity, shares in the network). In contrast, Schwartz and Litwin (2018), using the Europe-wide longitudinal survey “Health, Ageing, and Retirement in Europe” ($n = 13.938$), find an increase in network relationships over time for people aged 65 and older, especially for women, who are less involved in family networks.

2.2 Life Cycle and the Composition of Social Networks

With regard to life cycle, various research findings paint the following picture. In the study by Fischer and Oliker (1983), a few differences between the sexes after adolescence can be found. For example, women have more contact with relatives, while men name more employees and colleagues as network partners. Differences become visible in the life cycle. In the case of *early marriage* and parenthood, friendship networks shrink more for women than for men. After the birth of children, the networks of men get smaller compared to women. “Further evidence suggests that this interaction effect can be explained by both structural and dispositional

factors, the former working to reduce women's friendships relative to men's in the earlier period and the latter expanding their friendships later on" (Fischer & Oliner, 1983, p. 132). Munch et al. (1997) found that social norms regarding the upbringing of children in Western countries have an impact on network structures. While the birth of a child did not have a statistically significant influence on the size of the network of men, a significant negative influence on the size of the network of women was observed.

2.3 Gender Differences in Network Structures Regarding the General Population

In addition to studies on life phases, various studies have existed since the 1980s that investigate the question of gender differences regarding social networks in the general population. One example is the much-cited study by Fischer (1982) "To Dwell Among Friends—Personal Networks in Town and City," which highlights the gender effect on networks: "*Women tend to be involved in networks with more relatives and to have more intimate ties than did otherwise similar men. Young women, particular mothers, were more constricted in various ways, such as in the number of the 'just friend' they had [. . .]*" (p. 253).

In contrast to Fischer, Gillespie et al. (2015) found no significant gender differences in the number of girlfriends, the number of alters with whom one celebrates birthdays, intimate affairs (e.g., sex life), or problems discussed late at night. However, the number of friendships varied considerably according to marital status, age, and parental status (see above). It is noteworthy that each of the respondents can name at least one close friend.

Other studies with the same focus drew on data from the General Social Survey (GSS) in the USA to find out how networks can be described in the U.S. population. Marsden's study (1987) explores the question of differences in the variables of age, education, race, gender, and size of residence. As a result, the networks of young, well-educated, and metropolitan residents appear to be the largest. Gender differences are found primarily in the composition of the network of relatives and non-relatives; for example, the proportion of family members is greater among women. Similar results can be found in a somewhat older study by Moore (1990). Even after controlling for variables related to employment, social structural positions, family, and age, women had a larger proportion of kinship relationships and a smaller proportion of acquaintance relationships in the network and a greater diversity of family relationships than men. These differences are attributed to different structural relationship contexts or locations, which exert certain possibilities for and limitations on the formation of close social relationships. Indeed, gender differences in network composition and structure disappear when employment and family status and age are statistically controlled. Nevertheless, the empirical finding remains that women's networks contain a higher number, proportion, and diversity of kinship relationships than men's networks.

A study in Singapore shows that men and women are more likely to encounter professional contacts that are dominated by their own gender (bipolar: man or woman). For example, women are more likely to meet male nurses because they are overrepresented in nursing care, although different life stages have an influence on this. After the birth of a child, women also come into contact with professional groups in which they are underrepresented, such as teachers, which in turn affects the composition of the network (Chua et al., 2016).

The gender aspect seems to have lost its impact on the differences in network formation in recent years. While women still have slightly larger networks than men and have more conversations about important matters with relatives, they now also have more relationships outside the family. Women thus no longer have a clearly kinship-oriented discussion network than men and are less frequently socially isolated (McPherson et al., 2006). This is also confirmed by Fuller-Iglesias and Antonucci (2016) for 18–99-year-old Mexican women.

However, some findings are being questioned. For example, some critics point to the strong interviewer effect in the GSS survey (Fischer, 2009), while others question the name generators used and note, for example, that women may have more important things to discuss than men and may therefore have a larger network (Bearman & Parigi, 2004).

2.4 Network Resources and Gender Differences

In addition to describing the structure, many studies are looking into the question of what resources the networks can make available. This is done at different levels:

1. On a general social level. Here, an attempt is made to determine the extent to which the distribution of resources in the general population differs between the sexes.
2. At the organizational level. The extent to which integration into social networks influences success—usually professional success—is investigated.

2.4.1 Social Support and Resource Allocation

Gillespie et al. (2015) show that men and women have equal access to emotional support. Moore (1990) shows similar results. However, Bearman and Parigi (2004) point out that when it comes to “important things to discuss,” women do name more persons than men. The study on social support by Turner and Marino (1994) supports both a life cycle and a gender effect: women state that they receive more social support from employees, relatives, and friends than men. Vyncke et al. (2014) show contradictions in this respect regarding the available social capital of women and men. Men can activate significantly more resources in the network and report more potential support relationships and more network partners promoting healthy

lifestyles. Hobfoll and Vaux (1993), on the other hand, conclude on the basis of various studies that women are more involved in social support interactions. They are more adept at support processes and therefore often have more intimate relationships and larger support networks. Women spend more time in social interactions, are more likely to share feelings and personal concerns, and are more likely to report receiving social support.

Walen and Lachman (2000) find in their study of 2348 adults (aged 25–75) in relationships that women report more support from family and friends, whereas men are more likely to receive support from their partner. In addition, Diewald (1991) uses the analysis of five representative population surveys to establish that women have more contact persons available to them in most forms of life than men. This was particularly true for single, single parents, divorced, and widowed women. According to Barker et al. (1990), women are more likely than men to seek support from close and distant relatives, friends, and neighbors.

When it comes to receiving aid, the preferences of women and men seem inconsistent. While Antonucci et al. (1998) and Lenz (2003) show that women prefer their own gender when seeking support, other researchers also show contradictory findings. Although women tend to consider intra-family helpers, such as the sister, or extra-family female helpers, such as the neighbor (Nestmann & Schmerl, 1992), women are generally the central “donors.” For example, in the study by Veiel and Herrle (1991), both students and depressed patients and parents of children with cancer are on average more likely to name women than men as supporters.

The gendered division of labor is also most clearly evident in terms of assistance in the event of illness. Both male and female respondents cited women as sources of social support many times more often than men. They are equally important supporters in cases of depression and for advice on important life changes and problems with partners (Diewald, 1991). Nestmann and Schmerl (1992) also mention women more often as helpers. According to the authors, both men and women receive more help from female helpers than from male helpers (mother mentioned more often than father, daughter before son, sister before brother). Women, and especially mothers, are therefore regarded as the central support bodies for their families (Nestmann & Schmerl, 1992). Barker et al. (1990) found that men relied significantly more on their partners for support in stressful situations. The fact that men are dependent on their partners is also particularly pronounced among men above the age of 60 (Diewald, 1991).

Not only do women act as supporters for their partners, but according to Schmid’s study overview (2014), they also provide more frequent and more time-consuming support than fathers for their adult children. If they are particularly helpful in the household and with childcare, fathers are more likely to support their adult children with shopping, repairs, or gardening. With regard to intergenerational relationships, gender differences should also be noted in the support provided to children. For example, daughters have more frequent contact with their parents than sons. Daughters in many countries more often take on physically demanding and time-consuming care tasks and provide more support overall. Sons mainly help their parents with administrative tasks, repairs, or financial issues. However,

according to Schmid (2014, p. 17), little attention has so far been paid to these differences in generational research, which is why the causes of gender-specific support patterns are still insufficiently researched.

Networking and support studies on the living environments of transpeople are hard to find. However, Pflum et al. (2015) provide an example of a significant connection between social support and mental health for transpeople: For both trans male spectrum (TMS) and trans female spectrum (TFS) participants, general social support is significantly negatively associated with symptoms of anxiety and depression—with increased social support, feelings of anxiety and depressive moods decreased. However, the negative correlation between trans-community attachment and mental health symptoms was significant for TFS participants.

2.4.2 Social Relations of Men and Women in Organizations

In addition to the general research on social capital and social support networks, there is research on the difference in the “utilization” of social relations between men and women in organizations, such as business enterprises or universities. It is assumed that professional “success” is not only dependent on competencies but also on networks. Women in particular seem to be disadvantaged by processes of stereotyping (Oehlendieck, 2003; Lyness & Thompson, 2000). Most of this research shows that men have larger work-related networks, are associated with larger clusters, and derive more benefit from these relationships since men occupy higher positions in hierarchical structures (McGuire, 2000).

In contrast, women appear to be embedded in smaller and less diverse networks that provide hardly any resources. These networks have a female homophily and are mainly staffed by people from lower hierarchical positions. Since the sub-clusters also tend to be more homogeneous, there is overlapping of resources, which can lead to social capital disadvantage and replication of positions within the network (Lin, 2000). In contrast, Scheidegger and Osterloh (2004) conclude that it is predominantly men (as persons with strong legitimacy) who draw career advantages from structural holes, and that women tend to need cohesive, redundant networks to move up within the organization. At the same time, as long as only a few female persons are represented in central, statutorily higher positions, women are dependent on network contacts with higher-ranking men for economic reasons and therefore have to differentiate their network contacts with corresponding resource costs. In a study overview, they also show the strong homophily of the respective networks (female managers, female employees of media companies), whereby it was particularly true for men that their networks consisted primarily of “same sex ties.” It is therefore assumed that women tend to focus on their individual competencies rather than social capital (Poole & Bornholt, 1998), while men focus more on networks and make better use of resources (van Emmerik, 2006).

3 Gender, Social Networks, and Health Inequalities

3.1 *The Impact of Social Capital and Social Support on Health Inequalities*

The importance of gender in research on health inequalities has been repeatedly emphasized in recent years. It is usually centrally linked to the concept of social capital or social support (see the chapters “[Social Relations, Social Capital, and Social Networks: A Conceptual Classification](#)” and “[Social Network Mechanisms](#)”). The concept of social networks, if it occurs at all, is used as a metaphor for supportive or “supportive” relationships.

There is ample evidence that this social capital and the availability of social support is unequally distributed between men and women and that the impact is also gender-specific. This has already been partly discussed in the previous chapter (see above). On the basis of several studies, Underwood (2005) assumes that women generally receive more support than men when they are ill (bypass surgery, myocardial infarction). They often receive more emotional, but not necessarily material, support over a longer period of time (Hobfoll & Vaux, 1993; Underwood, 2005). In contrast, the effect is evaluated differently. For example, a Finnish study found that leisure participation and interpersonal trust predicted all-cause mortality and also cardiovascular mortality for women (Hyypä et al., 2007). A U.S. study shows that for men, participation in religious service and social group activities was protective against all-cause mortality (Eng et al., 2002). The results show, even after controlling for socioeconomic status, age, health status, and health behavior, that for women a higher level of social capital was associated with a lower risk of *all-cause mortality*. Another theoretically very significant finding of the study is the positive correlation between the frequency of contact with friends and a lower risk of all-cause mortality. Kawachi and Berkman (2001) also point to negative effects of social capital. According to them, women are mentally more burdened by their social commitment and show corresponding symptoms of illness when people with whom they are connected get (health) problems. Sarason et al. (1997) and Antonucci et al. (1998) subsequently report that women are more involved in social relationships and are more likely to experience stress and negative effects on general life satisfaction, especially if they have larger networks and maintain many close relationships. According to Walen and Lachman (2000), this may be because women who are more involved in social relationships are also more likely to experience negative events in their social environment (e.g., supporting a friend when she loses a loved one). They are more likely to perceive and respond to the needs of others and act as supporters in crises (Hobfoll & Vaux, 1993; Nestmann & Schmerl, 1992). In general, the well-being of the women interviewed is more closely related to positive and negative aspects of marriage and friendship relationships than that of men (Antonucci et al., 2001).

Another study looked at professional support and birth attend decisions. An effective strategy to reduce maternal mortality is for every woman to be supported

by a skilled birth attendant (SBA). The study of Edmonds et al. (2012) analyzed the association of women's social networks with the use of SBA in uncomplicated pregnancy and childbirth in Matlab, Bangladesh. "*The findings demonstrate that place of birth decisions can be explained from network content, though not structure, and that network content has more explanatory value than individual attributes alone [. . .]*" (Edmonds et al., 2012, p. 456).

3.2 Networks and Gender Differences Regarding Health

Beyond this research on social capital, some studies focus on a decided network perspective where gender differences play an important or central role. These often concentrate on certain phases of life, in particular on the youth phase, which has already been comparatively well researched in terms of network analysis (see chapter "[Social Networks and Health Inequalities in Young and Middle Adulthood](#)") and on the phase of old age (see also chapter "[Social Networks and Health Inequalities in Old Age](#)"). In the following, some more recent findings from these research areas will be presented.

An important issue in adolescence is risk behavior, such as tobacco or alcohol consumption. Here, both cross-sectional and longitudinal studies that shed light on gender differences and focus primarily on networks in school classes, can be found. Here, network research can show that specific network characteristics, such as homophily, ensure that specific health behavior and interventions to improve health behavior can spread more or less well (Valente, 2012).

For example, Grard et al. (2018) conducted a cross-sectional study examining gender differences in cigarette, alcohol, and cannabis use among 14–16-year-old boys and girls in 50 European schools. They show that girls have a lower prevalence of substance use than boys. The gender of the friends also plays a role: If girls have more *friendships of the opposite sex* in their networks (*other sex friendships*, OSF), they are more likely to use one of the three substances surveyed than girls who are friends more so with girls (*same-sex friendships*, SSF). Boys in OSF are more likely to smoke than boys in SSF. However, boys are more likely to consume these substances when using alcohol and cannabis. The gender composition at school is also important: in schools dominated by men, the risk of substance use is higher for boys and girls.

In contrast, Deutsch et al. (2014), in their analysis based on data from the National Longitudinal Study of Adolescent Health (Add Health) from the USA 1 year later, find no influence of the gender composition of friendship networks on drinking behavior. Thus, although the authors' hypothesis that the average alcohol consumption in the peer network has an influence on the alcohol consumption of ego is confirmed, this is not moderated by *gender*. The authors suspect selection effects here: Girls look for *peers* who show similar drinking behavior as themselves. No influence on the alcohol consumption of ego could be proven for the gender ratio in a *peer group*, either: Contrary to the assumption, higher proportions of male

adolescents in the network did not lead to higher alcohol consumption, neither among boys nor among girls. Surprisingly, the closeness of the relationships proved to be relevant to alcohol consumption: In both boys (SSF) and girls (OSF), less friendly closeness to male friends was accompanied by a stronger influence of these friends on alcohol consumption 1 year later. However, the proximity to female friends became significant only for boys (OSF) in this way. The authors conclude from their findings that the role of gender in socialization with alcohol is much more complex than previously thought and call for the study of a wide range of relationships within a network, including those that are less close or non-reciprocal. In addition, the contexts in which young people drink and their motives for drinking should be investigated more closely.

The effect of selection or influencing factors, that is, the extent to which young people choose their peers according to their preferences and needs or are influenced by them in their behavior, is investigated in studies using longitudinal data. In many cases, the so-called SIENA models (*Simulation Investigation for Empirical Network Analysis*) are used for this purpose. The research mainly focuses on the aspects of alcohol, cigarette, and cannabis consumption among schoolchildren (Knecht et al., 2011; Osgood et al., 2013; Pearson et al., 2006). With regard to smoking behavior, Finnish secondary school students are more likely to be selection factors that determine friendly relationships. With regard to alcohol behavior, there are both selection factors and influencing factors. The results did not consistently differ with regard to gender (Kiuru et al., 2010). Daw et al. (2015) also show that boys and girls in the USA (seventh grade) select their same-sex friends according to similarity in smoking behavior. An influence of girlfriends on smoking behavior could only be proven for girls. Regarding alcohol consumption, Burk et al. (2012) found that the similarity between the drinking behavior of girlfriends starts in the sixth grade, peaks in the eighth grade, and decreases again during late adolescence. Adolescents in all three age groups chose peers with similar drinking behavior, with the effects being strongest among early adolescent men and late adolescent women. There is no difference between the sexes in terms of influence (Burk et al., 2012). Regarding marijuana use in high schools in the USA, the authors note that the circle of friends is also selected according to age and marijuana use. The factor influence was only found at one high school. However, gender, race, or the number of female friends outside of school did not significantly predict the frequency of marijuana use. There was also minimal evidence that peer effects are moderated by personal, school, or family risk factors (de la Haye et al., 2013).

Network studies on gender differences and depressive disorders can also be found for adolescence. Similar to the study by Rosenquist et al. (2011) among adults, which concludes that depression is socially contagious, especially for women, Conway et al. (2011) show for adolescence that in girls the occurrence of depression among friends is accompanied by an increased occurrence of their own depressive symptoms 1 year later.

Further studies examine very specific network parameters and can show that the same network parameters for girls and boys are related to depressive disorders in completely different ways. Boys are more likely to suffer from depressive disorders

if they are afraid of negative evaluations by their peers and have a lower popularity in their network. Girls who are afraid of negative reviews are more likely to suffer from depressive disorders if they have a high popularity in their networks (Kornienko & Santos, 2014). A study by Falci and McNeely (2009) examines the size and density of networks and shows that girls who are involved in very large, fragmented networks (i.e., few network members know each other) are more likely to experience depressive symptoms than girls who are involved in large but cohesive networks. For boys, on the other hand, the situation is exactly the opposite: If they are embedded in large and less cohesive networks, they are less affected by depressive symptoms than boys who are embedded in large and cohesive networks.

Network studies can also be found in the old age phase. A study on older people (over 60 years of age) in the USA examines the effects of different ideal-type networks (diverse network, network with high social commitment, network with low social commitment and restricted network) on well-being. Men who are involved in restricted networks show a particularly low level of well-being. In general, women, in different types of networks, rate their health much better than men (Fiori et al., 2006).

An important health-related topic in old age is also the biographical transition of widowhood. The death of the partner can have a negative influence on mental health and lead to depressive symptoms. The network mechanisms of social support, social engagement, and social integration are mentioned in this context as factors that alleviate the above-mentioned symptoms and have a positive influence on health (see chapter “[Social Networks and Health Inequalities in Old Age](#)”). There is some evidence of relevant gender differences in this context (see Monserud & Wong, 2015): Older men are more likely to rely on their wives for emotional support, housekeeping, and social contacts (Lee et al., 2001; Umberson et al., 1992), and women are more likely to be economically dependent on their husbands and may therefore be exposed to financial stress when widowed (Arber, 2004; Umberson et al., 1992). Moreover, only among older women is social support perceived as low, and only among older men is there a lower level of network integration related to poorer self-reported health (Caetano et al., 2013). This could result in different demands on the social relationship networks, which they cannot always fulfill.

For Mexico, a country where institutional support systems are less developed and private, family support structures are therefore more important. Monserud and Wong (2015) find in a longitudinal study that married men reported fewer depressive symptoms than all other status groups differentiated by gender (married/already widowed in wave 1/widowed in wave 2). However, there were no statistically significant gender differences in depressive symptoms among those recently (since wave 2) widowed. The results on the influence of social support are inconsistent and the effects must be considered in a differentiated manner: Regardless of marital status, a higher score for emotional support is associated with lower increases in depressive symptoms, while receiving financial or practical support—more pronounced in recently widowed men than in recently widowed women—is associated with a greater increase in these symptoms. This could be related to the fact that reliance on this form of support may trigger feelings of dependency or be associated with the perception of

limited autonomy and a reversal of roles in parent–child relationships and thus cause stress (see chapter “[Negative Ties and Inequalities in Health](#)”). A stronger integration into a social network, operationalized through co-residence with children, relatives, or friends and participation in community activities, has the same effects, which have to be considered in a differentiated way: Generally, co-residence with relatives is associated with a higher increase in depressive symptoms, while co-residence with others (children, friends) means a lower increase in depressive symptoms. For recently widowed men and women who have been widowed for a longer period of time, co-residence with children is associated with a lower increase in depressive symptoms, while for recently widowed men co-residence with other people is associated with a higher increase. Social integration in community activities generally does not explain the change in depressive symptoms between the two waves. For recently widowed women, church attendance is associated with a higher increase, while voluntary work in community activities is associated with a lower increase for long widowed women. There is strong evidence that social support and social integration are of different importance for the sexes and that role models and unequal distribution of household and partnership tasks play a role in this. According to the theory of social capital, social networks are also a vehicle for social resources for older transpeople, which can be beneficial for successful aging and well-being: “*Controlling for background characteristics, network size was positively associated with being female, transgender identity, employment, higher income, having a partner or a child, identity disclosure to a neighbor, engagement in religious activities, and service use. Controlling in addition for network size, network diversity was positively associated with younger age, being female, transgender identity, identity disclosure to a friend, religious activity, and service use*” (Erosheva et al., 2016, p. 98).

4 Conclusion

In summary, compared to the other categories presented in this book, the category of gender is relatively well studied. Nevertheless, the concept of the network is often used as a metaphor rather than a method or theory. The focus is mainly on school class studies and older people.

Studies indicate that women live longer than men. There are also health differences between the sexes in terms of morbidity. Especially in adolescence, boys perform worse than girls in most health-related indicators (e.g., leukemia, epilepsy, chronic diseases). During puberty, girls seem to be more likely to suffer from psychosomatic and physiological complaints. From this point on, the female disease profile is more likely to be characterized by chronic diseases and psychosomatic and psychological impairments (e.g., thyroid diseases, depression, eating disorders), while the male disease profile will likely be characterized by acute and life-threatening diseases (e.g., HIV infection, malignant neoplasms of the digestive organs and the lungs and bronchi). In old age, there is hardly any general gender difference. With regard to risk behavior, research shows that men smoke more and consume more alcohol than

women. While men make less use of psychiatric, psychotherapeutic, and outpatient medical services up to adulthood, the situation is similar in old age. However, research shows that it is important to take an intersectional perspective, because other aspects such as class do play an important role (Broom, 2008).

Network studies reveal differences between men and women. It can be argued that women have larger networks, which in turn have more family and kinship diversity. However, the latest studies assume that the networks of both sexes are slowly converging. With regard to the resources gained from social relationships, there is evidence that women are more likely to provide help in the event of illness. Mothers also provide more time-consuming support, and women seem to have more contacts for problems than men. Those preferred in receiving help, men or women, seems to be contradictory, with more studies showing a tendency toward female helpers. In professional network relationships, men have larger work-related networks. They are connected to other sub-networks and derive more benefits from these relationships since they occupy higher positions in professional networks. Women seem to focus more on their individual skills rather than social capital, while men focus more on networks and make better use of resources.

Studies on the relationship between networks and social capital or social support against the background of health inequalities show an unequal distribution. Women seem to take on more and more time-consuming social support tasks. They have more contact persons for problems than men. They also seem to suffer more often from negative aspects of social relationships. Women seem to be exposed to higher health burdens than men due to their greater social involvement.

In general, the health and health behavior of pupils and elderly people are becoming the focus of network research. Among adolescents and young adults, network studies often investigate cigarette, alcohol, and cannabis consumption. In addition to cross-sectional studies, more recent longitudinal studies investigate the influencing or selection factors. They examine the extent to which young people choose their friends according to their preferences and needs or are influenced by them in their behavior. Here, however, the research situation seems rather heterogeneous, perhaps also due to the different data sets and country focus. However, it is clear that girls or young women use light drugs to a lesser extent than their male peers and that social networks have a major effect on health behavior. However, the extent to which gender differences exist in network effects remains to be researched. There is also a connection between depressive illnesses and social networks, which appears to be subject to gender-specific factors.

In old age, the focus is mainly on the phase of widowhood and the associated network effects. Networks seem to have a positive influence on health. Nevertheless, negative aspects of networks are also apparent and can differ according to gender. For example, men are more likely to lose emotional support and parts of their social contacts due to the death of their partners, while women may be exposed to financial stress due to their economic dependence on their spouses.

The very few studies on transpeople show that many of them live on the margins of society and face stigmatization, discrimination, exclusion, violence, and poor health (Winter et al., 2016).

In conclusion, we would like to briefly discuss the desiderata. Despite a number of scientific studies, many questions are still unanswered. We would like to point out that intersex persons⁶ are (almost) never considered in the studies. Furthermore, network research has so far played a subordinate role in the analysis for the benefit of social support or social capital. But concrete questions are also hardly ever considered. While the influence of networks on risk behavior has already been very well researched, the question arises as to what positive aspects social networks have on health behavior, such as doing sports or giving up certain drugs. In the explanation patterns regarding illness and the course of diseases, the question of the effects of class, gender, and social network connections should be given more attention, not only with newer methods of quantitative but also qualitative network research. It would also be important to link the concept of intersectionality even better with network research.

Reading Recommendations

Broom, D. (2008). Gender in/and/of health inequalities. *Australian Journal of Social Issues*, 43(1), 11–28. This article discusses the aspect of gender and intersectionality by using empirical examples.

Barry, A.-M. & Yuill, C. (2012). *Understanding the sociology of health: An introduction, Third edition*. Sage. The section on Gender and Health (pp. 129–144) offers readers a clear introduction to the relationship between health and gender based on international data.

Bradford, J., Reisner, S. L., Honnold J. A., & Xavier, J. (2013). Lesbian, gay, bisexual, and transgender health: Findings and concerns. *Journal of the Gay and Lesbian Medical Association*, 4(3), 102–151. A dense, good overview article on LGBT and health.

Moore, G. (1990). Structural determinants of men's and women's personal networks. *American Sociological Review*, 55(5), 726–735. An older but exemplary representative study from the U.S., which works with quantitative data from the General Social Survey (GSS, 1985) on strong relationships.

Schwartz, E., & Litwin, H. (2018). Social network changes among older Europeans: The role of gender. *European Journal of Ageing*, 15(4), 359–367. A recent quantitative longitudinal study that uses the Survey of Health, Ageing, and Retirement in Europe (n = 13,938) to investigate gender differences in the social networks of older people (65+).

⁶People whose physical characteristics cannot be assigned to the female or male gender norm.

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Social Networks and Disability: Access to and Stabilization of Integration into the Primary Labor Market



Stefan Zapfel, Nancy Reims, and Mathilde Niehaus

Overview

- Network theories have largely been neglected in labor market-related research on disability and rehabilitation. Their explanatory potential has therefore not yet been fully exploited.
- Nevertheless, disabilities are closely linked with the genesis and stability of networks, which in turn impact access to and continuity of employment.
- Welfare-state regulations and institutions (e.g., representatives for people with severe disabilities, workplace integration management, the International and Specialized Placement Service of the Federal Employment Agency, vocational rehabilitation institutions) help people with disabilities to (re)establish or expand social and organizational network contacts and to enter or remain in employment.
- The extent to which labor market integration is successful largely depends on the accessibility of such assistance, the commitment of welfare-state actors, forms of cooperation, the motivation of individuals with disabilities to participate as well as their individual educational backgrounds, and social support.

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1 Introduction

Social science research and official statistics repeatedly point to the poor employment prospects of people with disabilities compared to those without disabilities (Eichhorst et al., 2010, p. 7; WHO, 2011, p. 237; Engels et al., 2017, p. 166 ff.; von Kardorff et al., 2013, p. 7 ff.; Pfaff, 2012, p. 235 ff.; Rauch, 2005, p. 28 ff.). People with disabilities are therefore also less likely to benefit from the manifest and latent functions of employment (Jahoda, 1983). The manifest functions include financial resources and access to the social security system. The latent functions encompass, for example, predefined time structures, the existence of common goals, social and professional prestige, the possibility to perform an activity experienced as meaningful, and the establishment and maintenance of social contacts. Deficits in access to the latent functions of employment are one of the main factors that explain the generally poorer health status of the unemployed (Batinic et al., 2010; Jahoda, 1982).

In view of the difficult employment situation of people with disabilities, there are a variety of active labor market programs in Germany that aim to improve, maintain, or stabilize the employment situation of this group. In addition to general services provided by the unemployment insurance, such as career advice or job placement, which are also available to people without disabilities (Schrüder et al., 2009, p. 13; Reims, 2020), Germany also has a mandatory employment quota requiring firms with more than 20 employees to fill 5% of their jobs with people with disabilities (SGB¹ IX), extended job protection for people with disabilities (SGB IX), integration subsidies that can be granted to employers hiring people with disabilities (SGB III), participation assistance (SGB IX), the provision of work assistance (SGB IX), supported employment (SGB IX), trial employment (SGB III), workplace integration management (SGB IX), and educational programs of vocational rehabilitation (Weber & Weber, 2015, p. 265 ff.). The latter are differentiated according to whether they target especially young people entering the labor market (initial integration) (Tophoven et al., 2019) or people with disabilities with prior experience of working life (re-integration) (Reims, 2020).

Some of these instruments are only available to individuals with a disability according to § 2 SGB IX (2020), which is the definition that also serves as the basis for this article and states that people are considered disabled if they “[...] have a physical, psychological, intellectual or sensory impairment that, in interaction with attitudinal and environmental barriers, is highly likely to impair their equal participation in society for longer than six months.” Other benefits require an officially recognized severe disability (or an equivalent legal status) (SGB IX), although the official degree of disability has only limited significance for the extent to which social participation is restricted (Benitez-Silva et al., 2004; Rohrmann, 2012, p. 475).

In addition to creating inactivity traps (Famira-Mühlberger et al., 2015, p. 18), the provision of welfare-state services can boost resistance to illness, which is generally more severely impaired among the unemployed, and help those already suffering

¹SGB corresponds to the German Social Code and the relevant book (I–XII) that is referred to.

from disability or illness to develop appropriate coping strategies (Potts, 2005) and facilitating their access to employment (Granovetter, 1973). Social networks of individuals, groups, and institutions (Borgatti et al., 2018, p. 2) can have similar effects, but despite their importance for health, education, and employment, they are still rarely considered in disability-related health and rehabilitation research. This also applies to the methods and theories of network research (von Kardorff, 2010).

The aim of this paper is to reduce this research gap by identifying starting points, both in theoretical and empirical terms, for applying network and social-capital approaches in the field of the labor market integration of people with disabilities and to critically expose research deficits in this field. The paper focuses on formal, informal, and institutional networks of relationships, the support capacities resulting from them, and possible changes in networks due to the onset of disability. It thereby also takes into account organization-based networks of welfare state agencies that work together to achieve rehabilitation goals (see, e.g., Morrissey et al., 1997). The article also deals with effects that network changes have on the employment situation and employment opportunities. Not addressed, on the other hand, are network approaches that consider multiple diseases or types of disability themselves as a network and subject them to investigation (as, for instance, did Nuijten et al., 2016).

2 Disability and Labor Market Integration

For Germany, the comparatively unfavorable educational and employment prospects of people with disabilities have been documented many times (Eichhorst et al., 2010; WHO, 2011, p. 237; Engels et al., 2017; Pfaff, 2012; Rauch, 2005). People with disabilities in Germany usually achieve a lower level of education than people without a disability. This is especially true for those who are segregated into special schools at an early age, where it is often not even possible to gain a lower secondary school leaving certificate (Klemm, 2015). Young people at special schools therefore often leave their educational institution without a lower secondary school leaving certificate, which reduces their chances of entering vocational training (Pfahl & Powell, 2011). If they are nevertheless given access to the training system, they generally take part in (further) training in special vocational fields with little involvement in companies (Tophoven et al., 2019). In combination with a number of other especially stigma-related factors, such as employers' reservations about hiring, as well as their fear of reduced performance, frequent periods of absence, more difficult dismissal, and mobility restrictions (e.g., Niehaus & Bauer, 2013, p. 12 f.; von Kardorff et al., 2013, p. 37; Rauch, 2005, p. 32; Wansing & Westphal, 2014, p. 41), this educational path reduces the employment prospects of people with disabilities. This is reflected in longer periods of unemployment, lower wages, jobs that are below the level of qualification achieved (Weller, 2017), and in lower employment rates and higher unemployment rates than those of people without disabilities, even in phases of economic upswing (Bundesagentur für Arbeit, 2018; Niehaus & Bauer, 2013, p. 32).

Various labor market policies aim to combat and compensate for disadvantages of people with disabilities on the labor market. These include the aforementioned active labor market programs, which are designed to create or stabilize relationships between employers and people with disabilities. Hence, these programs are also relevant to the network context. Of the instruments aimed specifically at people with disabilities trial employment and vocational rehabilitation services essentially have a relationship-generating function. Extended protection against dismissal and workplace integration management primarily exhibit a relationship-stabilizing function. Workplace adaptations, the provision of work assistance, and supported employment promote both areas by facilitating employment and the continuation of employment relationships.

3 Social Networks of People with Disabilities

Various studies, including the participation report published by the federal government on the living situations of people with disabilities in Germany, show that people with disabilities often have fewer social contacts than other groups (Engels et al., 2017; Forrester-Jones et al., 2006; Morgan et al., 1984; Pfaff, 2012, p. 234; Schröttle et al., 2014, p. 24). They have smaller networks and are less likely to begin new relationships in everyday life (Forrester-Jones et al., 2006; Schröttle et al., 2014). Furthermore, the onset of a disability can be accompanied by a loss of relationships and networks (von Kardorff, 2010). On the one hand, it can lead to a situation in which the individual with disability is no longer able to perform their job and is nearly unemployable (Lang, 2003, p. 181). On the other hand, the onset of a disability can have an eroding effect on everyday relationships, especially since it may also result in new burdens for the immediate social circle. The assistance required may in some cases exceed the support capacities available in the private sphere (von Kardorff, 2010). Evidence from international research points in the same direction. It shows, that a “[. . .] deteriorating health status can diminish the quality of social relations [. . .]. Higher quality relations become more difficult to achieve” (Dickson-Markman & Shern, 1985, p. 60). Relationships that are already looser and emotionally less supportive are particularly endangered. At the same time, it can be more difficult to establish new contacts due to barriers or stigmatization (Pfaff, 2012; Schröttle et al., 2013, p. 24), which leads to an increasing risk of social isolation (Morgan et al., 1984, p. 495) and simultaneously decreasing chances of access to professional support services (von Kardorff, 2010). This is a risk in particular for women with severe disabilities² (Niehaus, 1993; Niehaus & Bauer, 2013).

²In disability-related research into inclusion and participation, cumulative disadvantages associated with different social characteristics are dealt with intensively under the term *intersectionality*. This refers to an exclusionary effect resulting from the negative evaluation of several personal characteristics such as gender, disability, or ethnicity (Crenshaw, 1989; WHO, 2011, p. 3; Weinbach, 2014).

However, disabilities do not always lead to a breakdown of everyday relationships. Frequently, there is simply a shift in the relationships, though this can have serious impacts, too. Such transformations range from shifts in the division of labor within the family and the reorganization of routines and schedules for coping with everyday life through new social requirements regarding mobility and affectivity to extensive financial needs (von Kardorff, 2010). Network shrinkage may also be accompanied by an increase in the density of the remaining network, as is shown by empirical studies on cognitively impaired and severely disabled people (Forrester-Jones et al., 2006).

All this indicates that networks of people with disabilities differ considerably in terms of type and quality and sometimes have a specific character (Engels et al., 2017). Differences exist, for example, in the degree of institutionalization (informal or formal), social location (e.g., living or working environment), the context of origin (e.g., before or after the onset of a disability or the purpose of the network), function (emotional, instrumental, information-related), or particular support capacities (Chronister et al., 2008).

Informal networks usually provide informal assistance. They may result in less need for professional help or a better access to welfare state support (Kogstad et al., 2013, p. 95). But not every relationship is necessarily helpful and supportive (Dickson-Markman & Shern, 1985, p. 50), and there are cases, particularly in mental health care, where access to welfare state organizations mediated through social relationships can be ambivalent, such as when involuntary admissions are involved (Pescolido et al., 1998, p. 276). On the whole, however, the research is predominantly about improvements in access and care in a positive sense.

Informal networks emerge in a variety of contexts. On the one hand, they result from the fact that they are embedded in families and circles of friends and acquaintances, largely located outside of the employment context. On the other hand, informal relationships also emerge from the employment system and generate social ties to superiors, subordinates, and colleagues with varying intensity (Knox & Parmenter, 1993). These relationships can be part of a hierarchical structure between employees and their immediate superiors, or a horizontal structure characterized by social relationships between employees (Badura, 2008). Social support resources emerge from both areas, which can also facilitate integration into the labor market and create opportunities for social participation (Granovetter, 1995, p. 48). However, an increased need for support in connection with disabilities can cause new (informal) dependencies that run contrary to the promise of self-determination for people with disabilities, as expressed in the UN Convention on the Rights of Persons with Disabilities, the Act on Equal Opportunities for Persons with Disabilities (Behindertengleichstellungsgesetz), or the Federal Participation Act (Bundesteilhabegesetz) (cf. e.g. Kastl, 2017, p. 229; Lewicki, 2014, p.12; Welti, 2005, p. 23 ff., Federal Ministry of Labor and Social Affairs [BMAS], 2011, p. 53; Schröttle et al., 2013, p. 75).

In addition to informal relationships, formal, sometimes legally prescribed and regulated relationships with employers or within a company (e.g., through the workplace integration management or the representative for people with severe

disabilities) are also essential for accessing and maintaining employment relationships. The same applies to associations and other bodies representing the interests of people with disabilities or vocational rehabilitation institutions (Federal Employment Agency in Germany, pension insurance, vocational training institutes, etc.) that aim to create, strengthen, or secure employment opportunities for people with disabilities. Unlike in everyday contexts, the onset of a disability is not an occurrence that increases the risk of losing relationships. On the contrary, it is the decisive factor in establishing contacts with such institutions and groups that provide assistance (cf. Borgatti et al., 2018, p. 4).

One of the normative prerequisites laid down in Germany regarding both informal and formal support for people with disabilities wishing to take up or maintain their employment relationships is that the clients' wishes and demands are taken into account and authoritarian dependencies are avoided (Chronister et al., 2008).

4 The Role of Social Networks in the Labor Market Integration of People with Disabilities

Social relationships and networks are important for integration into the labor market, both informally and institutionally (Brucker, 2015). This also applies to people with disabilities. Access and use vary considerably, however. The extent to which they influence the integration of people with disabilities into the labor market and the role they play in social and labor market policy are explained below.

4.1 Informal Relationships to Promote Participation in Working Life

Labor market research has repeatedly pointed out the importance of general and professional relationships and networks for access to employment and careers (Granovetter, 1973, p. 1371 et ff., 1995, p. 4 et ff.). The "imperfection" of labor markets is usually referred to in this context (e.g., Lin, 2009, p. 20), stressing that, contrary to the assumptions made in neoclassical labor market theory, neither employers nor (potential) employees possess all the relevant information needed to find a job or applicant (Hinz & Abraham, 2008, p. et 51 ff.). In this context, networks take on the function of informally reducing such information deficits. However, since the networks differ regarding access and quality, the possibilities are unequally distributed. Employment opportunities and career prospects are all the better the larger and more heterogeneous the networks are, for example, regarding occupational affiliations or social status (Diewald & Sattler, 2010; Granovetter, 1995, p. 12 et ff.). As the network size increases and the composition becomes more diverse, the variety of information grows, but at the same time the number of weak social ties in

the network also rises. Weak ties boost the value of information related to the labor market, whereas strong ties foster support possibilities for coping with everyday life (Potts, 2005).

Health, employment, disability, social participation, and the availability of and integration into networks are closely related (Niehaus, 1993). Since people with disabilities generally have smaller but denser networks to which new contacts are added less frequently than in other groups, the existing relationships of people with disabilities provide fewer opportunities for (re)integration into the employment system. In addition, if a disability occurs during a person's life-course and they lose their job, existing contacts to working life, and thus important sources of information and support that could facilitate re-entry into the labor market, are lost. Informal relationships are therefore less helpful for people with disabilities wishing to access the labor market and pursue career paths than for non-disabled people. The situation is different for institutional relationships and networks.

4.2 Institutional Relationships to Promote Participation in Working Life

There is a wide range of institutional networks and relationships by and for people with disabilities, some of which were established in Germany with the aim of helping people with disabilities to integrate into the labor market. Others were created for non-work purposes, but nevertheless assist people with disabilities to access working life or to stabilize their existing employment relationships. In this context, interest groups and associations of people with disabilities, welfare-state provisions concerning the integration of severely disabled people into the workplace (such as representative bodies for employees with severe disabilities or workplace integration management), and welfare-state institutions for vocational rehabilitation and employment services that specifically help people with disabilities to (re)enter the labor market are particularly important. The latter institutions make targeted use of professional networks to implement appropriate programs and measures for labor market integration. For their part, they form a structure in which several organizations work together and in this way support the inclusion process (Morrissey et al., 1985). In addition to interorganizational cooperation, the coordination of cooperation is also important there, which becomes particularly relevant in the case of fragmented responsibilities (Morrissey et al., 1997, p. 5), as is the case in the German rehabilitation system (Brussig et al., 2021, p. 25).

4.2.1 Interest Groups and Associations

Disability organizations are central actors involved in representing the interests of people with disabilities and provide support regarding everyday life and lifestyle in

various ways. They do not specifically aim to integrate people with disabilities into the labor market but help their members to find employment by means of advisory services and the dissemination of job advertisements, for example, via newsletters.

In addition to these organizations, there are various self-help groups for certain types of disability and illness, which differ considerably in their degree of organization. In Germany, the “BAG Selbsthilfe” is an umbrella organization comprising 113 self-help organizations for disabled and chronically sick people and their relatives. As a nationwide, free association it represents the interests of all disabled and chronically sick people, independently of party-political or religious ties. The networks of and for women with disabilities were also founded under this institutional umbrella in the 1990s with the aim of highlighting the specific concerns of girls and women with disabilities (Niehaus, 2001). Their activities and demands were incorporated, for example, into the legislation of Book IX of the Social Code, thereby supporting their members not only individually but also politically by influencing federal and state legislation.

In order to assert the political interests of people with disabilities, disability organizations in Germany strive to achieve consensus and compromise. To this end, they form alliances with trade unions and associations in the independent welfare sector seeking to improve their opportunities to assert themselves (Hammerschmidt, 1992). The fields of activity vary and address education as well as political participation, social security issues, and employment (Engels et al., 2017).

However, disability organizations are selective in two ways (Bengtsson & Datta Gupta, 2017). On the one hand, they often focus on specific groups of people with disabilities and chronic sicknesses. On the other hand, more highly educated people with disabilities primarily organize themselves in these organizations and gain access to information and assistance. Although the disability organizations are important for the development of social policy and access to employment in the Federal Republic of Germany, their reach should not be overestimated.

4.2.2 Representative Body for Severely Disabled Employees (SBV)

In private-sector companies and public-sector administrations in Germany, representative bodies for severely disabled employees are elected to represent the interests of employees who have a severe disability or equivalent status. These representative bodies form an integral part of the formal relationship structure in companies. They have an influence on the continuity of the employment of people with disabilities in companies and their social integration in these organizations. The basic principles of the work involved in representing severely disabled employees are laid down in Book IX of the Social Code and stipulate specific rights and duties in the company. The representative bodies are also responsible for supporting employees who are not severely disabled but who are at risk of disability, such as those who are chronically sick.

With their expertise concerning the workplace participation of people with disabilities or chronic sickness, the representative bodies support the works council and the employer in matters of (re)integration. Due to their extensive knowledge of social law, their provision of trustworthy contacts, assumption of coordinating mediation tasks, and proactive initiation of occupational health measures, these representative bodies act as guides in questions of occupational inclusion and preventive measures (Kohl & Niehaus, 2014). Informally, they help to reduce any reservations employers may have about hiring people with disabilities (fears of reduced performance as well as limited mobility and flexibility, etc.).

The representative body also promotes the relationship of trust between the various players in the company (disabled and chronically sick people, works council, employer, company doctor) by means of personal advice and proximity to the workforce (Deutsche Gesetzliche Unfallversicherung e.V., 2014). Networking, cooperation, and trust between the above-mentioned actors and with the responsible social insurance institutions are central prerequisites for an effective implementation of workplace integration management and successful participation in the company (Niehaus & Vater, 2014). The representatives for severely disabled employees are thus important network partners at the interface between the employees with disabilities, company bodies (e.g., works council), employer representatives, and external actors, for example, social insurance institutions, such as pension or health insurance funds.

By signing the UN Convention on the Rights of Persons with Disabilities and its ratification in 2008, Germany committed itself to ensuring the full and effective participation of people with disabilities in all areas of society. The vision of an inclusive labor market, as defined in accordance with the Convention, also extends the tasks of the representatives for severely disabled employees. These increasingly go beyond knowledge of labor legislation to cover also cross-functional advisory tasks that require networking and knowledge management in very different areas (Kohl et al., 2015). As a consequence, the representatives face new challenges regarding prevention and inclusion resulting from large-scale social changes, such as digitalization and demographic change. The range of activities performed by the representative bodies for severely disabled employees as well as internal and external alliances that can contribute to maintaining employability and participation is at the core of the current discussion. No network analysis has been conducted on this subject so far. Such analyses could investigate how these representative bodies support people with disabilities with their integration under these new conditions and what role networks of representative bodies plays in this context.

4.2.3 Workplace Integration Management

Workplace integration management is a regulation created by the legislator that requires employers to assess how an employee's incapacity to work can be overcome or prevented and their job retained while ill for more than a total of 6 weeks within a year. Together with the responsible representation and, if necessary, in cooperation

with the company doctor, decisions are made as to what measures are to be taken. The rehabilitation providers and, where applicable, the integration office can also be involved in the process. The employees' participation is voluntary.

Small and medium-sized enterprises implement workplace integration management less frequently than larger companies due to a lack of resources and alternative jobs (Niehaus et al., 2021). There are no representative research findings on regional differences in application, standards in workplace integration management, and the role of networks in access to the Scheme.

4.2.4 International and Specialized Placement Service and Peer Counseling

The International and Specialized Placement Service of the Federal Employment Agency (ZAV) supports both academics with severe disabilities in their search for employment that matches their qualifications as well as employers wishing to hire severely disabled university graduates (Deutsches Studentenwerk, 2013, p. 201). As an organization set up for this purpose, it performs an important function in finding employment for severely disabled graduates. It also attempts to establish contacts specifically with this group of people and between severely disabled people and employers.

Parallel to this, in matters concerning the participation of people with disabilities in working life, self-help activities are increasingly being discussed regarding the importance of peer counseling (in this case, counseling by people with disabilities for people with disabilities). Peer counseling, as a component of professional counseling services, has been proven to improve occupational participation by increasing the motivation to participate in rehabilitation and emphasizing self-determination in decision-making. In Germany, demands for more peer counseling for occupational participation are reinforced by action plans drawn up by the German *Länder* and the Statutory Accident Insurance to implement the UN Convention on the Rights of Persons with Disabilities, which already includes peer counseling as a measure (Niehaus & Saupe-Heide, 2012).

Since 2018, peer counseling has been of particular importance in the Federal Participation Act as a supplementary independent advisory service concerning participation. The legislation is based, among other things, on the findings obtained by the scientific expert group RehaFutur, which emphasizes that opportunities for participation in working life are improved if suitable structures are put in place to encourage people with disabilities to make active use of their self-determination and personal responsibility (Riedel et al., 2009). Whether peer counseling, as a qualitative feature of network structures for people with disabilities, provides better opportunities for action than counseling by non-disabled persons or an absence of such counseling is a potential topic for future research.

4.2.5 Rehabilitation-Specific Institutions

Another type of social network for people with disabilities is rehabilitation-specific and stems from institutional and professionalized forms of support designed to facilitate or consolidate the reintegration of people with disabilities into the labor market. In this context (similar to the case of the ZAV), formal relationships are purposely established between people with disabilities, on the one hand, and rehabilitation counseling, job placement services, case management, and potential employers, on the other hand, in accordance with social law and administrative guidelines. The rehabilitation providers (Federal Employment Agency, pension insurance, statutory accident insurance, etc.), providers of integration assistance, and rehabilitation services create networks via (third-party) investments in social capital (Bourdieu, 2005, p. 65), which are intended to help people with disabilities get back into employment or retain their employment. The intention of the professional actors involved in this is to adopt a bridging function (Putnam, 2000, p. 411) to provide people with disabilities with network contacts relevant to labor market integration (von Kardorff, 2010).

However, access to vocational rehabilitation and related network structures is only available to those who have submitted a formal application for benefits to help with participation in working life and have also been officially recognized as people requiring rehabilitation (Reims, 2020). The service providers, funding agencies, and rehabilitants jointly plan the rehabilitation measures. The providers of vocational rehabilitation measures are flexible regarding the organization of measures and are characterized by a wide range of support and network structures. They offer various vocational training options, are specialized in certain types of disability, provide different types of additional socio-educational or medical/therapeutic services to accompany rehabilitation, often permit inpatient accommodation, and possess diverse links to companies and potential employers. The differences in the service providers' network structures can also result in varying rehabilitation outcomes. For example, smaller, centrally organized networks that are more diversified in terms of service providers appear more conducive to integration than larger, decentralized, and homogenous networks, whereas the latter constellation is more likely to guarantee continuity of care (Lorant et al., 2017).

The training phase is often followed by transitional support, which is intended to support the application process and facilitate integration into the new occupation. If the person concerned has a severe disability (or equivalent status), the integration assistance service can also be called in, which provides advice and support for both companies and people with disabilities (von Kardorff, 2010).

A broad institutional and professional network involving a variety of actors already exists in Germany. Nevertheless, there are still demands for extended networking among service providers, which is necessary in order to eliminate the persistent interface problems, improve access to the services, reduce coordination deficiencies and care costs, and improve reintegration outcomes (von Kardorff, 2010).

However, institutional networks are not the only important factor in the process of vocational rehabilitation. The rehabilitants' informal, everyday relationships are also often of importance and are taken into account when measures are planned (Chronister et al., 2008). There are two reasons for this. First, the prominent requirement in the *International Classification of Functioning, Disability and Health* (ICF) stated that the overall personal context should be taken into account when planning occupational reintegration (Escorpizo et al., 2011). Second, support from and contact to family and friends during participation in measures to assist the return to working life have a strong impact on the rehabilitation outcome, a fact that has been substantiated in numerous studies (Chronister et al., 2008; McKenna & Power, 2000; Potts, 2005). The effect can be either positive or negative, depending on whether or not social support is available (Zapfel, 2015, p. 242).

5 Conclusion

With the onset of a disability, the risk of losing informal and parts of formal networks increases, but at the same time the chance of gaining other, mainly professional network partners increases. Welfare-state regulations and institutions, such as representative bodies for severely disabled employees, workplace integration management, specialized placement services, or vocational rehabilitation institutions, give people with disabilities the opportunity to establish or expand network contacts and to regain or maintain access to the labor market. The extent to which successful integration into the employment system is possible depends on various factors: formal accessibility, the commitment of welfare-state actors and their cooperation, the willingness of employers to include employees with disabilities in their workforce, the motivation of people with disabilities to participate, their educational background, and the support they receive in their everyday life.

In labor market-related disability and rehabilitation research, the application of network approaches has largely been neglected so far. This applies both to informal modes of access to the labor market and to the role played by interest groups of people with disabilities, organizational units, and processes within firms (such as representative bodies for severely disabled employees and workplace integration management), the importance of the Specialized Placement Service of the German Federal Employment Agency, peer counseling services, and vocational rehabilitation facilities. The aim of this article was to show possible starting points for research in this field to include relevant empirical material, reveal corresponding research gaps, and make suggestions for future research activities.

Reading Recommendations

- Chronister, J., Chou, C. C., Frain, M., & da Silva Cardoso, E. (2008). The relationship between social support and rehabilitation related outcomes: A meta-analysis. *Journal of Rehabilitation*, 74(2), 16–32. <https://www.questia.com/library/journal/1G1-182034960/the-relationship-between-social-support-and-rehabilitation>. Accessed: 4 April 2018: The article addresses the role of social support regarding risks of illness and the chances of success of rehabilitation measures. It provides a detailed review of publications on this subject in the fields of psychology, social sciences, and health science.
- Lorant, V., Nazroo, J., Nicaise, P., & Title107 Study Group (2017). Optimal network for patients with severe mental illness: A social network analysis. *Administration and Policy in Mental Health*, 44(6), 877–887. This article deals with network structures in healthcare services and examines the impact of various structural characteristics of networks (for example, composition, size, centrality) regarding how they facilitate continuity of care and social integration in Belgium. The data basis is a survey conducted among 954 patients living in Belgium.
- Morgan, M., Patrick, D. L., & Charlton, J. R. (1984). Social networks and psychosocial support among disabled people. *Social Science & Medicine*, 19(5), 489–97. The article addresses the impact of network characteristics (network size and type) on access to psychosocial support in London for people with physical disabilities. It also deals with differences in networks according to degree of disability, location-specific differences in networks of people with disabilities, and the importance of family ties for the availability of emotional support.

Data Sets

In Germany, there are only a few data sets that provide information on disability and employment and are not limited to a few basic data on social contacts. Notable exceptions are “Gesundheit in Deutschland aktuell” (GEDA) and the “Representative Survey on the Participation of People with Disabilities.”

- GEDA is a representative cross-sectional survey regularly conducted by the Robert Koch Institute since 2008. In the last survey wave conducted in 2014/15, 20,000 individuals in Germany aged 15 or older were interviewed. The survey includes, among other things, questions about disability, the employment situation, the use of health services, and social contacts with different groups of people and relationships of trust. Further

(continued)

information can be found at: https://www.rki.de/DE/Content/Gesundheitsmonitoring/Studien/Geda/Geda_node.html

- The “Representative Survey on the Participation of People with Disabilities” was conducted by the Institute for Applied Social Science between 2018 and 2020, with 27,000 respondents. It includes questions on disability, employment and work experience, the use of various welfare-state facilities, and social relationships and contacts to people with and without disabilities.

Further information can be found at: <https://www.bmas.de/DE/Service/Medien/Publikationen/Forschungsberichte/Forschungsberichte-Teilhabe/fb-492-repraesentativbefragung-behinderung.html>

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Migration as a Health Inequality Dimension? Natio-Ethno-Cultural Affiliation, Health, and Social Networks



Markus Gamper  and Annett Kupfer

Overview

- Ethnic and migration-related differences are increasingly being researched as a determinant of health inequalities, but empirical results in this regard are sometimes contradictory.
- Studies on “Migration and health or health inequalities” and on “Migration and networks” are available.
- Studies that cover all three areas together are very rare and almost always only consider a population group without additionally broadening the view to vertical dimensions of inequality, such as income or education.
- Most studies use the term “network” as a metaphor or synonym for group or social capital, or they exclusively investigate social support as a central function of social networks.
- The extent to which the phenomena associated with the concept of migration are actually migration-specific—for example, linked to a concrete migration process—or whether other social group memberships, such as class or gender, have (higher) explanatory power for health inequalities, in the sense of intersectionality, remains to be studied.

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1 Introduction

Concepts like race, migration background, or ethnic group are more and more being investigated in health research. It should be noted that those concepts themselves are very heterogeneous. They are, for example, endowed with different rights (e.g., cosmopolitan migrants from the global north, refugees from the global south) (Ambrosini & van der Leun, 2015) or have to deal with racism or discrimination (Nazroo, 2003). A challenge and a recurrent difficulty in research on the health of migrants is the operationalization of studies due to the heterogeneity of the group. On the one hand, it is unclear which criteria—nationality, mother tongue, ethnicity of grandparents, race, place of birth, place of migration as well as migration regime—are used to determine “migrants,” which makes comparability of the studies difficult (Sheldon & Parker, 1992). On the other hand, the group of people with a history of migration is very heterogeneous with regard to other lines of difference, such as social milieu/class and gender, but also country of origin and reason and time of migration. This makes the health situation of the so-called migrants very different, and it cannot be described in a generalized way. Research shows that social integration and social support can play a big role in the health status of migrants. It can provide information to the healthcare system, provide emotional support, or simply make someone feel like they are not alone. Social networks also play a big role for people with a so-called migration background or with a so-called different ethnic background (Johnson et al., 2017). In this chapter, we explore the link between health, migration, and networks. In doing so, we will try to minimize the uncertainty of the heterogeneity of the group as much as possible.

2 The Health of Migrants: Study Results to Migration and Health

First, we will present research on health and migration.¹ We will show research results on the physical and mental health status of migrants as well as outcomes on subjective well-being and health behavior. The focus will be on research on physical as well as psychological factors. In addition, we give a short summary of current study results addressing COVID-19 and migration. Finally, we shortly sum up different explanation models for the health status of migrants. In several parts of this chapter, we would like to distinguish between migrants (e.g., migrant workers) and refugees.

¹We could only consider literature published in English and German. This may lead to a concentration on the global north.

2.1 *Physical and Mental Health of Migrants*

2.1.1 Mortality

Researchers studying mortality among migrants have found evidence that this “group” tends to show *lower mortality* than the non-migrant population of host countries in the global north. For example studies in Australia illustrate a lower mortality over different migrant groups (Kouris-Blazos, 2002; Anikeeva et al., 2010, 2015). The same results can be found in New Zealand (Hajat et al., 2010). Research on immigrants in the United States showed a lower risk of overall mortality than persons who were born there (Singh & Siahpush, 2001). One big focus is on the Hispanic mortality paradox. A meta-analysis of the published longitudinal literature on Hispanic populations shows that 17.5% have a lower risk of mortality compared with other ethnic groups. The results differed by age, preexisting health conditions, and racial group: Hispanics had a lower overall risk of mortality than non-Hispanic Blacks and non-Hispanic Whites, nevertheless an overall higher risk than Asian-Americans (Ruiz et al., 2013). Shiels et al. (2017) note that between 2011 and 2014, Native Americans and native peoples of Alaska had the highest premature mortality followed by black people. Newbold used the data of Canada’s longitudinal National Population Health Survey to explore the self-assessed health of Canada’s immigrant population. He focused on the health between the native-born populations and immigrants, the factors that contribute to immigrant self-assessed health, and the factors associated with declining self-assessed health status. According to Newbold (2005, p. 1359), “*Results indicate mixed support for the Healthy Immigrant Effect, with the native- and foreign-born neither more nor less likely to rank their health as fair or poor. However, results from the proportional hazards model indicated that the native-born were at lower risk to transition to poor health.*” Setia et al. (2011) emphasize that women from countries with a lower development index appear at greater risk of poor self-assessed health.

The migrants mortality paradox is also being explored in Europe (Khlat & Darmon, 2003). Research conducted by Razum et al. (1998) shows that the age-adjusted mortality rate of Turkish males and females aged 25–65 years residing in Germany was, consistently half that of the German population in 1980 and 1990 (Razum et al., 1998). Similar results are found for German immigrants from the Former Soviet Union (Ronellenfitsch et al., 2006). In contrast, a study by Kibele et al. (2008) assumes an underestimation of the mortality of migrants over 65 years using the data of the German Pension Scheme. They argue that: “*Mortality re-estimation reveals two-fold underestimation of mortality of foreigners due to biased death numerator and population denominator*” (Kibele et al., 2008, p. 389). In Belgium, the research data points to the migrant mortality paradox (Deboosere & Gadeyne, 2005; Vandenheede et al., 2015). However, according to Vanthomme and Vandenheede, “*Adjusting for socioeconomic position generally increased the migrant mortality advantage, however with large differences by gender, migrant origin, socioeconomic position indicator and causes of death*”

(Vanthomme & Vandenheede, 2019, p. 96). Similar results are also observed in the United Kingdom (Scott & Timæus, 2013; Wallace & Kulu, 2014a, 2014b), Switzerland (Tarnutzer et al., 2012), and France (Wallace et al., 2019).

Other studies look at the mortality of migrants in the host countries and compare it with the mortality of people in countries of origin (Wallace & Wilson, 2019). Wallace and Wilson (2019) find that the “migrant mortality advantage” relative to the origin country is present in nearly all groups, but its size depends on the development level in the origin country. Migrants originating from countries that neighbor England and Wales or feature similar levels of development, including Canada, Hong Kong, and Ireland, do not have lower death rates than those who remain in the origin country. In general, the lower the development level is in the origin country, the greater the size of the advantage of migrants in the destination country. Advantages were often largest in young adulthood (just after many migrants tend to arrive) and diminished with age and length of stay. Wallace and Wilson (2019) also find a persistent educational advantage for almost all migrant groups, which may help to explain their mortality advantage. Still others compare immigrant migrants with migrants born in the host countries. Stanaway et al. (2020) found a lower mortality rate in Italian-born men compared with Australian-born men.

An international study, which compared data from France, the United Kingdom, and the United States, shows that the migrant mortality advantage varies with the age. They found a U-shape pattern: “[...] at the aggregate level, migrants often experience excess mortality at young ages, then exhibit a large advantage at adult ages (with the largest advantage around age 45), and finally experience mortality convergence with natives at older ages” (Guillot et al., 2018, p. 14). The meta-study by Aldridge et al. (2018) analyzed 5464 studies with more than 15.2 million migrants: 5327 studies (97%) were from high-income states, 115 (2%) were from middle-income countries, and 22 (<1%) were from low-income states. The study shows that international migrants have a mortality advantage compared with general populations. They have a mortality advantage across the following categories: circulatory, digestive, endocrine, injuries, mental and behavioral, neoplasms, nervous, and respiratory. “*The mortality advantage identified will be representative of international migrants in high-income countries who are studying, working, or have joined family members in these countries*” (Aldridge et al., 2018, p. 2553).

Many refugees were from countries that do not have a well-developed healthcare system, economic resources, or the capacity for a good psychological care. This can lead to high mortality rates, particularly in the refugee camps in countries of the global south (Médecins Sans Frontières, 1997). In contrast, just a few studies on refugees in western countries show a mortality advantage for refugees but not for asylum seekers (Aldridge et al., 2018).

Most of the international and national studies in the global north on mortality find that migrants illustrate a *lower mortality* than the non-migrant population of host countries. As Deboosere and Gadeyne (2005, p. 691) note: “[...] lower mortality does not necessarily imply better health.”

2.1.2 Disease, Illness, and Migration

In this section, we highlight some of the diseases associated with migration. It is not possible for us to shed light on every disease. Therefore, we decided to present some research results on selected diseases and focused on recent studies.

Studies about *heart diseases* show different results. A higher prevalence of cardiovascular diseases was found among Middle Eastern, South Asian, and some European immigrants in Australia, and a higher frequency of CVD (cardiovascular disease) risk factors was found among Middle Eastern and Southern European immigrants (Dassanayake et al., 2009). In Western Europe, most migrant groups were at a similar or higher risk of ischemic heart disease and stroke compared with the host population (Sohail et al., 2015; Cainzos-Achirica et al., 2019). In the United States, foreign-born adults had a lower prevalence of coronary heart disease and stroke than US-born adults (Fang et al., 2018).

The analysis of the 2010–2016 National Health Interview Survey in the United States showed that migrants from Mexico, Central America, the Caribbean, and the Indian subcontinent have the highest burden of *obesity and diabetes*, while those from Southeast Asia and Russia bore the highest burden of *hypertension* (Commodore-Mensah et al., 2018). Similar results can be found by Oza-Frank et al. (2010) and Engelman and Ye (2019). A higher risk of diabetes for different ethnic groups is found in the United States (Engelman & Ye, 2019; Commodore-Mensah et al., 2018). This also seems to be the case for immigrants groups in Northern Europe (Uitewaal et al., 2004). Results in the United States show considerable heterogeneity in the prevalence of diagnosed hypertension among immigrants (e.g., immigrants from Russia and Southeast Asia have a high hypertension prevalence) (Commodore-Mensah et al., 2018). Studies on *blood pressure* in Europe show similar results (Lane et al., 2002; Nilsson et al., 2017). *Hepatitis B and C* are estimated to be higher among immigrants than the general population (Rossi et al., 2012; Hahné et al., 2013; Seedat et al., 2018). Reviews studies show that *tuberculosis* in migrant populations remains higher in most of the world regions (Kärki et al., 2014; Seedat et al., 2018; World Health Organization, 2020). It seems that most migrant groups in Europe faced higher mortality due to infectious diseases and homicide, but lower mortality due to cancer and suicide (Ikram et al., 2016).

2.1.3 Mental Health

Three cycles of the Canadian Health Measures Survey were analyzed. The results show that within 5 years migrants described better self-perceived mental health, but after immigration, this effect disappeared over time. Other predictors were older age, higher income, a better sense of community belonging, and employment. Equally, diagnosis of mood disorders was less likely to be reported in recent migrants. The migration status per se was not associated with self-reported well-being but was associated with reduced odds of being diagnosed with a mood disorder as compared

with Canadians (Salami et al., 2017). Studies in the United States show that there is a high need for mental health services for Hispanics immigrants there. Higher rates of depression, anxiety, and substance use disorders were found (Bridges et al., 2012; Alegría et al., 2007).

A study on White, Black-Caribbean, Indian, Pakistani, and Bangladeshi ethnic groups in the United Kingdom evaluated mental disorders between different ethnic groups. The propensity-matched analysis sample assessed 766 (23.8%) as having a common mental disorder, which is a similar percentage as the current population in the United Kingdom. In the propensity-matched analysis, immigrants were significantly associated with a lower risk of common mental disorders than non-immigrants (Dhadda & Greene, 2018). In contrast, studies about South Asian immigrants in the United Kingdom show higher rates of depression and anxiety (Gater et al., 2009; Taylor et al., 2013). A systematic review on schizophrenia in the United Kingdom shows increased rates, especially in Caribbean migrants (Hutchinson & Haasen, 2004). In Denmark, a researcher found an increased risk for schizophrenia (Cantor-Graae et al., 2003). Similar results on mental health were found in Sweden (Gilliver et al., 2014), Norway (Abebe et al., 2014), the Netherlands (Veling et al., 2006), and Spain (Robert et al., 2014). In Germany, studies show that a so-called migration background is a significant predictor of worse mental health outcomes (Nesterko et al., 2019a, 2019b; Janssen-Kallenberg et al., 2017). Despite anti-discrimination laws, the health of immigrants in Germany is negatively predicted by perceived discrimination (Schunck et al., 2015) and by older age, low socioeconomic status, and acculturation pressures (Janssen-Kallenberg et al., 2017).

A look at international meta-analysis or scoping studies presents the following picture. A scoping review by Patel et al. from 2017 revealed that: “[...] *whilst migrants can be at an increased risk of developing psychotic disorders and suicide mortality, they are less likely to use psychotropic medication and mental health-related services*” (Patel et al., 2017, p. 1). Another international meta-analysis of 21 studies found that migrants experience higher rates of mental health problems than non-migrants (Bourque et al., 2011). Similar results were seen with cases of schizophrenia and related psychotic disorders (Cantor-Graae & Selten, 2005; Henssler et al., 2020).

Refugees have a higher risk of some psychiatric disorders, such as psychosis, trauma- and stress-related disorders, and insomnia compared with other non-refugee migrants and the general population (Richter et al., 2018; Lindert et al., 2018; Bogic et al., 2015; Hollander et al., 2016).

Most findings show an increased rate of mental illness for so-called migrants in western states compared with non-migrants, especially for refugees and asylum seekers. It is important to consider variables like age, gender, and socioeconomic determinants, such as low income, unemployment, and a poor sense of community belonging, which influence the health outcomes of migrants (Salami et al., 2017). Refugees especially suffer from mental illness compared with non-migrants (Lindert et al., 2018) as well as labor migrants (Lindert et al., 2009).

2.1.4 Summary

According to Rechel et al. (2013, p. 1235): “*Although migrants are often, at least initially, relatively healthy compared with the non-migrant population in the host country, available data suggest that they tend to be more vulnerable to certain communicable diseases, occupational health hazards, injuries, poor mental health, diabetes mellitus, and maternal and child health problems.*” Information systems should implement an improved data collection system to get a deeper look at health differences between immigrants and non-migrants. Therefore, it is significant to combine the data with variables like gender, socioeconomic status, age, income, unemployment, social integration, and racism and discrimination.

2.2 Health Behavior and Migration

2.2.1 HIV and Obesity

While a high prevalence of overweight and obese people was found among the first generation of migrants from Turkey and Morocco (Dijkshoorn et al., 2008), this is no longer true for the second generation in the Netherlands compared with the Dutch host population (Dijkshoorn et al., 2014). A study in the United Kingdom found evidence of weight increases in immigrants during their time there (Averett et al., 2012). A higher BMI for children is found in Switzerland (Eiholzer et al., 2021) and Germany (Santos-Hövenner et al., 2019), while in Italy overweight and obese immigrants have the same dimensions as Italians. In Australia, evidence shows that so-called ethnic differences have an influence on obesity, especially for male immigrants from North Africa, the Middle East, and Oceania. This study suggests that greater acculturation may have a negative impact on immigrants (Menigoz et al., 2016). A systematic review shows weight gain in the immigrant population and greater risk of obesity over time (10–15 years after migration) compared with the native populations (Murphy et al., 2017). Another review evaluates a positive correlation between acculturation and obesity in populations migrating to high-income countries from low- to middle-income countries (Delavari et al., 2013). It seems that living in the global north increases the likelihood of being overweight or obese over the years.

A systematic search of 35 studies by Alidu and Grunfeld (2018), predominantly undertaken in the United States, Canada, Australia, and the United Kingdom, showed that acculturation is associated with weight gain and obesity amongst migrants in most studies. “*However, current literature and measures are not exhaustive and lack a detailed focus on the role of extraneous and social sources (including the media, family units, wider social networks) and the role of neighborhood or work-related influences*” (Alidu & Grunfeld, 2018, p. 739). A small study from Khafaie et al. (2016) with Iranian students who migrated to India found that migration changed the lifestyles of students in an unfavorable way. Prevalence of

smoking, no exercise, and low intakes of whole-grain bread as well as fruits and vegetables increased. After their resettlement in developed countries, even refugee children (2–16 years old) are likely to eat unhealthier and become less active (Alsubhi et al., 2020). Other factors that influence health behaviors include acculturation, environmental, socioeconomic status, cognition, and family (Alsubhi et al., 2020).

The systematic review ($n = 24$) by Michalopoulos et al. (2016) demonstrated an overall relationship between trauma and HIV risk behaviors among both forced and unforced migrant populations from low and middle income countries (LMIC). “*More specifically, sexual violence was consistently associated with HIV sexual risk behaviors and HIV infection across the studies*” (Michalopoulos et al., 2016, p. 257).

Men who have sex with men (MSM) bear a disproportionate burden of HIV in North American and European countries. The systematic review by Lewis and Wilson (2017) revealed high rates of HIV, unprotected sex, and stimulant use in foreign-born Latino samples. They also found evidence of high rates of alcohol and club drug use among foreign-born Asian Pacific Islanders, which provide baseline evidence for the theory of migration and HIV risk as syndemics within ethnic minority populations in North American and European countries (Lewis & Wilson, 2017).

2.2.2 Alcohol and/or Substance Abuse

Harris et al. (2019) used the longitudinal Swedish register data from Psychiatry Sweden² to show that there were initially fewer detectable dependency disorders among migrants (alcohol and polydrug use disorders). “*The incidence rate of any substance use disorder, including alcohol and polydrug use disorders, was between 48% and 54% lower in refugees and non-refugee migrants from similar regions of origin than the Swedish-born population, who had particularly high rates of alcohol use disorders*” (Harris et al., 2019). However, this difference disappears over time—with the exception of cannabis use—and the incidence of dependency disorders among immigrants and the Swedish-born population is leveling out. “*For all outcomes, rates in migrants converged to the Swedish-born rate over time, indicated by earlier age at migration or longer time lived in Sweden*” (Harris et al., 2019, p. 2).

Patel et al. (2017) found—with the help of their scoping review on the use of registry and record-linkage—that migrants are less likely to use psychotropic medication and mental health-related services. Likewise, Horyniak et al. (2016) found forced migrants less likely to report alcohol or drug use compared to non-forced migrants. They systematically reviewed the literature and examined substance use

²Initial cohort of 1,345,320 people born between 1984 and 1997, of refugees, non-refugee migrants, and Swedish-born.

among forced migrants³ (Horyniak et al., 2016). At the same time, there seem to be differences regarding female refugees. Based on a cross-sectional, population-based study in Sweden, female (but not male) refugees from low-income countries had a higher likelihood of purchasing psychotropic drugs than non-refugees (in this case often family members of refugees). They seem to be a risk group among immigrant women, whereas male refugee and non-refugee immigrants had the same risk patterns (Hollander et al., 2011).

A systematic review shows that young migrants from non-European countries and/or with a Muslim background (11–29 years old) consume less alcohol than native-born adolescents/young adults in European countries. The findings were mixed for tobacco and illicit drug use (van Dorp et al., 2021). For young migrants up to 18 years of age another review found decreased prevalence of some harmful health practices such as alcohol consumption, cannabis use, or use of stimulants/sedative hypnotics when compared with the majority population (Curtis et al., 2018).

2.2.3 Help Seeking Behavior

After reviewing 77 papers from nine European countries, Lebano et al. (2020) found evidence of persistent inequalities between migrants and non-migrants for access to healthcare services. There are unmet healthcare needs (especially mental and dental care) and legal barriers in accessing healthcare (Lebano et al., 2020). Lindert et al. (2008) assert that mental health and access to care facilities is shaped by migrants used patterns of help-seeking and by the legal frame of the host country. Other barriers described are language and communication barriers, overuse of emergency services, and underuse of primary healthcare services as well as discrimination (Lindert et al., 2008).

Ismayilova et al. (2014) found that labor migrants in Kazakhstan often do not see a doctor when needed (almost half of the participants). Female migrants and migrants with high mobility (additional trips to see family or friends) were at even higher risk of underutilization. Help seeking by non-English speaking migrant families with a newborn/young child seems to be mainly affected by (a lack of) cultural sensitivity/understanding of cultural practice differences on the supply side and difficulty accessing interpreters (Dougherty et al., 2020). Even migrant children show high levels of unmet healthcare needs (Curtis et al., 2018).

The systematic review of Selkirk et al. (2014) shows that three major barriers are associated with attitudes toward seeking psychological help: logistical barriers, cultural mismatch between service providers and participants, and preferences for other sources of assistance. Those who had a stronger identification with the host country's culture than their own cultural heritage, fluency in the host country language, psychological attributions of distress, higher educational levels, higher

³Refugees, internally displaced people (IDPs), asylum seekers, people displaced by disasters, and deportees.

socioeconomic status, were female and were of older age enjoyed better access (Selkirk et al., 2014). Byrow et al. (2020) showed cultural barriers, including mental health stigma and knowledge of dominant models of mental health, as one of three main barriers to help seeking. “(S)tructural barriers, including financial strain, language proficiency, unstable accommodation, and a lack of understanding of how to access services, and (c) barriers specific to the refugee experience, including immigration status, a lack of trust in authority figures and concerns about confidentiality” (Byrow et al., 2020, p. 1).

An overview of nine systematic reviews by Parajuli and Horey (2020) to identify barriers and facilitators to health service utilization by refugees in resettlement countries found three main barriers as well. Those issues were related to refugees (e.g., sociocultural factors, effects of previous experiences), health services (e.g., knowledge and skills of health professionals), and the resettlement context (including policies and practical issues). In contrast, behaviors of health professionals, health service responses, and approaches to care can facilitate help seeking. Even so, more research is needed to evaluate facilitators (Parajuli & Horey, 2020).

2.2.4 Summary

On the one hand, in most studies, so-called migrants seem to have a greater obesity risk over time. It seems that being in the global north and, especially, acculturation processes increase the likelihood of being overweight over the years. Studies also found baseline evidence for the theory of migration and HIV risk as syndemics within ethnic minorities. On the other hand, there seem to be fewer dependency disorders among migrants in contrast to people born in the host countries, but difference disappears over time. Female refugees could have special risks. Findings for young migrants, up to 18 years old, are mixed. Different studies concerning help seeking behavior found inequalities between migrants and non-migrants in access to healthcare services. Female migrants and migrants with high mobility were at even higher risk of underutilization. Barriers seem to be manifold.

2.3 Excursus: COVID-19 and Migration

In the United States, so-called ethnic minorities seem to be “at increased risk of acquiring COVID-19 and experiencing greater severity of infection and are at excess risk of death” (Abuelezam, 2020, p. 455). With the help of a systematic review and meta-analysis, Sze et al. (2020) found that in the United Kingdom and the United States individuals from Black and Asian ethnicities had a higher risk of COVID-19 infection compared with White individuals. Those of Black ethnicity were twice as likely to become infected with SARS-CoV-2 compared with White individuals. Although the relationship between COVID-19, ethnicity, and specific clinical outcomes is unclear in this research study, the authors assume that

overcrowding, working conditions, racism, and structural discrimination (see also Wang et al., 2021) are the reasons for inequities in the delivery of care (Sze et al., 2020). Especially for Arab Americans Abuelezam (2020) assumes that higher infection and complication rates could also be influenced by “*xenophobia and stigma, pre-existing conditions, crowded living conditions, lack of social support for new immigrants, and poor adoption of prevention behavior*” (Abuelezam, 2020, p. 455). Underlying health conditions, such as diabetes and hypertension, which are known risk factors for increased severity of COVID-19 and death, are more prevalent in Arab Americans than among white populations in the United States. Ayoubkhani et al. (2021) make similar considerations. With the help of a census-based data set, they investigated firstly an ethnicity-specific substantially elevated mortality risk during the pandemic in England and Wales. “*Secondly, this elevated risk was largely attenuated by location, living circumstances, socioeconomic factors, occupational exposure and self-reported health status*” (Ayoubkhani et al., 2021, p. 1957). Particularly for males and during the pre-lockdown period some residual differences in risk remained. To understand the causal mechanisms further research is needed (Ayoubkhani et al., 2021, p. 1957). Suhardiman et al. (2021) video-interviewed 44 international and domestic *labor migrants* from Bangladesh, India, Laos, and Myanmar working in Laos, Myanmar, China, Singapore, and Thailand to understand how COVID-19 and ensuing policy responses shaped their mobility, evolving livelihoods, and well-being. They found that: “*informal migrants faced heightened exposure to the virus under conditions of forced evictions, food shortages, job losses without any compensation payment, quarantining in cramped and unhygienic conditions, limited access to health care, and chaotic border-crossing areas*” (Suhardiman et al., 2021, p. 102).

Refugee communities have been affected in various ways by the impact of COVID-19 and political reactions. Migration routes and therefore movement had been blocked. Also, refugees live in remote and isolated camps or in urban settings under precarious conditions that promote contagion with COVID-19.

When looking at Syrian refugees in Lebanon, Fouad et al. (2021) found vulnerability factors that directly impact important parameters of transmission dynamics, namely the physical environment in which refugees reside, especially the high levels of crowding, where physical distancing is virtually impossible. Inadequate access to clean water for hand and face washing complicates prevention. Limited use of masks, due to inadequate access and low levels of awareness, puts refugees at higher risk of contracting the infection. Inadequate access to healthcare (see above) and lack of awareness of symptoms and recommended course of action are also factors that may impact R^4 by increasing the duration of infectiousness (Fouad et al., 2021).

An online survey of Bhutanese and Burmese refugees in the United States ($n = 218$) shows the following risk factors for a COVID-19–infection: being an essential worker during the pandemic (e.g., in food supply chain industries, working at packing plants), having an infected family member (in multigenerational

⁴ Average number of infections generated by one infected individual.

households), and being female (as females are more likely to care for family members with COVID-19) (Zhang et al., 2021).

2.4 Explanation Models for the Health Status of Migrants

How can these health differences be explained? There are diverse approaches that describe the positive as well as negative effects on the health and mortality on migrants. These factors can differ in the migration phase: premigration risk factors, migration (in transit) risk factors, and postmigration risk factors (Priebe et al., 2016). The influence of different factors depend on age, gender, socioeconomic status, unemployment, and social networks (Salami et al., 2017). Below we briefly present the most important effects.

2.4.1 Migration and Stress: Migration Stress Hypothesis

Migration can be described as a critical life event, which goes hand in hand with other great challenges. Migration and acculturation processes are often correlated to a special stress situation—even without the presence of a flight history or even traumatization—and can thus influence mental health and the emergence of mental and physical illnesses. Torres and Wallace (2013) argue that there is a significant relationship between premigration circumstances and postmigration psychological and physical health. Different stressors, like insecure living conditions/housing, legal residence rights, chronic occupational stress, (threatening) unemployment, isolation due to persistent separation and changing network relationships, marital problems, and intergenerational conflicts of norms and roles are recognized.

2.4.2 Economic and Occupational Stress as a Structural Effect: Theory of Underprivileged

Another negative effect is correlated to the theory of underprivileged status of migrants. Meta-reviews show that race, socioeconomic status, and gender do have an influence on health separately as well as combined (Williams et al., 2010). Migrants are frequently socially disadvantaged compared with non-migrants in areas like education and employment (Nazroo et al., 2020). Refugees and asylum seekers especially seem to be particularly affected (Richter et al., 2018). Socioeconomic status before crisis and migration provides limited protection (Bauer et al., 2020).

2.4.3 Healthy Immigrant Effect and Their Explanations

A systematic review in Canada shows a healthy immigrant effect. It appears to be strongest during adulthood but less during childhood or adolescence and late in life. A foreign-born health benefit is likewise more robust for mortality but less so for morbidity (Vang et al., 2017). This Healthy Immigrant (or Migrant) Effect for mortality is explained in different ways. The positive outcome is explained by a healthy, strong, and young effect, by a healthy lifestyle effect based on, for instance, religious reasons (e.g., alcohol and drugs are not allowed in religious communities), and by the healthcare systems effect in the host countries. It is argued that migrants do combine advantages and have been confronted with different circumstances in the country of origin and host country (Vanthomme & Vandenheede, 2019).

2.4.4 Use of Health Services: Barriers to Entry

In the United States, the identified barriers to receiving services were cost, lack of health insurance, and language (Bridges et al., 2012). An international review shows barriers encountered by refugees, asylum seekers, and irregular migrants in accessing mental healthcare. Those barriers include a lack of knowledge regarding their healthcare entitlements and of the healthcare systems in the host country, poor language expertise in the host country, belief systems and cultural expectations for healthcare, and a lack of trust in professionals and authorities in the official healthcare system (Priebe et al., 2016; Lebano et al., 2020).

2.4.5 Racism and Exclusion

Discrimination and social exclusion have negative effects on health (Henssler et al., 2020). A correlation between perceived ethnic discrimination and well-being in ethnic minority groups can be found. “*As such, ethnic inequalities in depression could be reduced substantially if ethnic minority groups would not perceive any ethnic discrimination*” (Ikram et al., 2015, p. 243).

3 Social Networks of Migrants: The Role of Social Networks in the Migration Process

While the concept of social networks has played a role in migration research at a very early stage (e.g., chain migration) (Boyd, 1989; Jedlicka, 1978), methods of network analysis have only been used more recently (Lubbers et al., 2010; Gamper & Reschke, 2010). It is striking, however, that network analysis is mainly related to social capital theory (Gamper, 2015) and the support provided by migrant networks

is examined (Portes, 1995; Pohjola, 1991). Against this background, the studies can be distinguished between structure-describing and resource-oriented research perspectives.

From a *structure-describing* research perspective, the relationships and the network structure of migrants and their individual embedding in the social environment are examined (Lubbers et al., 2010; Gamper et al., 2013). There is often a strong reference to network analysis, but it also includes other methodological approaches. *Resource-oriented* approaches tend to focus more on the support services available (e.g., monetary loans, emotional support) (Bashi, 2007). Even though some of these approaches refer to networks, network analysis in the narrower sense of the term is rarely used.

In addition to the preceding methodological distinction, networks can theoretically play an important role in three different phases of migration: Firstly in the decision to emigrate, secondly within the migration or migration process, and thirdly after arrival in the destination country. These three processes can repeat in the life course. In this context, research focuses on different aspects.

3.1 *Decision-Making on Migration*

As early as 1964, MacDonald and MacDonald introduced the concept of chain migration. They assume that pioneer migrants influence the actors in their network by providing support and information. It is argued that pioneer migrants are exposed to high migration costs and risks, while subsequent migrants have to make less effort, as they can mobilize their network resources—those who migrated before them—to find work or housing and to get help in obtaining or filling in official documents (Fussell & Massey, 2004).

Studies have shown that, regardless of the previous migration experience of the interviewees, the probability of migration increases if they make contact with actors in the country of arrival (e.g., good friends, family) (Massey et al., 1993; Palloni et al., 2001). With the help of simulations, Teteryatnikova (2013) was able to illustrate that even a small increase in personal contacts with people in a destination country can significantly increase the migration rate. In some cases, experienced migrants even explicitly look for newcomers, carefully selecting which actors support them (Bashi, 2007).

However, the influence of social networks on decision-making should not be seen as exclusively positive. There are three arguments regarding this. Networks can (1) limit the selection of emigration destinations through so-called “migration corridors.” Certain migration groups focus on certain destination countries, which can lead to dependency (e.g., costs for smugglers) (De Haas, 2007; Parsons et al., 2007). Although the effects of network structures have not yet been researched in detail, researchers assume that (2) dense networks and strong, supportive connections in the country of departure (e.g., through close emotional ties) can also prevent migration (Haug, 2008). Finally, (3) network-based migration can lead to

dependency on both individuals and entire economies, for example by making countries dependent on remittances (Boyd, 1989).

3.2 Migrant Networks in the Transit or Border Crossing Phase

Another line of research sheds light on the role of social networks during migration along the different migration routes. Recent ethnographies (e.g., Andersson, 2014) describe the physical dangers, violence, and exploitation migrants often face on south to north routes. The few studies dealing with the role of social networks in this phase argue that personal ties facilitate border crossing. For example, personal connections provide valuable information on how to find helpers or smugglers to cross national borders (Bilecen, 2012; Garip, 2016). Koser (1997) argues that the social network approach is crucial for understanding the asylum process. Koser and Pinkerton (2002) further argue that social networks influence the when and where of migration. Recent findings among Syrian refugees in Jordan also point out that the increasingly restrictive entry policy of Jordanian migrants forces them to resort to weaker ties—professional actors and smugglers who, in turn, influence the migrants' travel plans and provide coping strategies (Lagarde & Dorai, 2016). Against this background, network analysis as well as other methods for the description of relations will be used.

3.3 Migrant Networks in the Post-migration Phase

The majority of migration studies on social networks focus on the post-migration phase. These studies primarily focus on egocentric networks and often relate them to controversial concepts such as social integration or social assimilation. To this end, the research analyzes general characteristics of the network, such as the size and composition of the network in relation to the number of the “native population,” “compatriots,” and “other migrants.” Other factors are, for example, the role of the alteri (e.g., work colleagues, friends) or the strength and duration of the bond (e.g., Bashi, 2007; Brandes et al., 2008, 2010; Kindler et al., 2015). The main assumption of this research is that the more ties migrants have with the native population in the country of immigration, the higher is their social integration (Eisenstadt, 1952; Gordon, 1964; Nauck, 1989; Facchini et al., 2014). Studies show that migrants depend heavily on contacts with their compatriots in their new country of residence in the first arrival phase (e.g., Bashi, 2007; Bauer et al., 2009), but then the networks become more and more heterogeneous over time (Facchini et al., 2014).

In addition to describing personal networks in terms of their size, composition, and structure, researchers have analyzed the social support services in networks.

They focus on the support provided by local, international, and transnational relationships (e.g., Bilecen, 2016; Herz, 2015; Schweizer et al., 1998; Olbermann, 2003). Although research generally assumes a positive relationship between perceived stress or health and networks, it is usually not analyzed through network analysis.

Social capital research also focuses on the exchange of resources in migrant networks. Theories of social capital tend to combine concepts of support and social integration. The focus here is primarily on “integration” into the labor market (Sommer & Gamper, 2018). The studies available to date show that integration into the labor market depends not only on networks but especially on the respective context conditions. On the basis of the Migrations between Africa and Europe Project (MAFE), a recent network study by Toma (2015) showed that the connection to former migrant women on arrival has positive effects on the economic situation of Senegalese men in France. France’s Senegalese community is socioeconomically diverse and thus offers many points of contact. Such a network effect is not found in Spain or Italy. Here the networks are usually concentrated only in the low-wage sector. These findings suggest that the functioning of personal networks and their results also depend strongly on the legal, economic, and cultural context in which these networks operate (e.g., Sommer & Gamper, 2021; Lubbers et al., 2020).

While the classical migration research presented above understands the migration process as a “one-way street,” there are research projects that can be subsumed under the term transmigration (Bilecen et al., 2018). Here, social networks of relationships are of particular importance. The concepts of “transnationalism” (Pries, 2008), “transstate spaces” (Faist, 2007), and “social fields” (Levitt & Glick Schiller, 2007) should be mentioned here. These studies focus on the network of relationships of (trans-)migrants (Lutz, 2008), who are usually both spatially and socially mobile, who span their social network globally and often commute between several states. “Trans-” describes the social, economic, political, and cultural cross-border relations of migrants and the active shaping of these constructed border spaces. Qualitative as well as quantitative network research examines, for example, the nature of relationships, social benefits, and the role of the Alteri in these transnational networks (Lubbers et al., 2020; Dahinden & Ryan, 2021).

4 Migration, Social Networks, and Health

While there are numerous studies on the topics of “migration and health or health inequalities” and “migration and social networks,” research that covers all three areas together is very rare and almost always looks at only one population group—exclusively migrants without comparison groups—without additionally broadening the view to vertical dimensions of inequality such as income or education. Most studies also use the concept of the network as a metaphor, a synonym for group or social capital. Or else, they exclusively investigate social support as a central function of social networks. Particularly with reference to the migration stress

hypothesis mentioned in Sect. 2.4.1 and the resource-oriented research perspective mentioned in Sect. 3, social support from social networks as a buffer against migration-related stress is then examined alongside personal resources (e.g., beneficial control convictions, optimism, material resources). The connection between social support and the psychological well-being of migrants has been proven in many cases (Jasinskaja-Lahti et al., 2006). For example, an adequate social support system reduces the probability of manifested psychiatric disorders (Jasinskaja-Lahti et al., 2006), and effective social support reduces many developmental risks for migrants (Ralston & Escandell, 2012).

Below we present research that attempts to link all three areas—migration, health, and social networks. We use a very broad concept of “migration” and also list studies that work with the terms “race” or “ethnicity” or examine internal migration (e.g., from rural to urban areas). The presentation is divided thematically into studies on physical health and healthcare, coping with health problems, pregnancy, contraception, infant health, and mental health and quality of life. As mentioned above, the studies were made without comparison groups.

4.1 Physical Health (Transplantation, Cancer, Coronary Heart Disease) and Healthcare

Cetingok et al. (2008) examined the effects of social support on the mental and physical health of 258 transplant recipients. For this purpose, the authors used network cards in which the subjects could mark their relationships with friends, acquaintances, and family members. Measures such as network size and form of support were then statistically evaluated. The authors interviewed persons who were differentiated according to their gender, social class, and “race.” Close and other family members provide the most support. The authors also point out: “*African Americans reported a higher frequency and longer duration of social support than did whites [. . .]. Social and nursing intervention may improve the network closeness in males and may also augment support frequency and duration for whites*” (Cetingok et al., 2008, p. 87).

Another study uses so-called resource generators in order to investigate the social support of Chinese people with cancer living in Hong Kong. Different types of support were surveyed, the role of the age group was investigated, and the size of the support network was included in the statistical calculation. The results support the connection between social support and coping successfully after being diagnosed with cancer. During the postoperative phase, material and informational support seems to be more relevant for effective coping than emotional support. In addition, the involvement of family members in patient care is crucial (Chan et al., 2004).

Pollard et al. (2003) looked into the influence that (the lack of) social support could have. They compared 684 South Asians⁵ and 825 Europeans⁶ in Newcastle upon Tyne (Britain) concerning the influence of social network size for having coronary heart disease risk factors (health behaviors such as smoking and being overweight, blood pressure, serum lipid profile). Social network size is composed of marital status, household size, contact with friends and relatives, and attendance at worship gatherings. The only significant relationship found in this study was that Europeans, but not South Asians, with larger social networks were significantly less likely to smoke. However, they found that: “*South Asians, as a whole, had smaller networks of relatives and friends outside the household, but bigger household networks, and more contact with others at places of worship*” (Pollard et al., 2003, p. 273). Overall, “*there was no clear evidence of a protective effect of larger social networks for abdominal obesity, blood pressure or serum lipid profile*” (Pollard et al., 2003, p. 274). The secondary evaluation of the Mexican Migration Project (MMP) by Ralston and Escandell (2012) studied 1776 Mexican men between 17 and 89 years of age (interviewed between 1998 and 2009). The influence of social networks on the use of hospital care by Mexicans in the United States was examined. Network relationships are surveyed via closed questions, such as whether the mother, father, or siblings lived in the United States during one of their last migration stays (0–6, close family contact), so that social networks as the respondent’s family and friends’ past and current migration experience to the United States is conceptualized (Ralston & Escandell, 2012, p. 327). The Mexican Migration Project shows the importance of (especially close) family social networks of migrants as mediators in the healthcare system. Migrants with a higher number of family members who have migrated themselves are also more likely to use hospital care. Friendship networks did not show any significant influence. “*Mexican migrants likely rely on family members for information about healthcare alternatives because close family networks facilitate higher levels of trust and obligation*” (Ralston & Escandell, 2012, p. 333).

Another qualitative network study (48 in-depth interviews) analyzed the role of social networks on the health behaviors of Sri Lankans and Anglo-Australians. The study shows that the decision-making process involved in seeking help for depression is highly correlated to interactions with actors in the social network. Social networks have a great influence over the care trajectory of people living with depression. Strong ties (e.g., parents) especially have influence and provide emotional and practical support. According to the authors: “[...] *the role of social networks is pivotal in uptake of formal care, and engaging with communities to improve responses of social networks to mental illnesses may provide a bottom-up avenue for improving uptake of mental health services in migrant communities*” (Antoniades et al., 2018, p. 1376).

⁵Newcastle residents with ancestral origins in India, Pakistan, or Bangladesh who had at least three grandparents born in those countries.

⁶Newcastle residents with ancestral origins in European countries.

4.2 Tackling Health Problems

The explorative research work of Li and Wu (2010) based on case studies investigate the role of social networks for Chinese people migrating from rural regions to the urban region of Beijing in coping with health problems. For this purpose, the authors conducted semi-structured interviews with 36 migrants (16 women and 20 men, 18–50 years old), which were evaluated using the Grounded Theory. The network size and composition were determined on the basis of with whom the respondents feel closely connected or with whom they have regular contact. In the interviews, social and especially family network members were seen as a great support for critical life events. In times of financial need, siblings and nephews, but also friends with the same migration history, are approached for help. Emotional support also comes primarily from the above-mentioned support sources. However, the strong reference to so-called strong ties who do not live at the place of arrival and lose contacts outside the family networks prevent the interviewees from turning to people in their environment in emotionally stressful situations (loneliness, lack of sleep) of migration. Restricted and missing social networks at the place of arrival thus have a negative impact on the state of health as well as access to healthcare. According to the authors: *“However, due to the limited social networks of migrants in urban areas, it is difficult for them to obtain useful health information or information sources at the right time”* (Li & Wu, 2010, p. 375).

In the early, representative research work of Chatters et al. (1985), informal helpers’ networks of 581 older “blacks” were surveyed, and their structure as a dependent variable (network size and composition) of health factors was investigated. The network survey was conducted on the question of who would help with illness and health restrictions (e.g., physical disability). A list of 12 persons (partner, son, sister, friend, neighbor, etc.) was presented, and they were grouped into categories. Unmarried, childless respondents had smaller networks, and women indicated more supporters than men. However, the experience of health restrictions, disabilities, and health problems, and the satisfaction or dissatisfaction with one’s own health status (as health factors), had no significant influence on the network size and composition (kin/non-kin/mixed).

4.3 Pregnancy, Contraception, and Child Health

The qualitative study by Chakrabarti (2010) aims to show the importance of social networks for the healthy pregnancy of Bengali women in New York. On the basis of 40 in-depth interviews, the author proved that local relationships are helpful, but transnational relationships also play an important role. Material and “virtual” support from personal face-to-face contacts such as telephone conversations seemed significant. Advice on healthy pregnancy, healthy nutrition, and food preparation, but also

therapeutic conversations, proved to be important forms of support through “therapeutic networks.”

Wakeel et al. (2013) also examine the connection between pregnancy and available personal capital. They ask to what extent belonging to different ethnicities (Hispanic, Black, White, Asian/Pacific Islander, extracted from the birth register) influences the personal capital available during pregnancy and what role the socio-demographic characteristics of the 3716 mothers surveyed and their acculturation factors (origin, language spoken at home) play in this context. Personal capital was recorded as a scale of 30 items weighted by groups, consisting of individual resources (e.g., self-esteem, seven items), partnership support (*Fragile Families Study*, six items), family and friendship support (*Pregnancy Risk Assessment Monitoring System*, seven items), and neighbor support (*Project on Human Development in Chicago Neighborhoods*, ten items). The calculations were initially based on one-way ANOVA tests and then on multivariate, generalized linear models to understand the relationship between personal capital and socio-demographic data as well as acculturation factors. In this context, existing differences in available personal capital between Black-White and Hispanic-White were elucidated by socio-demographic characteristics such as income, education, and marital status. Thus, low socioeconomic status, single parenting, and low acculturation are mainly decisive for lower personal and social resources (capital), which in turn can influence maternal and child health. All in all, the study provides group comparisons, but the focus on health is pushed into the background—only the choice of mothers as interviewees and the view on the future health of mother and child, possibly influenced by the social network, are considered.

Similarly, Blackstock et al. (2010) examine the influence of social networks and primary healthcare (such as family doctors) on family planning and contraceptive use. The starting point is the increasing number of unplanned pregnancies, especially among African-American women, from the lower social strata in urban areas. Unplanned pregnancies are often associated with poorer health of mothers and newborns. In the 20 semi-structured interviews, the women revealed the importance of female network members, particularly for (first-time) information on contraceptives (often from female relatives) and the development of attitudes and subjective norms regarding their own family planning.

Using data from the Health and Migration Survey (HMS), Donato and Duncan (2011) explore the impact of parental migration on child health by comparing a total of 804 children of parents who have migrated from Mexico to the United States, remigrated, or never migrated, in terms of their mother’s assessment of their health. Family network resources (as an independent variable), network size, frequency of contact, and residence were surveyed by closed questions about relationships and interactions and support of family members (parents, siblings, cousins, uncles/aunts, grandparents, in-laws) and an open question about other, unmentioned network relationships. Where children in the United States have better health than children in Mexico, especially compared with children of remigrated parents, social networks have no (buffering) influence on the health of remigrated children. In some cases, close network members of remigrated families may be disappointed by the lack of

financial support, or their absence due to migration may have weakened family relationships. In contrast, social networks (as weekly meetings with friends and family, along with the mother's health and education) have a positive influence on the health of children living in the United States.

4.4 *Mental Health and Quality of Life*

The work of Vega et al. (1991) questions the influence of social networks (role relationships, frequency of contact, satisfaction) and the social support for 679 Mexican migrant women suffering from depression in the United States. "*Family support and family income are the best predictors of low depression scores for immigrant Mexican women. In contrast, interaction contact frequency with friends and family is not correlated with depression*" (Vega et al., 1991, p. 159). The significant role of (new) support networks in the country of arrival could explain why Mexican migrant women—despite great challenges—are not exposed to a higher risk of disease.

The research by Teodorescu et al. (2012) also focuses on mental health. For 55 adult refugees in psychiatric care in Norway, they show a strong association between post-traumatic stress and depressive/psychopathological symptoms with weak social integration and small friendship networks, whereas larger networks are more likely to be associated with post-traumatic growth. As a measure of social networking, the question: "How many good friends do you have? Count those with whom you can talk in confidence and who can help you if necessary," (Teodorescu et al., 2012, p. 319) the size of the friendship network was chosen as a measure of social network. Social integration, meant as integration into Norwegian society, was measured by four items: language, reading Norwegian newspapers, Norwegian visitors, and help received from Norwegians.

Another study by Chandra and Batada (2006) investigates the perception of stress, social support, and coping strategies of 26 young African-Americans in ninth grade using a triangulative research design that includes ego-centered network cards to survey support networks. Depending on the topic—stress in the partnership or conflicts in school or family—different sources of support (partnership—friends, school—family) were requested. In addition, African-American girls report about active requests for help more often than boys.

Finally, Baxter et al. (2015) surveyed 1039 Hispanics and non-Hispanic Whites over 60 years of age in the United States on the influence of network size ("How many close friends/relatives do you have?") and contact frequency on the subjectively perceived quality of life. Regardless of "race" and "ethnicity" (which remain unclear as terms), a larger number of close friends and relatives and frequent contact with them have positive influence on the subjectively perceived quality of life, although this effect is more pronounced for non-Hispanic whites.

We ultimately found that transnational networks have a strong positive effect on how ageing migrants perceive their health (Cela & Di Barbiano Belgiojoso, 2019).

5 Conclusion and Desiderata

5.1 *Desiderata on Migration and Health*

The research field about migration and health is wide and quite heterogeneous. The studies give a good view of the issue but there is still some work to be done to study the link between migration and health, which has been documented for certain groups. To determine the influences of the majority society/dominant culture on the health of migrants, for example, comparative studies within different host countries would be needed. Although research shows that, for example, race, class, and gender are interrelated, more research is needed that is intersectionally designed to explain the interaction of multiple variables in more detail (Malmusi et al., 2010). Therefore, it is significant to combine the data with variables like gender, socioeconomic status, age, income, unemployment, social integration, and racism and discrimination. The data collection system should be improved and internationalized, in cooperation with countries of the global south especially, to get a deeper look at health differences.

Also, it is important to remember that migration is not a disease and is not pathological. In some cases, migration can be linked to different disease phenomena, but the correlation has to be discussed carefully. Many good quantitative studies can significantly draw correlations. However, there is a lack of qualitative research that traces the subjective view of those affected and attempts to better understand the links between migration and health.

It remains to be asked to what extent the phenomena associated with the concept of migration are actually migration-specific—whether, for example, there is a link to a concrete migration process or whether other social group affiliations have (higher) explanatory power for health inequalities like class and, therefore, income or educational status (Sheldon & Parker, 1992).

5.2 *Desiderata on Migration and Social Networks*

As the studies presented in Sect. 3 have shown, social relations play a major role in the migration process. However, we have to point out that although many of these studies examine relationships, a deep structural analysis (e.g., ERGMs) usually does not take place. With such an analysis, significant relationships between personal attributes (e.g., age, migration background) and relational aspects (e.g., density) could be identified. For example, measures such as network size and network roles (e.g., family, friends) are used as variables, but the analyses hardly go beyond that. Furthermore, the term “network” is often used as a synonym for group, social capital, or social support. The few network studies that do exist can be assigned to the ego-centered network analysis and focus mainly on the aspects of social integration or assimilation of migrants in the “host society.” Negative relationships (see

chapter “[Negative Ties and Inequalities in Health](#)”) such as racist attacks or hostility are a desideratum so far. Studies on networks in the transit situation are also scarcely found.

5.3 *Desiderata on Health, Migration, and Social Networks*

Research linking health, networks, and migration is scarce. The few internationally available research works—primarily in the case of illness (transplant recipients, cancer, health problems in general)—relate to health behavior, health, and the use of healthcare and the support of networks. There are also studies with a preventive focus on quality of life, stress management mechanisms, or the handling of special life situations, such as pregnancy. Social networks are almost exclusively the independent variable.

In the studies presented, it becomes clear that social support can be very helpful. Support from the family, ongoing support in case of illness, and social integration through regular contacts play a central role. It is also striking that studies comparing “ethnic groups” are very rare. The focus here is usually on a specific migration group, such as Chinese women in Hong Kong.

However, beyond the size and the distinction between strong and weak relationships, which are often not discussed theoretically in the available studies, structural analyses are hardly found. In Sect. 3, “Social networks of migrants,” it becomes clear here that there is a deficit in the *analysis of* social networks. In addition, there is a lack of longitudinal studies that take into account the changes in networks or that investigate the direction of the context: In other words, whether networks influence health or health behavior or whether health or health behavior influences the networks (e.g., homophilia).

In addition, we have quoted studies that question people who have migrated and changed their place of residence (which, with regard to transmigration phenomena, occurs several times in commuting movements) and who are exposed to other contexts of belonging and possibly other influences on their health because of their ethnicity or simply because of their “skin color.” We consider it necessary to differentiate between these factors and plead for studies that, especially in German-speaking countries, question particularly vulnerable target groups (e.g., refugees, unemployed migrants) in a differentiated way.

6 Outlook

Before we give an outlook on possible future research we want to frame the studies mentioned above: studies with a so-called migrant focus on the global south and on migration routes from south to north. We rarely have information about the health of migrants traveling from north to south.

What should future studies look for in order to fill the research gaps we have identified? Against the background of the lack of overall network analyses, an attempt should be made to find fields of research (e.g., school classes, retirement homes) in which overall network measures can be used for the analysis. Here, new insights could be gained that take structural aspects in particular into account even better and reveal new connections beyond individual attributes (e.g., age, role). In ego-centered network analysis, it would be empirically important to include name generators and age-age relationships even more strongly in order to be able to calculate further structural measures here as well. Density or even clique formations would be attributes that could provide new insights, for example. Also, an extension of the network studies, which have so far been strongly focused on support, to other functions and mechanisms of action realized in social networks, such as social inclusion, influence, infection, or burden (see chapters “[Social Network Mechanisms](#)” and “[Negative Ties and Inequalities in Health](#)”), would in our opinion be useful. In general, it would be logical to link health, migration, and network variables even more closely, without directly considering certain phenomena as typical for migration, but always including the concept of intersectionality (e.g., gender, class) in one’s own research. Finally, as *indicated* in the dissertation by Olbermann (2003) on social networks of older migrants ($n = 99$), it would be important to take into account the life-specific characteristics of migrants and to consider social relationships as a dependent variable. In the study mentioned above, for example, older, unemployed, or early-retired migrants lacked financial resources to maintain social network relationships, which means that the health-related reduction of their social networks observed among very old people is likely to occur earlier among migrants (Olbermann, 2003, p. 144).

Reading Recommendations

- Cetingok, M., Winsett, R. P., Russell, C. L., & Hathaway, D. K. (2008). Relationships between sex, race, and social class and social support networks in kidney, liver, and pancreas transplant recipients. *Progress in Transplantation*, 18(2), 80–88. *An exploratory-descriptive analysis focused on social support, examining mental as well as physical health by socio-demographic and ethnic characteristics.*
- Donato, K. M., & Duncan, E. M. (2011). Migration, social networks, and child health in Mexican families. *Journal of Marriage and Family*, 73(4), 713–728. *A quantitative comparative study between migrant, non-migrant, and remigrated families. The results are exciting, but the calculated network measures are not in focus.*

Data Sets/Overview

- The Socio-Economic Panel (SOEP) of the German Institute for Economic Research (DIW) has included a sample of people with a so-called migrant background (immigrant sample) and items to depict egocentric networks since 1994/95; see <https://www.diw.de/soep/>

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Desiderata: Social Networks and Health Inequalities: Which Questions Remain Open?



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1 Introduction

“Tell me how much your friends earn, and I’ll tell you if you smoke, what diseases you have and how long your life will be!” With this somewhat pointed statement, we wanted to shed light on the empirically well-confirmed connection between social

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and health inequalities from the perspective of network research at the beginning of this book (see chapter “[Social Networks and Health Inequalities: A New Perspective for Research](#)”). Social networks are understood here as mediating entities at an

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intermediate or meso-level, whose structure and function mediate between vertical (income, education, occupational status, etc.) as well as horizontal (e.g., age, gender, ethnic origin) inequalities and health inequalities (e.g., life expectancy, morbidity rates). Besides this mediating influence a moderating relationship wherein social networks amplify or diminish vertical and horizontal inequalities seems to be reasonable.

In this way, an attempt is made to place a “meso-founded” approach between macro- and micro-founded levels of health science, which necessarily combines the macro- and micro-perspectives. With this claim, network research locates itself between classical macro-sociological approaches, which refer to large groups (e.g., social classes, gender), and micro-founded approaches, which emphasize individual health conditions, preferences, and behavior. It also takes up the criticism of Emirbayer (1997), who, on the one hand, criticizes overly simple models of rational and self-interest-oriented actors but, on the other hand, also criticizes approaches that assert the strict primacy of norms or social structures that “guide” the actions of subjects. Within the social network, individual preconditions, such as genetic make-up, personality, preferences, and so forth, encounter each other and the social “structuration” (Giddens, 1984) through vertical and horizontal inequalities. On the one hand, social networks are influenced by the individual, while on the other hand, network changes affect the individual.

In order to clarify the links between individual health, networks, and social inequality, a number of prerequisites are needed, to which the first part of this volume is devoted. Within the scientific discourse of social relationships, social capital, and social networks, various terms are not clearly distinguished from one another and are sometimes used synonymously. As a result, those terms often remain unclear, which makes a unified definition and understanding of social relations and social networks difficult. In order to contribute to a clearer understanding, Nico Vonneilich presents a classification of terms and concepts (see chapter “[Social Relations, Social Capital, and Social Networks: A Conceptual Classification](#)”). In his contribution to network theory, Markus Gamper (see chapter “[Social Network Theories: An Overview](#)”) suggests to understand “networks” primarily in structural terms, as a set of nodes (actors at different levels of aggregation) connected by edges (relationships of various kinds), through which an exchange (of information, emotions, goods, etc.) takes place. Social capital can thus be understood as the presence of nodes and edges that are beneficial to health, while social support can be understood as its effect. The probability of the occurrence of productive nodes and edges would be moderated by vertical and horizontal inequalities. At the micro-level of individuals those inequalities manifest themselves in advantageous or disadvantageous health effects (with regard to morbidity and mortality as well as subjective health perception). At the macro-level that moderation should be reflected in socially unequally distributed mental and physical health states, that is, health inequalities.

In their chapter, Andreas Klärner and Holger von der Lippe discuss further possible causal mechanisms in social networks: social integration, social influence, and (social) contagion (see chapter “[Social Network Mechanisms](#)”). As their contribution shows, these concepts are heuristically useful as collective terms. A

general, parsimonious, and selectively working theoretical model, however, in which the possible connections can be precisely defined and differentiated, is still lacking. According to the authors, future research will have to take into account the distinctions between (1) direct and indirect and (2) positive and negative health effects caused by (3) different actors or sectors of networks. Future research should address these aspects in various ways for different risks of disease.

As the authors of all contributions to this work make clear, the concept of network is still too often used merely as a metaphor in the literature; for example, it stands for “frequency of contact with parents and friends” or for “social support,” but is not operationalized in a structural way. Network studies using the abovementioned structural approach are still relatively rare in the field of health inequality research. The authors of this work also point out that there is still a considerable need for theoretical and methodological development in the area of social networks and health inequalities. In order to provide the required “meso-foundation” of network-driven health sciences between macro- and micro-processes, it is necessary to further develop the existing theoretical models (see chapter “[Social Networks and Health Inequalities: A New Perspective for Research](#)”) and to apply the methods of network analysis (see chapter “[Network Analysis and Health Inequalities: A Methodological Introduction](#)”) in a consistent way. For example, health risks and resources in the network should be modeled as parts of the living environment while being relatively independent of the individual. For example, the exposure to smoking classmates is greater for young people from lower income groups, regardless of whether they themselves smoke or not. This extension of the model is achieved by the overall network analysis, which includes all nodes and edges within a defined space. The actors (as nodes) have relationships even without the agency or knowledge of the individual (alter-alter relationships). These (sometimes perhaps unconscious) relationships in turn have an effect on nodes and edges within the ego-centered network, which can then affect individual health. Furthermore, qualitative and ego-centered network procedures also enable researchers to expand the space of possible influences of the social network on health by adding previously unknown actors (nodes) as so-called actor generators. However, all authors of this volume agree that the field of network research in medical and health sociology as well as in social epidemiology has large gaps with regard to the consideration of alter-alter relations and with regard to the inclusion of additional actors.

A considerable structural expansion of network research is demanded by Philip Adebahr (see chapter “[Negative Ties and Inequalities in Health](#)”)—the inclusion of so-called *negative relationships* or, more precisely, *negative ties*. Quarrels, conflicts, psychological stress, physical injuries, or other negative aspects of relationships should not solely be understood as health risks. Rather, their effect depends on the context of other relationships—the entire network. Nor should the concept of negative relationships be limited to ego networks. It may be that moderating or mediating functions of the network, as formulated above, can be better understood and explained only by including negative relationships in alter-alter relationships. For example, limitations of the network due to lower income might be better described by the presence of negative relationships than by the absence of positive

relationships. There is a gap in research here, because so far not enough is known about the negative aspects of relationships. One under-researched aspect is the extent to which negative ties organize networks. Other aspects are the extent to which they are socially unequally distributed or the extent of contagion mechanisms depending on vertical dimensions of inequality. Social advancement, for example, could be presented not only as a gain from positive relationships, but also as a detachment from negative relationships. The inclusion of negative aspects of social relationships is similar to other concepts from relationship research, for example, the concept of “intergenerational ambivalence” (Lüscher & Pillemer, 1998).

Regardless of the theoretical and methodological challenges to network research just described, the following section lists gaps in *content* as described in different chapters. The contributions collected in this volume present the state of research and were clustered into different fields. One of these fields is the life course perspective, and chapters were ordered according to age, from childhood to seniority. A second field of research entails vertical and horizontal inequalities—from socioeconomic status to nation-ethno-cultural affiliation. In the next section, we will identify open questions from the perspectives of life course research and inequality research. By doing so, we hope to show the direction for future research efforts. To anticipate one major result: studies that merge health, network, and social inequality into a unified model are not available. Given that limitation, the reader may be disappointed by the fact that this volume does not present comprehensive results on these interactions.

2 Open Questions from the Perspective of Life Course Research

Before summing up the open questions from this book, we have to admit that the research we found contains several blind spots. First of all, most studies reviewed here stem from the up the war in Ukraine mostly peaceful Global North and industrialized countries, including China. Those studies, however, mostly point to the healing and compensating effect networks can have for marginalized social groups. At the same time, exclusion from health care provided by the society had a strong effect on individual health. These results gained for the industrialized part of the world certainly extend to other parts where usually less institutional health care is provided and more people live in highly segregated societies. However, not only factors of global distribution of wealth and welfare were left aside to some extent in this book, but also factors of cultural diversity. Here, a field of future research on social networks is opening—studying the interplay of social networks, SES, and cultural factors influencing individual health outcomes on a global scale. A very recent study on female sex workers in China for instance (Yuruo et al., 2021) found associations between individual values of collectivism, network parameters, and stigmatization. Smaller and more homogenous networks were associated with lesser stigmatization for sex workers, but more so for older sex workers who shared the

traditional collectivistic values. Another culture-sensitive concept influencing network structure and processes may be the so-called familism, meaning the directing role the family has for social relations and individual development in certain cultures. In a study comparing the mental health of ethnic minority and majority students during the transition to college in California, family support played a bigger role for ethnic minority students, but only if support from friends and teachers was lacking (Reis et al., 2009). With regard to the life course perspective, various authors point out in the second part of this volume that almost all known studies exclude biological factors from the models (see chapters “[Social Networks, Family Social Capital, and Child Health](#)” and “[Social Networks and Health Inequalities in Young and Middle Adulthood](#)”). This applies in particular to genetic factors, which have an effect not only in childhood but throughout life and often interact with environmental events. Such events can be directly related to networks, such as loss of central relationships or changes in network positions. This topic is largely uncharted scientific territory and requires large studies with multidimensional data. In other words, it requires complete bio-psycho-social surveys (see Sect. 5).

Furthermore, different mechanisms of social networks (see chapter “[Social Network Mechanisms](#)”) seem to be effective in different phases of life. For example, social influence in the form of direct social control (exercised by the parents) may be more significant at the beginning of one’s life compared to social contagion. Social contagion is likely to increase with the growing autonomy of the individual over the course of his or her life and possibly lose importance toward the end of life compared to social control (e.g., exercised by helpers). In order to investigate this time perspective on the dynamics of social networks, conceptual mergers of sociological network and psychological development research are needed. Within those models, phase-specific regulatory mechanisms may be assumed.

With regard to children’s networks, Daniel Lois (see chapter “[Social Networks, Family Social Capital, and Child Health](#)”) notes that in empirical research family networks are often too narrowly defined. Siblings, grandparents, distant relatives, or adopted family members are rarely included. Moreover, as family networks diversify during the course of modernization, they would benefit from the inclusion of the alter-alter edges and their formalization as negative relationships. For example, one may imagine networks of children from patchwork families that include four or more pairs of grandparents whose alter-alter relationships may be influenced by conflict-driven relationships between the respective parents, for example after divorce (see chapter “[Social Networks and Health Inequalities in Young and Middle Adulthood](#)”). Patterns of positive and negative relationships of distant relatives are relevant to the child’s health in many ways, for example, when certain grandparents (e.g., parents of the divorced partner) are excluded from the network (by the mother) because of their risky health-related behavior, but are still needed in order to provide financial or practical support. They may also be needed due to the negative relationship with the subsequent partner.

From a network perspective, the youth period of the life span is the best studied so far (see chapter “[Social Networks, Health, and Health Inequalities in Youth](#)”). Here, Irene Moor and co-authors present the largest methodologically advanced studies,

which nevertheless have some gaps in content. Most of the studies cited for adolescence are aiming at school contexts. Too often important network shares of families and extracurricular contacts (e.g., in clubs) are omitted from the studies in favor of surveying the overall network (a school has clearly defined boundaries). Since most studies have a cross-sectional design, causal statements are rarely possible. Nevertheless, relative to studies from other stages of life the studies on adolescence come closest to the goal of conceptualizing network and health inequalities together. Most studies focus on risky health-related behavior, especially nicotine use. Studies on mental health are harder to find, but are alarming and promising at the same time. Social networks, especially groups of peers, mediate between the socioeconomic status of young people and their risky behavior. However, little research has been conducted to date that examines the significance of social networks for health inequalities (aside from tobacco consumption).

The association of network and health in adulthood seems to be influenced by two factors: lifelong stabilities (such as extended networks of friends or the personality of the adult) and biographical transitions that are associated with changes in the network. Only a few of the reviewed studies analyze these relationships within the context of vertical inequalities. Some events, such as divorce, reveal the connection of transition, network, and health equality. Holger von der Lippe and Olaf Reis (see chapter “[Social Networks and Health Inequalities in Young and Middle Adulthood](#)”) list some requirements for network research. In their view, event structures (e.g., their sequence) and timing should be considered in network research, since similar events interacting at different times with other events have various effects on networks and can therefore have different effects on health. Moreover, the authors emphasize effects of secular change, which can have lasting impact patterns in adulthood with vertical inequalities playing a significant role.

For studies on older age, Britta Müller and Lea Ellwardt (see chapter “[Social Networks and Health Inequalities in Old Age](#)”) point out gaps in content and methodology. Available studies concentrate mainly on persons living in their own homes. To date, it is unclear to what extent these findings are transferable to residents of nursing homes. The effect of individual transitions on networks during the late phases of life is also an open question. Influences of health deterioration and functional losses are to be expected for that period. Previous studies have analyzed the connection between socioeconomic status (SES), health, and social network with depression or functional and subjective health. However, the question of whether interactions with SES and social network also occur in dementia and pain-associated diseases has yet to be clarified. The authors emphasize that complex research designs including social networks in old age should be preferred to investigate the relationship between SES, health, and social network. Purely quantitative or qualitative instruments are less suitable. Up to now, network characteristics in gerontological research have usually only been measured indirectly via a proxy. Established methods of network analysis provide a potential option that should be used much more for future research on the elderly.

3 Open Questions from the Perspective of Inequality Research

In the third part of the volume, the authors approach network research from the perspective of inequality research. For studies on social status, Nico Vonneilich (see chapter “[Social Status, Social Relations, and Health](#)”) states that there are hardly any studies that link macro-social, micro-social, and individual processes together in multi-level models. Within a few studies only these levels are connected with each other, and socio-structural factors for the creation of stable social networks are taken into account and related to health. Since there are hardly any relevant studies with comprehensive sets of indicators on social networks, the author recommends the re-analysis of existing data sets, such as the SHIP study. However, secondary data are often afflicted with measurement problems either at the health or network level. Gerhard Krug et al. also deplore the lack of studies showing networks in their impact on health inequalities for the relatively well-studied inequality after the transition to unemployment (see chapter “[Unemployment, Social Networks, and Health Inequalities](#)”). This lack is all the more regrettable as good evidence of network-based mediator and moderator effects has been produced for this event. For this topic, processes related to time and timing can hardly be described due to the extensive lack of longitudinal studies.

With regard to mental health, in particular, it is difficult to differentiate between cause and effect, since most studies rely on selected samples. Such “downward spirals,” in which smaller networks and poorer health conditions follow each other, have so far only been shown to a limited extent, for example with single parents (see chapter “[Social Networks and the Health of Single Parents](#)”). As for unemployment, evidence for single parents points to the buffering effects of functional networks; however, differentiated analyses are lacking. Sylvia Keim-Klärner lists various approaches that could fill this gap. She differentiates between longitudinal, cross-sectional, and qualitative analyses. She considers the inclusion of negative relationships and relationship content as promising to increase knowledge and to do justice to the complexity and ambivalence of relationship configurations and interactions.

On the subject of gender (see chapter “[Gender and Health Inequalities: Social Networks in the Context of Health and Health Behaviour](#)”), a central dimension of inequality in the current social science discussion, Markus Gamper and co-authors state that research focuses almost exclusively on the two gender identities: “man” and “woman.” In the course of the social debate on gender identities and the decision of the German Federal Constitutional Court in 2017, which obliges legislators to provide a third option (“diverse”) for inter-gender persons in birth and population registers, more attention could be paid to the health situation of persons with other gender identities (McDermott et al., 2021). Relatively little is known about their health situation to date, partly because of the difficulty of recording this group in representative surveys (Reisner et al., 2016). While research on gender effects focuses particularly on the youth and elderly, the other phases of life tend to remain underrepresented. Methodologically, research in this area is relatively well

developed, and there are a large number of quantitative network studies, including longitudinal studies, using SIENA models. Yet, qualitative network research or visual network methods that would be particularly suitable for uncovering the mode of action of social networks (see chapter “[Social Network Mechanisms](#)”) can hardly be found. Further development in this area would be worthwhile.

Compared with the unemployed or single parents, people with disabilities are a group that is largely neglected by network research (see chapter “[Social Networks and Disability: Access to and Stabilization of Integration into the Primary Labor Market](#)”), although for instance in Germany they represent one-tenth of the total population. This gap is all the more important because people with disabilities influence the maintenance and formation of networks and employment relationships. In addition to institutional actors, many other factors play a role in keeping this group healthy. These factors, however, were rarely linked to network parameters (such as regional accessibility). Furthermore, Stefan Zapfel and co-authors also point to the changing importance of different institutions.

Health risks regarding migration and (multiple)nation-ethno-cultural affiliation and associated network mechanisms are explained via different models, such as the “Healthy-migrant” hypothesis (see chapter “[Migration as a Health Inequality Dimension? Natio-Ethno-Cultural Affiliation, Health, and Social Networks](#)”). Those hypotheses, however, are hardly pursued in research methodology. Moreover, other dimensions of inequality, such as economic status or cultural capital of migrants, are rarely modeled. Migration, however, sets up a most interesting field wherein the interplay of inequalities, cultural factors, and social networks should be investigated on a global scale, not only for the industrialized countries or welfare states. According to Annett Kupfer and Markus Gamper, there are considerable methodological gaps in the recording of migrant networks when it comes to women. Furthermore, there are almost no longitudinal studies or studies with comparison groups. Negative relationships (edges), which are marked by hostility, discrimination, or racism, for example, are not surveyed as part of migrant networks, nor are welfare state or other institutional nodes. Finally, there are hardly any studies that link health, networks, and migration.

The authors of the third part of the volume agree that the *mechanisms* of network influence are rather presupposed than investigated. Various hypotheses are possible, such as the loss of *integration* into the group of colleagues after the transition to unemployment or the connection between support, negative relationships, and homogeneity in the network among single parents. For all inequalities, it is true that in modern welfare societies, institutions play a decisive role in the success of networking—for example, job centers in the case of unemployment, family helpers for single parents, integration helpers for disabled people, and migration services for migrants. Private and institutional relationships are intertwined here, but their interaction has hardly been investigated so far (see Kupfer, 2015). Interesting hypotheses can also be formed regarding this interaction. In essence, studies of this kind address modes of action of the modern welfare state. For example, institutional and private support could be mutually supportive or could compete (similar to the thesis on interrupted dyads in the development of friendships after

transition to partnership; see chapter “[Social Networks and Health Inequalities in Young and Middle Adulthood](#)”). The different interactions could possibly be explained by the strength of the respective relationships. When state and private support are intertwined, it remains questionable whether such networks actually connect to each other or whether defined boundaries (e.g., between state and private relationships) remain within *hybrid network constructions*. Such hybrid constructions, in which private and institutional network parts are intertwined but are kept separate, would benefit greatly from the introduction of edge-specific mechanisms (e.g., support in weak institutional relationships, infection in strong proximal relationships) as well as from the inclusion of negative relationships (e.g., the mistrust of single parents toward the youth welfare office with simultaneous dependence on institutional support). If the idea of extensive network research and its extension to social institutions is pursued further, it is unclear whether network hierarchies and structures can be represented, for example as “networks within networks.” A proposal for such structures was presented by Reis (2017) when he described families in the German Democratic Republic (1949–1989) as “niches” within the communist totalitarian state.

4 Life Course, Inequality, Network, and Health: Some Hypotheses

It must be said that the integration of the life course perspective and inequality research for social networks and health is lacking for the most part. It is necessary to understand network changes across life phases as health risks and resources that are either consequences (mediation) of social inequalities or influence their impact (moderation)—here a new research area awaits development. With the expanded network perspective, as presented throughout this book, many previously hypothesized connections could be examined, for example:

- Success makes one lonely and then sick, but only if one comes from a socially lower class and starts to progress into adulthood.
- Keeping young people healthy is largely due to the relationship work of their parents, for example, by parents interrupting negative relationships (e.g., by moving away from a high-risk neighborhood), but only those who have sufficient resources can do this.
- Alter-alter ties, i.e., relations between others in one own’s network, are more important for giving access to better quality healthcare resources in networks of more affluent classes compared to networks of poorer ones. This mechanism works already early in life, that is, for the children of more affluent parents.
- The lack of willingness to provide care to the elderly is often the result of negative past relationships, with “poorer old people” being more severely affected than more affluent ones.

- Risk behavior is suitable for improving the position within the network (e.g., centrality), but only if the whole network contains no other chance for comparison, for example, if other network participants (nodes) are better equipped financially. Such network mechanisms are limited to the youth, because for older age groups social networks become more homogenous.

5 Outlook: Requirements for Future Research

For the formulation of desiderata for future research, we return to the model presented at the beginning of this book (see chapter “[Social Networks and Health Inequalities: A New Perspective for Research](#)”) and assign our conclusions to the levels of analysis described there.

For the *top model level* in Fig. 1, the demand that social inequalities should be a *conditio sine qua non* of health research still applies. The increasing average prosperity of Western industrialized countries is currently associated with increasing social inequality (Alvaredo et al., 2018), with both increases having an impact on health. The social change toward a digital knowledge society and economy (Reckwitz, 2017) as part of the “runaway world” (Giddens, 1999) includes considerable risks for inequality, detachment, and flexibilization. The transformation of these risks into chances requires high individual investments, including investments into functional networks. Categories of inequality, both horizontal and vertical, perhaps become more dynamic in digital economies. Mobility, both social and spatial, requires social capital, the inclusion of which in health prediction models should become a standard.

The objectification of social capital requires the most accurate measurement of social networks (*model level 2* in Fig. 1). The inconsistent and, in some cases, inappropriate measurement of social networks was a point of criticism expressed in all contributions in this volume. Some demands on network research compiled from the individual chapters that could improve the meso-foundation of health include the following:

- The network analysis should go beyond the recording of the type and number of contacts and should allow statements about the structural level that include parameters such as density, homogeneity, centrality, cliques, or structural holes.
- The network should contain more detailed information about the alters and their properties, both as newly generated nodes (by actor generators) and through their relationships (alter-alter edges).
- Basically, relationships (edges) should not only have health-promoting aspects (in the sense of support or social capital), but also negative, health-damaging aspects. Negative relationships are likely to reduce health-related capital. They may occur both close to the individual and far from it. Negative ties can have a direct effect on the ego or affect alter-alter relationships. Finally, relationships can

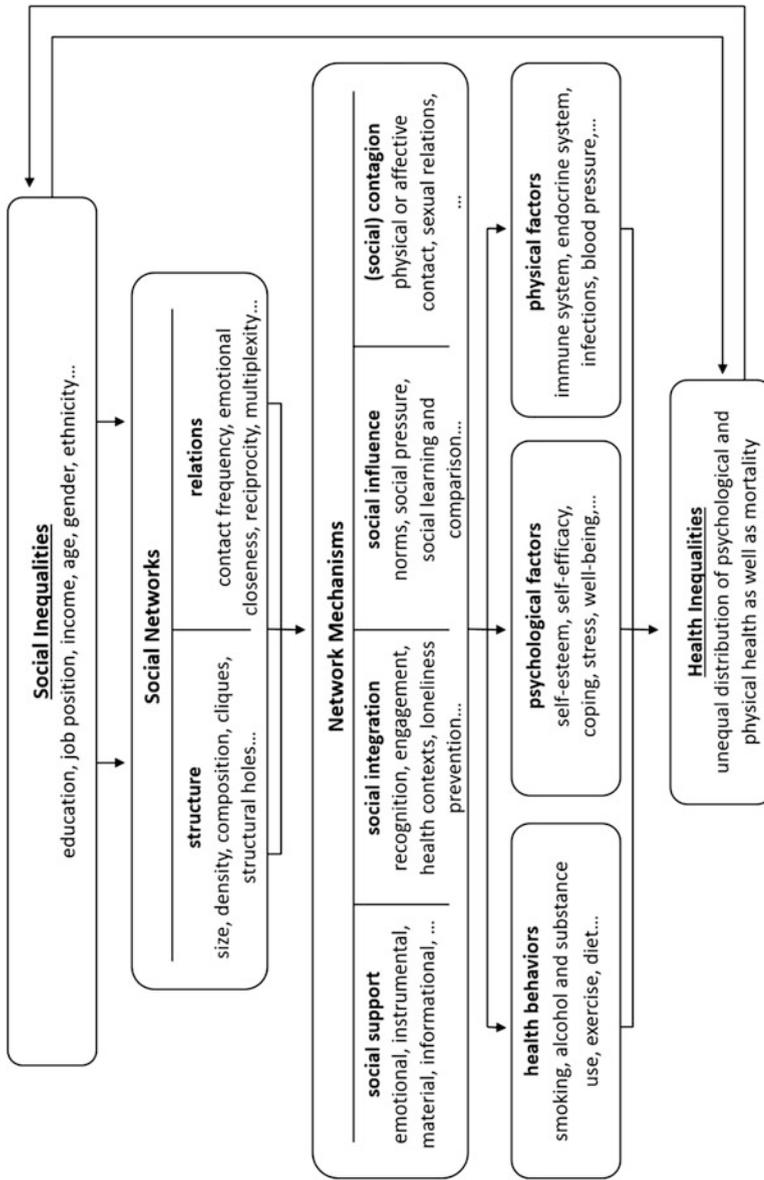


Fig. 1 Repetition of the summarizing theory model on social inequalities, social networks, and health inequalities (see chapter “Social Networks and Health Inequalities: A New Perspective for Research”). Source: Own representation, based on: Berkman and Glass (2000), Elkeles and Mielck (1997), and Dahlgren and Whitehead (1991)

be simultaneously supportive and burdensome and should not be reduced to a (single) function.

- The measurement of social networks should be as similar as possible for different contexts, with regard to space and time. By (social) space we mean dimensions like urban-rural, work-leisure, offline-online, or migration events. Framing concepts, such as “family” and “health,” depend on cultural definitions and belong here. Spatial dimensions also describe event-related changes in social space, for example after unemployment or changes in the life of someone with a disability. Different time contexts refer primarily to age- and life course-related network changes. In the chapters of the second part of this volume, it was shown that different ages are not only associated with different event structures, but also with different individual preconditions for the shaping of networks. Roughly speaking, the individual construction of the network over the life course has the shape of an inverted U, whereby both expansion and activity parameters change over the life course. Spatial and temporal contexts of network acquisition are mutually inter-related. For example, “untimely” transitions, that is, transitions that are not adapted to the social norms of time, such as premature parenthood, make it less likely that certain social spaces, such as the university, will be entered. Similarly, the lifelong risks of transitioning into unemployment vary depending on when and how often this transition takes place and within what length of time. Late transitions into unemployment seem to be more problematic than transitions early in life.
- If the concept of reciprocity gets used consequently for social relationships, it is also possible to relate network changes that occur far apart during the life course. For example, late unemployment among parents leads to the end of their lives at work and also to increased investment in their own children and grandchildren, which in turn possibly make health-promoting effects of the family network or support in old age more likely.
- It cannot be assumed that networks only affect passive individuals in top-down mechanisms. Individuals change networks as soon as they encounter them, whether consciously, strategically, or unconsciously. That means networks are also subject to bottom-up “couplings” and selection effects. The active contribution of the individual (e.g., through individual sociability or individual networks) is an important additional variable that needs to be controlled for.
- An ideal network measurement should take into account that networks probably operate through different mechanisms (model level 3 in Fig. 1). Even if all of the mechanisms discussed by Klärner and von der Lippe (see chapter “[Social Network Mechanisms](#)”) will be difficult to map in a single study, a distinction should nevertheless be made between social support, inclusion, influence, or contagion effects. For this purpose, short scales, such as the Oslo Social Support Scale (OSSS) (Dalgard et al., 2006) or the F-SozU K-14 and F-SozU K-6 (Kliem et al., 2015), are available in validated form. While the OSSS records social support with three items, in the F-SozU K-14 three items also describe the social integration of a person.

- In the future, offline mechanisms should be examined in their interrelation with online mechanisms. Mechanisms vary from pure macro strategies, such as the notorious Facebook experiment that attempted to reveal whether the emotional state of users can be manipulated by selecting the news reports displayed in the news feed (Kramer et al., 2014; Kleinsman & Buckley, 2015), to micro-systemic on/offline-switching behavior, such as the transition from (cross-class) multiplayer game networks to offline friendships. The biggest industries of modern times have emerged in the meso-systemic area of social networks. The business concepts of those industries are closely linked to network mechanisms, such as inclusion, social influence, or contagion. Machine intelligences or algorithms that do not always reveal themselves as such constitute important nodes in these networks. Thus, future network studies should also benefit from research on human–human–machine interactions (e.g., in the case of health apps shared by partners) or from research on deceptive communication.

Here, various hypotheses can be built about the mechanisms by which social networks “couple” to proximal, that is, micro-founded, factors of health. As far as the measurement on this *fourth model level* from Fig. 1 is concerned, a revolution is currently taking place here, and future network research will have to be oriented toward it. Without elaborating further on this idea, it should be pointed out that, for example, health-related behavior can be highly objectified via so-called EMAs (ecological momentary assessments) of, for example, psychophysiological parameters (Rough et al., 2019). Mental and physical markers, from skin conduction resistance, blood pressure, and brain activity to the current gene expression for the formation of the sleep-controlling hormone melatonin, are becoming more and more accessible in the course of increasingly complex analyses in the health sciences and can be recorded in dynamic ways (changing in time and place). The patients of the future must be understood in many ways as “connected,” meaning that offline and online relationships are among the “driving forces” in “digital psychiatry” or “e-health” (Bughra et al., 2017, p. 799).

A substantial change is ongoing on the fifth level of our proposed theoretical model, called inequality in mental and physical morbidity and mortality. This change regards measurement processes and more. For example, definitions of “diseases” are changing with the introduction of new coding systems, such as the expected replacement of the ICD-10 with ICD-11. Increases or decreases in the prevalence of diseases may also be due to macro-systemic changes in attribution. Healthcare costs, such as those provided by the European Brain Council for brain-associated disorders (<https://www.braincouncil.eu/>), and their distribution should be included in the modeling of social and health inequalities. Thus, whether and how the functions of networks differ within healthcare systems financed by insurance companies, tax revenues, or private capital or combinations of these is a question for research.

6 Network and Health Inequalities: Hot Topics

Here, we would like to list a few topics that we would have liked to discuss in this volume, but for which there was no time, no space, or no author to be found. Like Christakis and Fowler (2011), we believe that networks are a *universal* agent of human development and thus of health. The following list therefore does not follow a systematic approach, but only describes some wishes and ideas of the researchers involved in the volume.

6.1 *Commuting, Online and Offline Networks, and Social Class*

The considerable flexibilization of the labor market in all sectors, the increasing proportion of temporary employment, and the expansion of the low-income sector are associated with increasing intra- and international labor migration, which exceeds the mobility of families and *convoys of life* (Ceccagno & Sacchetto, 2020; Wrzus et al., 2013). A growing number of work commuters increasingly spend time far away from offline networks. The duration of work stays is often too short to build up offline networks at remote places. Here, for example, one could ask to what extent the health risks associated with commuting or short-termed migration are moderated by online networks, how spatial and social mobility are linked, or how timing effects, network, and social status are related. The balance of online–offline contacts may vary depending on social status, for example, if manual seasonal workers (e.g., harvesters) have fewer resources to see their families regularly compared to better-off temporary employees from the IT industry.

6.2 *Mental Illness, Online and Offline Networks, and Social Class*

In principle, mental illnesses are highly associated with dysfunctional social relationships, whereby various directions of association could be adopted for development, chronification, or therapy of disorders. Moreover, the long-known associations between social class and psychiatric diagnosis (Hollingshead & Redlich, 1958) have rarely been the subject of scientific research in recent years and deserve to be revived in the context of network analysis. A practical example from therapy will illustrate this demand.

Usually, mental illness is only treated with the consent of the patient. The relative isolation (from risky social contexts) is an essential component of many inpatient therapies. However, the general electronically mediated networking across space and time boundaries has become so much a part of everyday life that many patients agree

to inpatient therapy only if they must not refrain from networking. Therefore, many clinics allow communication with the “outside world” (mobile phone time), at least temporarily, which might pose a risk to the success of therapy. For example, the therapy of non-suicidal self-injurious behavior is sometimes thwarted when patients are confronted with the narratives of non-patients and images of slashed forearms via WhatsApp. Thus, several questions can be asked here, for example: how can psychotherapy succeed under conditions without interrupted dyads, how can the effects of negative relationships be minimized, or how can therapy be improved by including disease-relevant platforms? Similar to the findings for adolescent smoking behavior, it could be assumed that adolescents with lower social status are more often confronted with risky behavior in their networks because their networks are less homogenous. For example, it should be investigated as to whether so-called Werther or Papageno effects (social infection of suicidal behavior or suicide preventive behavior) have different effects in different social strata. It was shown, for example, that media role models, mediated via offline networks, have an effect on suicidal behavior of adolescents (Abrutyn & Mueller, 2014), without health inequalities having been investigated so far. In the sense of the classic study by Hollingshead and Redlich (1958), the question as to whether status-dependent access to the psychiatric help system is moderated or mediated by network functions remains open.

6.3 Poverty, Health, and Institutional Network Relations

Institutions and professional helpers can be important actors or nodes in a network, especially for people at risk of poverty (Klärner & Knabe, 2019). Within those networks, they cannot only improve well-being, but may also have a stronger health-relevant effect, for example, by bringing preventive or curative measures to the person. The socially unequal distribution of access to support systems may reinforce (or mitigate) health-related inequalities depending on the place of residence and local opportunities. Institutional helpers are actors of the welfare state fighting poverty (Paugam, 1998), and they may or may not be accessible. The question to be asked here is in what ways these actors work within a social network, for example, whether they influence relationships with other actors. Another research question might be which network structures support the receivers’ autonomy, or if they, in contrast, tend to create dependencies and thus have a more detrimental effect. For the latter case, the hypothesis would be that detrimental professional support sparks investments into more informal networks.

6.4 *The Spatial Dimension of Social Networks: Health and Social Networks in Rural Areas*

Social networks also have a spatial dimension: in order to establish direct interpersonal contacts and interactions with friends, acquaintances, institutional helpers, doctors, and so forth, or to make use of certain health-related services in clinics, pharmacies, or emergency facilities, a spatial distance usually has to be covered. Accessibilities to healthcare institutions and service providers are spatially and socially distributed unequally (Neumeier, 2016). The question arises what kind of effects is produced by the absence or poor accessibility to these institutionalized nodes in the network. Another question is whether other areas of the network can compensate this inaccessibility. It might well be that the absence of face-to-face services can be replaced and supplemented by new digitalized services. The consequences of the unequally distributed *health literacy* in this context must also be considered. Approaches to capitalize on network analytical methods in this context and to reconstruct a form of *spatial capital* were presented at a session organized by SoNegU at the Sunbelt Social Network Conference (Galaskiewicz et al., 2016).

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