

# Social Networks and Health Inequalities in Young and Middle Adulthood



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## 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.<sup>1</sup>

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.

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<sup>1</sup>Here, 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 divorces<sup>2</sup> 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.<sup>3</sup> 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).

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<sup>2</sup>We 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.

<sup>3</sup>There 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.”<sup>4</sup> 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.

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<sup>4</sup>This 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

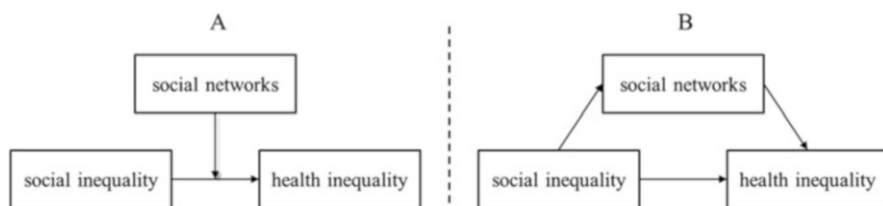
ties after adult children left the family. In that sense, a functional parental partnership during the empty nest period meant that fathers partly took back on the role children had for facilitation of social ties before they left the household. The economic risks generally associated with divorce are 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,<sup>5</sup> 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.<sup>6</sup> 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

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<sup>5</sup>This 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.

<sup>6</sup>If, 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

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

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