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Social Capital and Health

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Introduction

The idea of social capital has a long history in the social sciences. Its intellectual origin is under debate. Some quote sociological predecessors, including Emile Durkheim, Talcott Parsons, Karl Marx, Frederick Engels, Max Weber, and Georg Simmel (Portes and Sensenbrenner 1993). Some cite economists, such as David Hume, Edmund Burke, and Adam Smith (Woolcock 1998). Others name philosophers such as John Dewey (Farr 2004). According to Putnam (2000), the term social capital first appeared in a 1916 article by Lyda Judson Hanifan, an education reformer.

Despite competing claims to its nativity, social capital has grown into a popular paradigm during the last three decades. As is the case with new concepts, it has triggered extensive debates due to its diverse definitions, which inevitably result in controversial operationalization, divergent measurement, disparate mechanisms, mixed evidence, various implications, and arduous challenges. A general consensus does exist on the four key figures who popularized this concept and stimulated its theoretical development during the 1980s and the early 1990s, including three sociologists, Pierre Bourdieu (1986 [1983]), Nan Lin (1982, 2001), and James S. Coleman (1988, 1990), and one political scientist, Robert D. Putnam (1993, 2000).

Social capital as a theoretical tool has gained burgeoning acceptance in the health sciences. A search of the Web of Science for articles with "social capital" and "health" in their topics showed an accelerating popularity from the middle 1990s (see Figure 7.1). There was only one such article in 1994. But the number rose to 25 in 1999, jumped to 224 in 2009, and remained above 540 in 2018 and 2019. Despite its substantial development, this literature is dominated by Putnam's notion partly because of its political implications and quick measurements in secondary data (Foley and Edwards 1999). The original contributions of sociological theories have been relatively understated but increasingly appreciated and extended (Moore et al. 2005; Pevalin 2003; Song 2013a; Song, Son, and Lin 2010; Webber and Huxley 2004).

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In this chapter, our goal is to provide a selective review and highlight social capital as a significant social antecedent of health from a sociological perspective. We first introduce social capital concepts advanced by Bourdieu, Lin, Coleman, and Putnam. We then turn to the theoretical extension and empirical

application of these four approaches to health. We conclude with challenges and future research directions. Social capital is one of the most acknowledged contributions from sociology to social science and public discourse during the last three decades (Portes 1998). Considering its intrinsic sociological nature, sociologists should play a crucial role in further refining social capital and its relationship with health.

Social Capital: Four Theoretical Approaches

Bourdieu: Exclusive resources from durable networks

Bourdieu pioneered in theorizing social capital. He introduced it in his French version of *Distinction* in 1979 (Adam and Rončević 2003; Bourdieu 1984), and published his theory in a chapter in French in 1983 and later in English in 1986. He defines and distinguishes social capital from its sources and returns in the forms of other types of capital at the individual level, and emphasizes its cross-space network embeddedness and exclusive nature. However, he lacks attention to its operationalization and measurement.

Contending that the unequal distribution of capital determines the production and reproduction of social structure, Bourdieu identifies three essential forms of capital: economic, cultural, and social. Economic and cultural capital are personally owned. Social capital is embedded in social networks. It is "the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition – or in other words, to membership in a group – which provides each of its members with the backing of the collectivity-owned capital, a 'credential' which entitles them to credit, in the various senses of the word" (Bourdieu 1986 [1983]: 248–9). Its volume depends on two elements: network size and network members' (alters') capital.

Sources and returns of social capital are the other two forms of capital. Stratification is reproduced through the conversion between the three forms of capital. Despite such convertibility, social capital exerts its independent effects. "These effects, in which spontaneous sociology readily perceives the work of 'connections,' are particularly visible in all cases in which different individuals obtain very unequal profits from virtually equivalent (economic or cultural) capital, depending on the extent to which they can mobilize by proxy the capital of a group (a family, the alumni of an elite school, a select club, the aristocracy, etc.) that is more or less constituted as such and more or less rich in capital" (1986 [1983]: 256).

Networks of relationships are based on "material and symbolic exchanges" and spread across diverse contexts including physical, economic and social space. Their establishment and maintenance requires "investment strategies, individual or collective," one of which is social exclusion. Social institutions legitimate within-group exchanges and exclude members whose mistakes threaten group interests.

Lin: Resources embedded in social networks

Lin provides his fully developed theoretical scheme on social capital in a book (2001), which builds upon social resources theory he developed in the late 1970s and early 1980s (1982). He grounds his definition in the tradition of personal capital theories (e.g., Marx's capital, human and cultural capital). He typologizes

social capital, offers falsifiable operationalization and measurement, and theorizes its structural and networking sources, mechanisms, and instrumental and expressive returns at the individual level.

Lin defines social capital as "resources embedded in a social structure that are accessed and/or mobilized in purposive actions" and operationally as "resources embedded in social networks accessed and used by actors for actions" (2001: 25, 29). In contrast with personal capital as resources individuals (egos) control, social capital is resources (e.g., wealth, power, reputation, and social networks) alters (including alters in cyberspace) possess and ego can gain access through direct or indirect ties. It has two types: accessed (resources available from alters) and mobilized (resources from alters ego uses). Assuming that alters' resources hinge upon their positions in the hierarchical social structure, Lin and colleagues developed a position generator to map alters' or accessed status (Lin and Dumin 1986; Lin, Fu, and Hsung 2001). This instrument asks ego to identify alters associated with a sample of occupations salient in a society. Lin stresses three dimensions of accessed status: extensity (the size of different positions alters occupy), upper reachability (alters' highest position), and heterogeneity (the status range between alters' highest and lowest positions). Accessed social capital can also be measured as status of alters ego discusses important matter with using the name generator and as the total kinds of concrete resources available from alters using the resource generator (Burt 1984; Song and Chang 2012; Van der Gaag and Snijders 2005). Mobilized social capital is indicated by status of alters ego uses.

Lin proposes two sources of social capital: structural and networking (2001). Structural sources include ego's prior hierarchical roles or positions, both ascribed (e.g., gender, race/ethnicity, family origins) and achieved (e.g., socioeconomic status or SES). Networking sources refer to network locations (weak ties and closeness to social bridges). Ego's positions and network locations positively affect social capital. Their positive effects are moderated by three macro-level structural factors (the number of hierarchical levels and the equal distribution of occupants and resources across levels) respectively in negative and positive directions. Besides, collective assets such as trust and norms can either foster or restrict social capital.

Lin lists four mechanisms (information, influence, social credentials, and group identity) for instrumental (e.g., wealth, power, and reputation) and expressive (e.g., health and life satisfaction) returns to social capital. He recognizes that the two forms of returns fortify each other but his theory focuses on instrumental returns. The two forms of returns depend on tie strength. As Lin argues, social capital derived from weak ties creates more instrumental returns, while that embedded in strong ties produces more expressive returns. He criticizes Bourdieu and Coleman for their emphasis on exclusive or closed networks.

Social capital and macro-level "institutional fields" influences each other (Lin 2001). On the one hand, an institutional field regulates and constrains its members' access to and use of social capital by legitimating certain norms of social interaction. On the other hand, members can establish alternative norms and transform the existing institutional field through activating and mobilizing social capital.

Lin's initial efforts were geared toward an individual-level analysis. He later extends his theory to the macro level (2008). He distinguishes two forms of social capital for a collectivity (e.g., associations,

organizations, communities, regions, or nation-states): internal (resources provided by its members, and external (resources from other collectivities).

Coleman: Functional social-structural resources

Coleman's article on the role of social capital in the creation of human capital called multidisciplinary attention to this term (1988). Then, he devoted one chapter to analyzing social capital, including a functionalist definition, diverse operationalization, and structural and networking sources (1990). He emphasizes its positive function as a public good at the collective level.

Coleman defines social capital by its function. "It is not a single entity, but a variety of different entities having two characteristics in common: They all consist of some aspect of a social structure, and they facilitate certain actions of individuals who are within that structure. Like other forms of capital, social capital is productive, making possible the achievement of certain ends that would not be attainable in its absence" (1990: 302). He justified his broad functionalist definition by its utility in explaining multiple outcomes and bridging the micro- and macro-levels.

A catch-all definition leads to diverse operationalization. Coleman lists six forms of social capital: 1) obligations, expectations of reciprocity, and trustworthiness, 2) information potential, 3) norms and effective sanctions, 4) authority relations, 5) appropriable social organizations, and 6) intentional organizations (1990). He hesitates about the value of social capital as a quantifiable concept. In his work on dropout rates (1988), he measures family social capital as the presence of parents, the number of siblings, and mother's expectation for child's education and community social capital as the presence of religiously based high schools and students' religious attendance.

Coleman discusses five structural and networking sources of social capital: network closure, stability of social structure, altruistic and collectivistic ideology, affluence, and government support (1990). The first three factors increase social capital but the other two factors do the opposite. He maintains that social capital has positive functions at both individual (as a private good) and collective levels (as a public good). But he emphasizes its public good aspect. He briefly mentions the importance of social capital as patient-doctor trust for access to medical care. He also recognizes that social capital can have negative functions (e.g., effective sanctions may constrain certain actions).

Putnam: Facilitating features of social organization

Putnam's work on social capital and democracy appeared in 1993. His 1995 article, "Bowling Alone," and its expansion into a book of the same main title in 2000 popularized the term social capital beyond the academic community. Drawing upon Coleman's work, he proposes a functionalist definition and diverse operationalization. He constructs a state-level index and discusses structural sources. He typologizes social capital and underlines its public good aspect.

Putnam defines social capital initially as "features of social organization, such as trust, norms and networks that can improve the efficiency of society by facilitating coordinated actions" (1993: 167) and

later as "connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them" (2000: 19). Social connections can be formal (e.g., memberships and participation in formal organizations and activities) and informal (e.g., participation with family, friends, and neighbors in social and leisure activities). The norms of reciprocity and trust can be specific and generalized and the generalized aspect is Putnam's focus. He develops a state-level social capital index, containing 14 items covering areas such as community organizational life, engagement in public affairs, community volunteerism, informal sociability, and social trust. He observes an overall decline of social capital in American society and attributes that decline to multiple factors, such as time and financial pressure, suburbanization, electronic entertainment, and generational change. He doubts the potential of small groups, social movements, and telecommunications including the Internet to offset that decline.

Putnam distinguishes two types of social capital: bonding (exclusive) and bridging (inclusive) (2000). The former exists in relationships connecting homogeneous individuals and the latter relationships linking heterogeneous persons. The former enhances within-group reciprocity and solidarity, and the latter helps obtain external goods from outside groups. He warns that the former can create between-group enmity. Lin criticizes Putnam's typology from a strict social network perspective, arguing that bonding and bridging are properties of social networks instead of social capital (2008).

Similar to Coleman, Putnam thinks of social capital as both a private and a public good but emphasizes the latter (2000). He discusses its positive functions in various areas including education and children's welfare, neighborhood safety and productivity, economic development, health and happiness, democracy, and tolerance and equality. He also mentions its negative functions in terms of its use for corruption, sectarianism, ethnocentrism, and antisocial behaviors.

Summary: A tale of two schools

All the four scholars agree that social capital is resources derived from social relationships and operates net of other forms of capital. However, their definitions and operationalization diverge from one another. Their work exemplifies two schools of theoretical perspectives: the network-based conflict perspective of Bourdieu and Lin, and the normative (or communal) functionalist perspective of Coleman and Putnam.

Bourdieu's and Lin's network-based conflict approaches are more refined and precise, distinguishing social capital from its antecedents and yields for individuals (Adam and Rončević 2003; Cook 2005; Portes 1998). They treat social capital as a scarce asset with social networks across multiple spaces as its preconditions. They stress its role in the production and reproduction of social stratification, and theorize inequalities in its access and returns. They highlight the conversion between personal advantages, in particular personal capital, and social capital. Their work differs in three ways. First, Lin applies a stronger network perspective and develops a network instrument to measure social capital, while Bourdieu lacks attention to operationalization and measurement. Second, in the creation of social capital, Bourdieu underlies durable ties, network closure, and social exclusion, while Lin weak ties and network bridging. Third, Lin analyzes the links between micro-, meso-, and macrostructures of society.

In contrast, Coleman and Putnam apply a normative functionalist perspective. They provide broad definitions and diverse operationalization. Putnam's three forms of social capital overlap with the six forms Coleman identifies. Their proposed measurement captures social integration or social cohesion but not social networks. They emphasize social capital more as a public good. They mention its negative functions in terms of its misuse and unintended consequences. Their work receives more critiques. Their tautological arguments of social capital as both a cause and an effect mingles social capital with its sources and outcomes (Lin 2001; Portes 1998). Their diverse forms of social capital operate through different mechanisms and influence each other in unclear causal orders. Such "everything but the kitchen sink" conceptualization creates difficulties for theoretical development and empirical research (Cook 2005). In addition, some critics argue against specifying trust and norms of reciprocity as subjective components of social capital (Cook 2005; Foley and Edwards 1999; Portes 1998; Lin 2001). They maintain that social capital is neutral, objective, and rooted in social relationships, which contributes to its unique heuristic values. Next, we review the applications of each approach in the health literature.

Social Capital and Health: Theoretical Development and Empirical Evidence

Bourdieu: Controversial applications

The theoretical utility of Bourdieu's work for health has been increasingly recognized. Applications of his work, however, are controversial. Scholars adopt different parts of his theory and operationalize and measure social capital in inconsistent ways, many of which reflect Coleman's and Putnam's approaches.

Ziersch underlines Bourdieu's notion of social capital as individual resources and decomposes it into sources (informal and formal networks, and values such as trust, reciprocity, and safety) and outcomes (help, acceptance, civic actions, and control) (2005). Her community study in Australia shows inconsistent associations between neighborhood-based social capital indicators and physical and mental health.

In contrast, Carpiano treats Bourdieu's notion as neighborhood resources with Putnam's idea as a precondition (2006). His model lists four forms of social capital (neighborhood organization participation, informal social control, social support, and social leverage) and neighborhood attachment as a moderator. His community study in Los Angeles finds inconsistent associations between social capital indicators and health behaviors and general health and inconsistent moderating effects of neighborhood attachment (2007).

Stephens credits Ziersch and Carpiano for disentangling sources and outcomes of social capital (2008). However, she criticizes them for departing from Bourdieu by constraining attention to geographical locations, omitting broader social issues on social inequalities and social exclusion, and measuring social capital as existing concepts using secondary quantitative data. Her qualitative interviews in New Zealand show social connections beyond neighborhoods, unequal access to social connections between the deprived and non-deprived, and people's competition for valuable connections and other resources including health services.

Some scholars apply Bourdieu's typology of capital. A community study in England examines economic and social capital (low sense of loneliness, desire to move, meeting with neighbors, and sense of

community), and finds that economic capital and one social capital indicator (low sense of loneliness) have independent negative associations with psychological morbidity (Gatrell, Popay, and Thomas 2004). A community study in Canada captures social classes based on economic, cultural, and social capital (trust in community members, trust in politicians, sense of community, low sense of loneliness, networking with neighbors, volunteerism, voting, and voluntary membership) and reports a positive association between social classes and health conditions (Veenstra 2007). A community study in Belgium demonstrates the positive associations of the three forms of capital with general physical and mental health but results vary by the two indicators of social capital (neighborhood social cohesion and social support) (Pinxten and Lievens 2014). A study of 15 European countries shows the positive association of social capital (number of social activities) with health care utilization net of economic and cultural capital (Paccoud, Nazroo, and Leist 2020).

Some scholars propose capital interplay theory based on Bourdieu's capital conversion argument (Veenstra and Abel 2015, 2019). They identify three types of capital interplay: acquisition (one form of capital generates another), transmission (one person's capital contributes to another person's), and multiplier (one form of capital multiplies the effect of another). Their study of young men in Switzerland supports only the capital acquisition argument. Parents' objectified cultural capital and economic and social capital (ties to influential people) mediate the association between their institutionalized cultural capital and young men's general health (Veenstra and Abel 2015). Opposite to the capital multiplier argument, the positive association between institutionalized cultural capital of young men and their health is stronger when parents have lower institutionalized cultural capital and social capital. Compensatory capital interplay is proposed as the explanation.

Lin: Rigorous applications and extension

Lin's approach is stricter and more fully developed, which facilitates its methodological and theoretical growth and empirical applications in the health literature. The methodological growth is the refined measurement of social capital. The theoretical growth includes coherently articulated mechanisms, the integration of his theory with other theories, challenges to its assumptions, and the emergence of its competing theory, social cost theory.

Lin operationalizes accessed social capital as accessed status. The concept of accessed status and its measurement has been expanded. Song provides a binary typology: absolute (alters' status) and relative (alters' status relative to ego's) (2015a). Lin's work examines the former. Song uses diversity and extensity respectively to refer to Lin's idea of extensity and heterogeneity (2012). Apart from diversity, extensity, and upper reachability, two more attributes of absolute accessed status are examined in the health literature: average and lower reachability (alters' average and lowest status) (Song 2011, 2015a; Song and Chang 2012). In contrast, relative higher or lower accessed status is objectively calculated as the size and proportion of alters' positions ranked higher or lower than ego's and subjectively measured as ego's perceived lower or higher status relative to alters (Song 2015a, forthcoming; Song and Pettis 2018).

Diverse mechanisms are proposed for the protective health effect of alters' resources, including 1) influencing macro-level health policy decision-making, 2) advancing objective or SES attainment, 3) promoting subjective status attainment, 4) providing social support, 5) facilitating help seeking, 6) encouraging healthy norms and lifestyles, 7) improving access to health care and insurance, 8) acting as social credentials, 9) decreasing stress exposure, 10) reinforcing psychological resources, and 11) boosting the immune system (Song, Frazier, and Pettis 2018; Song and Pettis 2018).

Most existing empirical studies measure absolute accessed status through the position or name generator and demonstrate its positive role for health across societies: mental health and health information search in the United States; general health and healthy body weight in Montreal, Canada; general health, mental health, and health literacy in Taiwan; and general health in Belgium (e.g., Lee et al. 2017; Moore et al. 2011; Moore, Daniel, Paquet, Dubé and Gauvin 2009; Song 2011; Song and Chang 2012; Song and Lin 2009; Verhaeghe et al. 2012; Yang et al. 2013). Three community studies in the United Kingdom, Japan, and rural China measure accessed social capital through the resource generator and report its positive association respectively with mental health, general health and health-related quality of life (Kobayashi et al. 2013; Sun, Liu, and Webber 2017; Webber and Huxley 2007). A two-wave longitudinal clinical study in the UK shows no evidence for the role of accessed resources in the course of depression (Webber, Huxley and Harris 2011).

Some studies investigate the indirect, mediating, and interaction effects of accessed status. A couple of U.S. studies report that absolute accessed status is indirectly associated with mental health and body weight through subjective status and health lifestyle (Song 2011; Song, Pettis, and Piya 2017). A few studies in the United States and Montreal, Canada find that absolute accessed status mediates the associations between more upstream factors (age, gender, race/ethnicity, SES, neighborhood advantage, social integration, social cohesion, psychological resources) and health outcomes (Moore, Stewart, and Teixeira 2014; Haines, Beggs, and Hurlbert 2011; Song 2011; Song et al. 2017).

The analysis of the interaction effect of accessed status requires the combination of Lin's theory with other theories or perspectives. Song and Lin (2009) propose a pair of competing explanations on the interaction between personal and social capital. The compensation effect proposition expects people with lower status to need, mobilize, and benefit more from alters' resources, while the cumulative advantage proposition anticipates those with higher status to invest, mobilize, and benefit from alters' resources more successfully. Supporting the former proposition, the positive association between accessed occupations and mental health is stronger for those with lower education in Taiwan (Song and Lin 2009). Also, accessed status interacts with gender. Accessed education is associated with body weight ratings negatively for women but positively for men in the United States (Song et al. 2017). Arguably alters' resources help produce and reproduce the gendered body weight norm at the network level. Accessed resources is positively associated with health (health-related quality of life in rural China and general health in urban Japan) more strongly for women (Kobayashi et al. 2013; Sun et al. 2017). Arguably women seek and mobilize resources from social contacts more actively than men. A community study in Canada documents

accessed status as a stress buffer (Mandelbaum et al. 2018). The diversity of accessed occupations negatively moderates the positive association between maternal stress and children's emotional overeating.

Social cost theory recently emerges in competition with Lin's social capital theory (Song forthcoming; Song and Pettis 2018; Song et al. 2018). Lin's theory emphasizes the bright side of accessed status as a resource source and builds on the social resources assumption that alters' resources are valuable and protective. Social cost theory highlights the dark side of accessed status as a source of detrimental social expenses and rests on the social expenses assumption. Three mechanisms are possible for the harmful role of absolute accessed status and relative higher accessed status and the protective role of relative lower accessed status: upward or negative social comparison, receipt of harmful resources, and burdensome networking investment and expenses. Song argues that the social resources assumption applies more to instrumental and objective outcomes but the social expenses assumption to expressive, subjective, and evaluative outcomes. Three single-society studies examine the double-edged role of accessed status. Findings on mental health in urban China and South Korea support social cost theory (Lee and Kawachi 2017; Song 2015b). Findings from South Korea and Montreal show that the double-edged role varies by gender and education in the prediction of mental health and psychological resources (Lee and Kawachi 2017; Moore, Daniel, Gauvin, and Dubé 2009).

Song further proposes three institutional explanations to predict the varying explanatory power of the two competing theories: collectivistic advantage, collectivistic disadvantage, and inequality structure (Song 2014a, 2015a, forthcoming; Song and Pettis 2018; Song et al. 2018). The collectivistic advantage explanation anticipates that social capital theory applies more to collectivistic societies but social cost theory individualistic societies, while the collectivistic disadvantage explanation predicts the opposite. The inequality structure explanation expects that social capital theory applies to more egalitarian societies and social cost theory more unequal societies. Song and colleagues use data simultaneously collected from three societies (the United States, urban China, and Taiwan) and examine the associations of accessed status with depression, life satisfaction, and self-reported health limitation (Song 2014a, 2015a, forthcoming; Song and Pettis 2018). The collectivistic disadvantage explanation and the inequality structure explanation receives tentatively more evidence respectively in the analysis of mental and physical health. Methodologically, some indicators of accessed status (average and lower reachability) fit more to social capital theory but some (higher reachability and relative higher accessed status) to social cost theory.

In addition, social capital exists in electronic networks. Social capital in online mothers' networks influence mothers' and their children's health through the provision of social support (Drentea and Moren-Cross 2005). Social capital among vaccine-refusing mothers provides social support and validation during online discussion (Reich 2018).

Coleman: Neighborhood, family, and workplace

Many scholars fail to recognize that Putnam's work draws upon Coleman's. They cite only Putnam's work when analyzing his three forms of social capital that overlap with the six forms Coleman distinguishes. We

review studies here that cite and extend Coleman's idea to health in three life domains: neighborhood, family, and workplace.

Sampson and colleagues develop a neighborhood-level collective efficacy theory (Sampson, Morenoff, and Earls 1999; Sampson et al. 1997). It redefines social capital as shared expectations for action among neighbors. Collective efficacy has three elements: informal social control (neighbors are counted on to intervene), social cohesion (neighborhood is close-knit; neighbors help each other, get along, and share values), and trust (neighbors can be trusted). It is measured as the aggregation of individual responses. It is spatially dynamic in that it spills over between surrounding neighborhoods.

Collective efficacy is expected to protect health by depressing health risks in neighborhoods, creating stress buffers such as social support and safety nets, and maintaining and achieving health-relevant resources (Drukker et al. 2005). Results are mixed. Drukker and colleagues (2003) analyze mental and general health of one grade of primary school students in Maastricht, the Netherlands, and find a positive association only between informal social control and mental health. Drukker and colleagues (2005) further compare these students with children aged 12 in Chicago. The three elements of collective efficacy are positively associated with perceived health for the Dutch sample but only for the Hispanic subsample in Chicago. Another study from Chicago measures the combination of reciprocal exchange and local voluntary participation at the neighborhood level (Morenoff 2003). Neighborhood internal social capital protects birth weight and mediates the effect of neighborhood poverty and residential mobility. Also, social capital from surrounding neighborhoods predicts birth weight more strongly for focal neighborhoods with more internal social capital. A U.S. study reports the positive association between a latent collective efficacy factor and children's general health with family functioning as a mediator (Fan and Chen 2012). A longitudinal study in Los Angeles documents the negative effect of a collective efficacy scale on body weight increase only among women (Ullmann, Goldman, and Pebley 2013). A study in Pennsylvania finds the positive association between collective efficacy (neighbors' collective neighborhood improvement efforts) and African-American women's use of mammography (Dean et al. 2014). A Dutch study documents the positive association between neighborhood social cohesion and health with physical activity as a mediator (Mohnen et al. 2012).

Some scholars investigate both family and community social capital. A longitudinal study of young people in England finds that mental health is positively associated with family social capital (parental relationships, evening meal with family, and parental surveillance) but not with community social capital (parental involvement at school, sociability, and involvement in activities outside home) (Rothon, Goodwin and Stansfeld 2012). A community study in China reports that family (parent-child interaction and parental monitoring) and community (social cohesion, trust, sense of belonging, neighbors' care about and attention to children) social capital negatively mediate the positive association between parental migration and depression (Wu, Lu, and Kang 2015).

Some scholars examine workplace social capital (Suzuki et al. 2010). Using data of workers in Okayama, Japan, they measure trust and reciprocity at the individual and company levels. With the

exception of company reciprocity, all the other three indicators are positively associated with workers' health.

Putnam: Expansive applications and mixed evidence

Kawachi and colleagues first applied Putnam's idea of social capital and reported its mediating effect on the income inequality-mortality relationship in 1997. A huge body of empirical applications have emerged since then. Results are mixed, varying with forms, indicators and levels of social capital, outcomes, units of analysis, data sources, populations, and societies. There is stronger evidence for the salubrious effects of trust and individual social capital.

Putnam's three forms of social capital are divided into the structural (social connections) and cognitive (trust and norms of reciprocity) dimensions (Bain and Hicks 1998). His bonding and bridging social capital is grouped into horizontal (between people of equals) and vertical or linking dimensions (between people interacting across institutionalized power gradients) (Islam et al. 2006; Szreter and Woolcock 2004). Going beyond his focus on the state level, scholars measure both individual social capital, which exerts a compositional effect and ecological social capital (usually as the aggregation of individual responses at the community, state, and country level), which has a contextual impact (Poortinga 2006).

Different possible mechanisms link different levels of social capital to health (Kawachi 1999; Kawachi, Kennedy, and Glass 1999; Kawachi, Kennedy, and Wilkinson 1999). Pathways for individual and neighborhood social capital overlap, including social support, healthy norms and behaviors, social engagement, psychological resources, and physiological and biological mechanisms. Pathways for neighborhood social capital further include informal social control, local services and facilities, and collective socialization. State social capital operates through egalitarianism-oriented political participation and policymaking.

At the individual level, a U.S. longitudinal study reports that only one out of five social capital indicators, neighbor trust, decreases major depression (Fujiwara and Kawachi 2008a). In a U.S. adult twins study, only one out of four social capital indicators, neighbor trust, is consistently positively related to one out of four health outcomes among both monozygotic and dizygotic twins (Fujiwara and Kawachi 2008b). In two British longitudinal studies, only one out of three social capital indicators, generalized trust, is positively associated with psychological and general health (Giordano, Björk, and Lindström 2012; Giordano and Lindström 2011). A longitudinal study in rural Malawi measures four indicators of social participation (Myroniuk and Anglewicz 2015). Varying by gender, age, health outcome, and indicator of social participation, its results show that social participation predicts better physical health but worse mental health. A study of 78 countries measures three forms of social capital: particularized and generalized trust, and social participation (Glanville and Story 2018). All three forms are positively associated with general health. One specific indicator of each trust factor also positively interacts with social participation.

At the neighborhood level, the association between death rates and social capital varies by cause of death, race/ethnicity, gender, and social capital indicator in Chicago (Lochner et al. 2003). At the U.S. state level, all three social capital indicators—civic engagement, generalized trust, and reciprocity—are positively associated with general health, and the first two indicators are negatively related to total mortality rates (Kawachi et al. 1997; Kawachi et al. 1999). One U.S. study measures two county social capital scales using five indicators and two state social capital scales using ten indicators (Kim et al. 2006). State social capital predicts negatively obesity and physical inactivity, while county social capital physical inactivity. American Indians/Alaska Natives (versus whites) benefit less from both levels of social capital in the prediction of obesity. Another U.S. study captures county social capital using three indices and six indicators and state social capital using five indices and twenty-seven indicators (Lee and Kim 2013). It demonstrates the acceptable validity of most indices but reports their varying associations with population health outcomes.

Many studies analyze multilevel social capital. In a U.S. study, three out of six individual social capital indicators and community bonding (instead of bridging) social capital are positively associated with general health (Kim, Subramanian, and Kawachi 2006). In a community study in Japan, elderly people's dental status is positively associated with individual and community horizontal (instead of vertical) social capital (Aida et al. 2009). In a study of China, individual bonding trust is positively associated with general health in both rural and urban China, individual and county bridging trust do so only in urban China, but social participation has no effect (Meng and Chen 2014). In a study of 45 countries, individual and national voluntary participation and individual trust are positively associated with general health (Mansyur et al. 2008). In a study of 22 European countries, individual (instead of national) civic participation and generalized trust predict general health (Poortinga 2006). In a study of 35 European countries, individual (instead of national) trust is positively associated with general health (Campos-Matos, Subramanian, and Kawachi 2016). In a study of 69 countries, individual and national trust positively predict general health and interact with each other (Jen et al. 2010).

In addition, social capital can be detrimental directly or indirectly through across-level interaction (for a review see Villalonga-Olives and Kawachi 2017). In a community study on individual social capital in Sweden, high social participation combined with low trust is positively associated high alcohol consumption among men (Lindström 2005). In a study of 40 U.S. communities, community trust protects health for high-trust individuals but damage health for low-trust individuals (Subramanian, Kim, and Kawachi 2002). In a study of India, community intragroup bonding (instead of intergroup binding) ties are negatively associated with women's antenatal care use and children's complete immunization, and they benefit individuals with lower intragroup bonding ties but hurt those with higher such ties (Story 2014). In two studies of respectively 22 and 35 European countries, higher national social capital protects health for individuals with high social capital but hurt those with lower social capital (Campos-Matos et al. 2016; Poortinga 2006). In a study of 45 countries, the protective effects of individual and national voluntary

participation decrease respectively with the increase of national and individual voluntary participation (Mansyur et al. 2008). Such interaction effects also vary by country subgroup.

Simultaneous applications of diverse approaches

Some scholars, explicitly or implicitly, apply diverse approaches to social capital simultaneously to health. In a U.S. study, social participation is associated with mental health only indirectly through average reachability of accessed status (Song 2011). In a British study, all three forms of social capital (trust, social activities with friends and relatives, and absolute accessed classes) are positively associated with general health and mediate the effect of neighborhood deprivation (Verhaeghe and Tampubolon 2012). A Canadian study compares two trust factors with five forms of social capital (diversity of accessed status, group membership, geographic-based close family and friend ties, and neighborhood social capital) (Carpiano and Fitterer 2014). Only the two trust factors are consistently positively associated with general and mental health. They are also positively associated with all forms of social capital with the exception of geographic-based close family ties. In a study in Belgium, regular smoking is negatively associated with structural (instead of cognitive) family social capital and cognitive school (instead of community) social capital (De Clercq et al. 2014). A study from India analyzes six forms of social capital at both the individual and community levels: intergroup bridging ties, intragroup bonding ties, political participation, accessed status, neighborhood cohesion, and collective efficacy (Story 2014). Only individual accessed status and community intergroup bridging ties are consistently positively associated with all three types of health care utilization. A study of 17 European countries measures four forms of social capital: frequency and size of informal social connections, participation in social groups, trust in institutions, and sense of belonging (Pinillos-Franco and Kawachi 2018). Varying by gender, results show that the last three forms (with the exception of religious participation) are positively associated with general health.

Three studies draw data from the same longitudinal three-wave community survey in Montreal but measure social capital differently. One study uses the first wave of data and captures six forms of social capital: core ties and core tie diversity (measured through the name generator), general and neighborhood network capital (measured through the position generator), generalized trust, neighbor trust, neighborhood cohesion, and neighborhood and general social participation (Bassett and Moore 2013). Four forms of social capital (core tie diversity, generalized trust, neighbor trust, and neighborhood cohesion) are negatively associated with depressive symptoms. The other two studies employ all the three waves of data. One of them measures four forms of social capital (accessed status, accessed kin ties, generalized trust, and social participation) and controls for social isolation (Wu, Moore, and Dube 2018). The risk of obesity is negatively associated with the diversity of accessed status and generalized trust but positively associated with accessed kin ties. The other study includes social isolation into the measurement of social capital (diversity of accessed status, generalized trust, neighbor trust, and social participation) (Moore and Carpiano 2019). Varying by form of social capital, gender, health outcome, results show stable relationships of the same social capital measures over time, weak relationships between different social

capital measures, lack of upstream social capital measures, and a more salient social capital-health relationship among women than among men.

Challenges and Future Directions

Social capital has opened up a burgeoning multidisciplinary health research literature during the last three decades. Four scholars – Bourdieu, Lin, Coleman, and Putnam – have contributed to the theoretical construction of social capital from different perspectives. Among them, Putnam's notion has captured more attention. Sociological theories are relatively understudied but have increasingly enjoyed fruitful applications and extension. Despite its enormous progress, this literature now faces challenges in its future theoretical and methodological growth.

Four theoretical challenges require future efforts: the relationship with other network-based concepts, rival theories competing with social capital theories, theories on the non-direct roles of social capital, and the convergence of different social capital theories. First, social capital is a relatively new network-based concept and its relationship with longer-established network-based concepts (e.g., social networks, social cohesion, social integration, and social support) remains a challenge (Berkman et al. 2000; Pescosolido 2007). Lin's stricter conceptualization allows us to distinguish his idea of social capital from these longer-established concepts and theorize their causal relationships with each other (Song 2013a, 2019; Song and Lin 2009; Song, Son, and Lin 2011). The normative functionalist perspective as well as some scholars' extension of Bourdieu's approach, however, subsume these longer-established concepts under the umbrella of social capital, which spotlights these concepts but blurs their distinction from and relationships with social capital. Such equalization pours old wine into new bottles, endangers the added theoretical value of social capital, and mixes social capital with its sources and outcomes (Kawachi et al. 2004; Lin 2001; Portes 1998). Since each of these longer-established concepts already has a complex relationship with health (Moen, Dempster-McClain, and Williams 1989; Song 2013b, 2014b; Song and Chen 2014), results on the social capital-heath relationship are unsurprisingly very complicated, which hinders theoretical synthesis and development. Scholars should draw upon the research traditions on these longer-established concepts. Theories and evidence in these traditions can inform and facilitate social capital research. For example, the three perspectives respectively on the positive, negative, and varying health effect of social integration (role enhancement, role strain, and role context) can help explain some mixed results on social capital conceived as social participation (Moen et al. 1989).

Second, facing the growing evidence on the detrimental effects of empirical indicators of social capital, we demand rival theories that compete with social capital theories. The social capital theories are based on the assumption that empirical indicators of social capital should be beneficial and protective. They are inadequate to explain the unexpected detrimental effects. Social capital is a concept at the theoretical level. It is not social capital but its empirical indicators that play puzzling double-edged roles for health. Competing theories in combination with social capital theories will help address such double-edged roles. Song recently attempts to propose social cost theory in contrast with Lin's social capital theory to theorize

the harmful impact of accessed status (Song forthcoming; Song and Pettis 2018), which needs further empirical test. Scholars applying the normative functionalist perspective speculate arguments for the adverse findings but have not formulated a systematic competing theory (Villalonga-Olives and Kawachi 2017). This perspective's broad definitions add difficulties for the formulation of competing theories.

Third, we require more theories on the non-direct effects of social capital: interacting, mediating, and indirect effects. We need to build institutional theories to explain the varying results between societies. Song develops three institutional explanations for the varying explanatory power of social capital and social cost theories across society (Song forthcoming; Song and Pettis 2018). Her efforts, however, are limited to only two institutional factors (relational culture and inequality structure) and her secondary data only three societies. Scholars extending Putnam's approach to the country level employ data from a large size of societies, ranging from 22 to 78. Some of them mention possible institutional moderators (e.g., culture, democracy, welfare policies, and economic development) (Jen et al. 2010; Mansyur et al. 2008). But they neither provide theoretical elaboration nor conduct any direct examination. The above review suggests other moderators. Scholars taking the network-based conflict perspective theorize the interaction of social capital with personal capital and gender (Song and Lin 2009; Song et al. 2017; Veenstra and Abel 2015). Naturally flowing from this perspective, future research should explore how other network-based factors and other stratifiers interplay with social capital. Scholars applying the normative functionalist perspective find rich results on diverse sociodemographic moderators (e.g., age, gender, and race/ethnicity) but explanations are not clear enough. Relevant sociological theories can help organize such results into a theoretical guiding framework (Song 2013; Song et al. 2010). The extension of Putnam's approach to cross-level social capital interaction also generates mixed results, which need more theoretical elaboration. In addition, to fully understand disease-specific results and embed social capital into the health production process, more theoretical efforts are desired to jointly map the mediating and indirect effects of social capital on various health outcomes (Moore et al. 2014; Moore and Carpiano 2019; Song 2011; Song et al. 2017). The normative functionalist perspective's broad definitions create more challenges in the theorization of these non-direct effects.

Furthermore, leaving behind all the debates on the nature and definitions of social capital, some scholars have put different approaches to social capital into simultaneous examination (Carpiano and Fitterer 2014; Verhaeghe and Tampubolon 2012; Moore and Carpiano 2019). Their attempts reconcile diverse approaches into an inclusive investigation and create social integration and social cohesion to some degree between previously exclusive social capital research communities. Their findings clarify that social capital constructs conceived by different perspectives are conceptually distinct. The publication of their work seems to signal that we are now gradually leaving the age of social capital opposition and entering the harmonious age of social capital pluralism. Their integration efforts, however, also illustrate the obstacles on the way to social capital pluralism. It is arduous to combine different approaches. Each approach, in particular the normative functionalist approaches that offer broad definitions, is already complicated enough in terms of measures and mechanisms. The social capital research paradigm may become ever

expanding and then too gigantic to be clearly comprehended and productively moved forward. An appropriate combination of different approaches also requires measures consistent with these approaches. Due to data limitations, however, scholars use some proxy indicators of network-based social capital (e.g., tie strength and social isolation) or only a limited number of measures (Wu, Moore, and Dube 2018; Moore and Carpiano 2019). Ideally, future theory-driven first-hand data collection will facilitate the simultaneous investigation of diverse approaches.

Finally, apart from theoretical challenges, we also face methodological ones. Bourdieu's theory lacks explicit operationalization and measurement of social capital, which restricts its extension to health and produces controversial theoretical and empirical applications. Instead of measuring social capital as in the normative functionalist approaches or other established network-based factors (Carpiano 2006; Pinxten and Lievens 2014; Veenstra 2007; Ziersch 2005), Bourdieu's two elements of social capital (network size and alters' capital) are more consistent with Lin's notion and measurement. Bourdieu's and Lin's approaches have converged in recent work on the interplay between social and personal capital (Song 2011; Song and Lin 2009; Song et al. 2017; Veenstra and Abel 2015). In the examination of Lin's theory (as well as social cost theory), for the purpose of generalizability and stronger causal inferences, we need longitudinal research designs that contain diverse network instruments, multiple indicators of absolute and relative accessed status, dynamics of disease and illness, and potential antecedents and mechanisms (Song et al. 2010; Webber et al. 2011). We also need to go beyond the qualitative applications of Lin's theory in the cyberspace and quantitatively capture online social capital (Drentea and Moren-Cross 2005; Reich 2018). In addition, we need to analyze Lin's idea of mobilized and macro-level social capital. The normative functionalist perspective receives much more attention but also generates much more mixed results partly due to the use of diverse measures of social capital at multiple levels, some of which go beyond Coleman's or Putnam's original interests. Future research needs to conduct theory-driven longitudinal data collection, derive consistent theory-driven measures from secondary data, and make more efforts to validate these various measures (Lee and Kim 2013).

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Figure 7.1 Articles with "social capital" and "health" in their topics: Web of Science (1979-2019)