

## Chapter 2

# Workplace Social Capital and Health

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Social capital involves social relations and networks, norms of reciprocity, and trust, which facilitate coordination and cooperation for mutual benefit (Coleman, 1990; Putnam, 1993). Traditionally, social capital has been studied in neighborhoods, communities, societies, and even nations. More recently, however, researchers have also examined social capital at workplaces. This is justifiable because, by definition, social capital is not restricted to any particular social entity or social networks of any specific size (Stone & Hughes, 2002). Furthermore, at work, people are typically exposed to a reasonable amount of social relations and day-to-day interactions. Thus, the workplace may constitute an important social context for social capital (Lindström, 2008).

Original studies on social capital have focused on schools, and a large body of research exists on residential areas. So why have workplaces suddenly become such a popular target for researchers in this field? The intensification of working life is probably one reason as it has made it harder for people to maintain contact with friends and neighbors. Long working hours have become the culture in many

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workplaces, and more time is used commuting due to suburban sprawl. This development appears to have displaced time otherwise spent in community and social involvement (Halpern, 2005). Putnam (2000) suggests that there has been a transfer from residence-based to work-based communities in terms of time spent and social relations experienced. Accordingly, a potential decline in volunteer-based social participation and social capital in communities might be counterbalanced with the emergence of employment-based social cohesion and social capital at the workplaces.

This chapter introduces the recent extension of social capital research into workplaces. We first discuss the conceptual and empirical backgrounds of workplace social capital research, highlighting the relations with this research in community settings. Then we review the ways in which social capital has been assessed at workplaces and look at the research on social capital at the workplace as a determinant of employee health. In addition, we provide results from a comparative study between Finland and Japan, to highlight the extent to which this association may be dependent on cultural context. We close this chapter by suggesting directions for further social capital research in workplaces.

## 2.1 Social Capital and Other Psychosocial Factors Related to Employee Health

The psychosocial environment of the workplace has received much attention over the last few decades. The job strain concept, a seminal theoretical model introduced by Karasek in the late 1970s (Karasek, 1979), proposes that high demands and low control, in conjunction with low coworker support, are conducive to work stress. Subsequently, Siegrist (1996) described the psychosocial features of work from the perspective of gaining rewards from one's efforts. Here, the theoretical focus is on the norm of social reciprocity. The model posits that efforts at work should be balanced by rewards such as adequate salary, respect and esteem, job security, and status consistency; otherwise, stress is likely to emerge. While the effort–reward imbalance concerns distributive injustice, the view was later broadened to organizational injustice in the procedural and relational procedures of management (Elovainio, Kivimäki, & Vahtera, 2002; Kivimäki et al., 2005). Justice in an organization is manifested as the quality of interpersonal treatment and accurate, correctable, ethical decision-making procedures (Moorman, 1991).

More recent evidence suggests that trust, social networks, and social cohesion at the workplace, that is factors related to social capital, might also be relevant in research on employee health (Kawachi, 1999). This evidence indicated that focus should also be placed on specific aspects of the trusting climate, participative approach, and interactional relationships at the workplace, and that group-level social cohesion should be taken into account.

The “old” and “new” concepts describing the psychosocial environment are likely to be interrelated. Indeed, evidence suggests that workplace social capital

may buffer the effect of job stress (Sapp, Kawachi, Sorensen, LaMontagne, & Subramanian, 2010). Conversely, a low level of integration within a social network and low social capital may increase vulnerability to adverse health effects of job stress. Supportive relationships may also encourage healthier behavior patterns in terms of coping with stress (Wilkinson & Marmot, 2003). It is also possible that job stress mediates the effects of low social capital on health through biological mechanisms such as an activation of the hypothalamus–pituitary–adrenal (HPA) axis (Oksanen et al., 2012). Furthermore, improved work organization may help to decrease less desirable consequences of social capital at the workplace, such as bullying. A Swedish study reported that procedural justice concerning decision making within the organization is important in encountering the emergence of workplace bullying (Oxenstierna, Elofsson, Gjerde, Hanson, & Theorell, 2012).

Work life has changed dramatically since the first models of psychosocial work environment were launched. Current workplaces are characterized by organizational restructuring, mergers, and the outsourcing of many functions. This requires flexibility and the ability to adapt to continual change. Another driver for change is the proliferation of temporary employment (Gospel, 2003). It is estimated that sooner or later most organizations will have only a small core of full-time, permanent employees. Short-term contracts have now replaced jobs for life, and consequently, mobility between employers has become inevitable. In these circumstances, individual networks are valuable, because careers are increasingly in own hands (Cooper, 2002). At the same time, increasing emphasis is placed on cooperation and collaboration both inside and outside the workplace. According to the proverb “No man is an island,” employees and companies do not thrive when isolated: networking is important. These changes have called for a new understanding of the psychosocial work environment from the perspective of the whole work community; here the concept of workplace social capital is highly relevant. Workplace social capital provides a way of talking and identifying the nature and impact of relationships between people from diverse backgrounds who need to cooperate and exchange information in today’s complex working life (Hofmeyer & Marck, 2008).

## **2.2 Why Is the Workplace an Important Context for Social Capital and Health Research?**

As noted at the outset of this chapter, the vast majority of previous studies have focused on social capital in residential/geographical neighborhood (Kawachi, 1999; Lindström, 2008). However, compared to large geographic units (countries, cities, or even neighborhoods), workplace may capture important social interactions and networks appropriately (Sundquist & Yang, 2007) within a clearly defined proximal setting, such as the work unit. In the first chapter of *Social Capital and Health*, Kawachi, Subramanian, and Kim (2008) raised three charges against social capital research: (a) mapping the presence of social capital across communities raises the risk of “blaming the community” for its problem, (b) the concept of social capital could be utilized as a “cheap” alternative to Third Way politicians solving the

problems of poverty and health inequalities, and (c) no clear policies and interventions have been needed to build up social capital. We argue that studies on workplace setting could potentially provide a way with which to tackle these charges.

With regard to point (a), mapping of the level of social capital across groups may highlight constructive messages for the settings. For a work unit with lower social capital within a company, the criticism may initially be upsetting, but comparisons at the company rather than work unit level may be better tolerated. From the employees' viewpoint, it is important to know whether social capital in the organization is likely to promote or damage well-being, since unfavorable results may motivate corrective actions at the workplace, or the employee may find another company in which to pursue a better work–life balance. During a severely stagnated economic situation, companies may benefit from high workplace social capital as a coping strategy because ideally social capital may facilitate cooperation and coordination without increasing costs. This also relates to point (b).

Regarding point (c), there are several forms of “capitals”: financial, material, natural, human, and social. They may, in fact, be more familiar at workplaces than in the community. Corporate executives have already recognized that capitals are the targets of investment. At workplaces, human capital has been continuously invested in through on-the-job training that is planned, organized, and conducted at the employees' worksite. Such investments in social capital are currently rarer. Interestingly, financial and material capitals decrease as we use them. In contrast, social capital, as well as human capital, increases the more we use them.

In addition to the three points above, several other problems have been acknowledged in social capital research: (d) the modifiable areal unit problem (MAUP), (e) the “dark side” social capital, and (f) the need to find determinants (source) of social capital. There might be several advantages to resolving these problems in workplace settings as well as in community settings.

In relation to point (d), in community studies, researchers need to define “reference area” in order to aggregate individual responses when creating group-level social capital indicators. The reference area can vary from large state to small neighborhood depending on the study hypothesis and availability of the data, but there is relatively little systematic research to identify the most adequate spatial unit. The definition of nonspatial groups, such as workplaces or schools, may pose fewer problems in this regard because questions can be raised about the definite boundary (Harpham, 2008).

As noted in point (e), strong bonding social capital can sometimes be seen as a detrimental factor to health (Portes, 1998). In the Hippocratic Oath, the well-known phrase “First, do not harm” is one of the principle precepts of medical ethics. We need to pay a great deal of attention to this principle when we apply the concept of social capital to the context of community. At the workplace, employees' health is legally protected (e.g., by the Occupational Safety and Health Law) and employers are responsible for promoting (or, at least, not damaging) their employees' health. Within this framework, trials of social capital at the workplace may be more straightforward than in a community, because in the case of any adverse event, a specific person is responsible for taking corrective actions.

At the workplace, as well as in communities, the “dark side” social capital may exist. In other words, social capital may be used to exclude outsiders, place excess

claims on group members, restrict individual freedom, or reinforce adverse health behaviors when they are defining characteristics of group (Portes, 1998). It is noteworthy, however, that in previous community studies, the “dark side” of social capital has been observed in deprived settings (Mitchell & LaGory, 2002) rather than in more privileged settings (Iwase et al., 2012). In terms of social hierarchy, employed people do not generally belong to the lowest category in respect to their income, education, and occupation. From this point of view, a negative effect is less likely at the workplace than in a community. However, there are other types of social interaction at work, such as workplace bullying, which can damage workers’ health. Therefore, it is important to try to disentangle the link between social capital and other related concepts in the workplace setting.

The last point, related to the determinants of social capital, is closely associated with the abovementioned intervention issue. At the time when companies are established, there is little built social capital: only the determinants of social capital may be available to foster future social capital. For research, this means that, in principle, it is possible to observe the whole natural history of social capital at workplaces, from its birth to possible erosion; this opportunity is rarely available in studies of communities. In a community, health determinants often exist outside the control of the health domain, as suggested by the Commission on Social Determinants of Health (WHO) in their final report (2008). Compared to community settings, at workplaces, at least at the corporate executive level, there is authority to intervene in some of these non-health-domain determinants of health, through income policies and the development of work conditions.

## 2.3 How to Measure Social Capital at Work

The operationalization of workplace social capital has varied between studies. Some researchers have emphasized trust as a key element, as it facilitates cooperation and contributes to social cohesion (Coleman, 1990; Putnam, 1993). They suggest that trust provides an appropriate proxy of social capital, although the opponents counteract this by stating that trust is a source or a consequence of social capital (Ziersch, 2005).

### 2.3.1 *Measuring Trust*

The measures of trust at the workplace have included items such as “Generally speaking, would you say that most people in your company can be trusted, or do you think that you cannot be too careful when dealing with people?” (Suzuki, Fujiwara, et al., 2010; Suzuki, Takao, et al., 2010); “I trust the people I work with” (Sapp et al., 2010); “How would you rate the level of workers’ trust in management at your workplace?”; “How much do you trust the people you work with?” (Helliwell & Huang, 2010, 2011); and “In our organization we trust each other” (Ernstmann et al., 2009; Jung et al., 2011; Kowalski, Driller, et al., 2010; Kowalski, Ommen, et al., 2010).

A problem arises when we do not know the precise attitude that trust actually refers to. For example, does the question “How much do you trust people you work with?” refer to a specific audience? In the school context, for instance, teachers may include school children’s parents as people that they work with. Or in the context of social welfare services, clients are sometimes included in the ratings of people one works with. Especially when comparing results across studies, ambiguity can be problematic.

Contextual and cultural differences may also play a role, as suggested by Baron-Epel, Weinstein, Haviv-Mesika, Garty-Sandalon, and Green (2008). They interviewed Arabs and Jews in Israel about social capital including social trust. The two ethnic groups did not generally live in mixed communities, and the Arab community was characterized as being more collective. Surprisingly, their perceptions of whether most people can be trusted were significantly lower than those in the Jewish community (38 % vs. 63 % reported high trust). The authors concluded that Arabs may have perceived the question of trust as designed to probe their suspicion and distrust of people who are not part of their collective entity but, instead, part of the community outside the extended family. In the culturally diverse workplace, cross-cultural measurement equivalence may therefore be important.

Using trust as a single item to measure social capital may be theoretically problematic given that social capital is a multi- rather than unidimensional concept. Szreter and Woolcock (2004), for example, suggested that social capital entails a bonding, bridging, and linking dimension. In daily connections at the workplace, the bonding and bridging dimensions of social capital include relationships with coworkers and networking with collaborators and business partners, whereas the linking dimension refers to the relations across power gradients including the relations between employees and their managers or representatives of the governance. Alternatively, at the workplace, the horizontal component of social capital at the workplace includes relationships between employees at the same level of hierarchy (Szreter & Woolcock, 2004), and the vertical component refers to connections that span the different levels of power at the workplace. If all these components of social capital are always at play at workplaces, this should be reflected in the measurements of workplace social capital.

### ***2.3.2 Multicomponent Measures of Social Capital***

A composite index can comprise several core aspects of social capital at the workplace. In the German context, Jung et al. (2012, 2011) used the Social Capital in Organizations Scale (six items) to assess individual-level horizontal social capital as perceived common values, support, cohesion, and trust in the organization. Ernstmann et al. (2009) compiled six items to assess two key features of workplace social capital, namely, common values and perceived trust in the organization (hospitals). This follows that although researchers in the field now face a bewildering choice of measures of workplace social capital, few have been specifically validated to measure social capital at the workplace.

**Box 2.1. A Short Measure of Social Capital at Workplace**

1. People keep each other informed about work-related issues in the work unit
2. We have a ‘we are together’ attitude
3. People feel understood and accepted by each other
4. People in the work unit cooperate in order to help develop and apply new ideas
5. Do members of the work unit build on each other’s ideas in order to achieve the best possible outcome?
6. Our supervisor treats us with kindness and consideration
7. Our supervisor shows concern for our rights as an employee
8. We can trust our supervisor

The Finnish Public Sector Study (FPSS) developed and psychometrically tested a short multi-item instrument to specifically assess social capital at the workplace (Kouvonen et al., 2006). As shown in Box 2.1, the short measure of workplace social capital comprises eight items that indicate whether people feel that they are respected, valued, analyzed, and treated as equals at work rather than feeling that it is all a matter of seniority in their hierarchy. Furthermore, the definition of workplace social capital is in agreement with the current notions of the concept, such as the widely used definition offered by Kawachi, Kennedy, Lochner, and Prothrow-Stith (1997): “Those features of social structures, such as levels of interpersonal trust and norms of reciprocity and mutual aid, which act as resources for individuals and facilitate collective action.”

This measure of workplace social capital appreciates its multidimensional nature. It covers some aspects of bonding social capital with issues of horizontal tight-knit ties and relationships with coworkers who are trusted and share similar values of reciprocity and mutual aid in daily interactions needed to “get by” at work (items #1–3), bridging social capital with issues involving cooperative relationships with coworkers in all occupations that needed to “get ahead” (items #4–5), and linking social capital with issues about relationships between people who interact across authority gradients at work (items #6–8).

## 2.4 Workplace Social Capital and Health

In this section, we summarize the methods and findings of previous studies on workplace social capital and health. First, we will summarize the findings of studies in nonmedical settings (either in the public or private sector). Although some Finnish studies include public sector employees working at hospitals, the findings of these studies are more applicable to general workers. After this, we will summarize previous findings in medical settings.

### ***2.4.1 Findings Regarding Workplace Social Capital and Health in Nonmedical Settings***

Table 2.1 provides details of 17 studies of workplace social capital and health in nonmedical settings. The studies used various indicators of social capital—ranging from proxy measures of social capital, such as employment security and social support (Liukkonen, Virtanen, Kivimäki, Pentti, & Vahtera, 2004) and social network (Suzuki, Takao, Subramanian, Doi, & Kawachi, 2009), to psychometrically validated multi-item instruments that captured both the cognitive and structural dimensions of social capital at the workplace (Kouvonen et al., 2006; Kouvonen, Oksanen, Vahtera, Stafford, et al., 2008; Kouvonen, Oksanen, Vahtera, Väänänen, et al., 2008; Oksanen et al. 2008, 2012; Oksanen, Kawachi, et al., 2011; Oksanen, Kivimäki, et al., 2011; Oksanen, Kouvonen, Vahtera, Virtanen, & Kivimäki, 2010; Väänänen et al., 2009). The health outcomes examined in these studies include self-rated health (Kouvonen et al., 2006; Liukkonen et al., 2004; Oksanen et al., 2008; Suzuki et al., 2009; Suzuki, Takao, et al., 2010), onset of depression (Kouvonen, Oksanen, Vahtera, Stafford, et al., 2008; Oksanen et al., 2010), smoking cessation (Kouvonen, Oksanen, Vahtera, Väänänen, et al., 2008), adverse lifestyle factors (including smoking status) (Sapp et al., 2010; Suzuki, Fujiwara, et al., 2010; Väänänen et al., 2009), all-cause mortality (Oksanen, Kivimäki, et al., 2011), incidence of hypertension (Oksanen et al., 2012), non-adherence to antihypertensive medication (Oksanen, Kawachi, et al., 2011), depressive symptoms (Jung et al., 2012) or psychological distress (Liukkonen et al., 2004), and life satisfaction (Helliwell & Huang, 2010, 2011). These studies were mainly conducted in Finland (ten studies) and Japan (three studies) but also in the USA, Canada, and Germany.

As discussed in Chap. 4, when researchers examine the relations between individual perception of social capital and health, they are presumably interested in the question of whether being surrounded by, say, trusting neighbors or coworkers can facilitate their health. Thus, if researchers conceptualize social capital as a characteristic of the group, or the target of the inference is the group itself, they need to capture the trustworthiness of the social environment to model the group's stock of trust (or reciprocity, etc.) while controlling for individual-level trust (or reciprocity, etc.). As a useful statistical approach, multilevel analyses have been conducted to define and identify the social context level correctly and thus to simultaneously examine the effects of individual- and contextual-level social capital on health. Of the 17 studies, nine conducted multilevel analyses with individual workers at level 1 and work units or companies at level 2 (Kouvonen et al., 2006; Kouvonen, Oksanen, Vahtera, Stafford, et al., 2008; Kouvonen, Oksanen, Vahtera, Väänänen, et al., 2008; Oksanen et al. 2008, 2010; Sapp et al., 2010; Suzuki, Fujiwara, et al., 2010; Suzuki, Takao, et al., 2010; Väänänen et al., 2009), whereas the remaining studies were conducted at an individual level.

Some of the strongest evidence to date of workplace social capital comes from the FPSS cohort. This cohort consists of approximately 150,000 public sector employees who were working in 10 towns and 21 hospitals between 1991 and 2005

**Table 2.1** Summary of 17 studies of workplace social capital and health in non-medical settings

Author(s), (year), location of study site(s)	Study design	Population/setting	Mean age (SD)	Sex (M/W)	Social capital measure	Outcome	Covariates	Analyses	Individual-level effect estimates	Contextual-level effect estimates
Liukkonen et al. (2004) Finland	Cohort study	6,028 public sector employees, in eight towns (3,998 established permanent employees, 1,563 employees with initially a fixed-term contract, and 467 initially subsidized employees)	Men: 43 (9.3) Women: 42 (9.4)	1,228/4,800	1. Employment security (permanent, fix-term contract, and subsidized contract) 2. Social support (short version of the distress Social Support Questionnaire)	Poor self-rated health Psychological distress	Age, marital status, occupational status, income, baseline levels of the health outcome in questions	Logistic regression analysis	1. Employment security Men ORs for poor self-rated health Fixed-term vs. permanent: 0.74 (0.61–0.90) Subsidized vs. permanent: 0.82 (0.61–1.11) ORs for psychological distress Fixed-term vs. permanent: 0.78 (0.65–0.92) Subsidized vs. permanent: 0.78 (0.59–1.03)	Not applicable

(continued)

**Table 2.1** (continued)

Author(s), (year), location of study site(s)	Study design	Population/setting	Mean age (SD)	Sex (M/W)	Social capital measure	Outcome	Covariates	Analyses	Individual-level effect estimates	Contextual-level effect estimates
									Women	
									ORs for poor self-rated health	
									Fixed-term vs. permanent:0.69 (0.44–1.08)	
									Subsidized vs. permanent: 0.79 (0.43–1.46)	
									ORs for psychological distress	
									Fixed-term vs. permanent: 0.66 (0.43–1.02)	
									Subsidized vs. permanent: 1.26 (0.71–2.24)	
									Note: The results of social support are not shown due to space limitation	

Kouvonen et al. (2006) Finland	Cross-sectional study (2000–2002)	45,480 public sector employees in 10 towns and 21 hospitals	10 town sub sample: 44.9 (NA)	8,709/36,771	Finland eight items <i>Individual level</i> : Q1 (low), Q2, Q3, Q4 (high)	Poor self-rated health	Age	Multilevel logistic regression analysis	Men Q1 vs. Q4: OR: 2.99 Q2 vs. Q4: OR: 1.69 (1.45–1.98) Q3 vs. Q4: OR: 1.32 (1.12–1.54)	Men Q1 vs. Q4: OR: 1.79 (1.51–2.11) Q2 vs. Q4: OR: 1.09 (1.09–1.57) Q3 vs. Q4: OR: 1.22 (1.01–1.47)
			21 hospital sub sample: 43.1 (NA)		<i>Work-unit level</i> : the mean of individual level responses in the work unit Q1 (low), Q2, Q3, Q4 (high) [self-included measure]				Women Q1 vs. Q4: OR: 2.42 (2.24–2.61) Q2 vs. Q4: OR: 1.67 (1.55–1.79) Q3 vs. Q4: OR: 1.36 (1.27–1.47)	Women Q1 vs. Q4: OR: 1.19 (1.10–1.30) Q2 vs. Q4: OR: 1.25 (1.15–1.36) Q3 vs. Q4: OR: 1.13 (1.04–1.23)
Oksanen et al. (2008) Finland	Cohort study (2000–2004)	9,524 local government employees in 1,522 work units	44.2 (8.1)	2,036/7,488	Finland eight items Changes in repeated assessment of social capital <i>Individual level</i> : low–low, high–low, low–high, high–high	Poor self-rated health	<i>Covariates individual-level social capital</i> : age, sex, occupational status, marital status, smoking status, alcohol use, physical activity, body weight	Multilevel logistic regression analysis	Ref. High–high Low–low: OR: 1.14 (1.65–2.36) High–low: OR: 1.86 (1.49–2.23) Low–high: OR: 1.19 (0.92–1.54)	Ref. High–high Low–low: OR: 1.14 (0.99–1.32) High–low: OR: 0.99 (0.82–1.19) Low–high: OR: 1.08 (0.91–1.29)

(continued)

**Table 2.1** (continued)

Author(s), (year), location of study site(s)	Study design	Population/setting	Mean age (SD)	Sex (M/W)	Social capital measure	Outcome	Covariates	Analyses	Individual-level effect estimates	Contextual-level effect estimates
					<i>Work-unit level:</i> low–low, high– low, low–high, high–high [self-excluded measure]		<i>Covariates for social capital:</i> proportion of temporary workers, proportion of men, proportion of manual worker, mean age, work unit size			
Kouvonen, Oksanen, Vahtrera, Stafford, et al. (2008) Finland	Cohort study (2000– 2005)	33,577 workers in 3,236 work units of 10 towns and 21 hospitals	43.8 (9.5)	6,623/26,954	Finland eight items <i>Individual level:</i> Q1 (low), Q2, Q3, Q4 (high)	Self-reported, physician diagnosed depression	Sex, age, marital status, socioeco- nomic position, of employer, smoking, alcohol use, physical activity, BMI	Multilevel logistic regression analysis	Q1 vs. Q4: OR: 1.34 (1.16–1.55) Q2 vs. Q4: OR: 1.16 (1.00–1.35) Q3 vs. Q4: OR: 1.06 (0.92–1.23)	Q1 vs. Q4: OR: 1.00 (0.85–1.16) Q2 vs. Q4: OR: 0.98 (0.84–1.14) Q3 vs. Q4: OR: 0.93 (0.80–1.09)
					<i>Work-unit level:</i> Q1 (low), Q2, Q3, Q4 (high) [self-excluded measure]					
Kouvonen, Oksanen, Vahtrera, Väänänen, et al. (2008) Finland	Cohort study (2000– 2005)	4,853 smoking workers in 1,946 work units of 10 towns and 21 hospitals	43.6 (8.8)	1,147/3,706	Finland eight items <i>Individual level:</i> Q1 (low), Q2, Q3, Q4 (high)	Smoking cessation	Sex, age, marital status, socioeco- nomic position, type of employer, alcohol use, physical activity, BMI, depression	Multilevel logistic regression analysis	Q4 vs. Q1: OR: 1.26 (1.03–1.55) Q3 vs. Q1: OR: 1.13 (0.92–1.38) Q2 vs. Q1: OR: 1.03 (0.84–1.26)	Q4 vs. Q1: OR: 1.05 (0.86–1.29) Q3 vs. Q1: OR: 1.06 (0.87–1.30) Q2 vs. Q1: OR: 1.02 (0.84–1.25)

*Work-unit level:*  
Q1 (low), Q2, Q3,  
Q4 (high)  
[self-excluded  
measure]

Väänänen et al. (2009) Finland	Cohort study (2000– 2005)	31,373 workers in 2,967 work units of 10 towns and (9.2) 21 hospitals	45.0 (9.2)	5,476/25,897	Finland eight items <i>Individual level:</i> Q1 (low), Q2, Q3, Q4 (high)	Number of adverse lifestyle risk factors (smoking, heavy drinking, physical inactivity, and overweight)	Sex, age, marital status, type of employer, co-occurrence at baseline, socioeco- nomic position	Multilevel multino- mial logistic regression analysis	1–2 vs. 0 risk factors: Q1 vs. Q4: OR: 1.02 (0.94–1.11) Q2 vs. Q4: OR: 0.99 (0.94–1.11) Q2 vs. Q4: OR: 1.07 (0.99–1.16) 3–4 vs. 0 risk factors: Q1 vs. Q4: OR: 1.12 (0.93–1.34) Q2 vs. Q4: OR: 1.02 (0.84–1.24) Q3 vs. Q4: OR: 0.93 (0.77–1.12)	1–2 vs. 0 risk factors: Q1 vs. Q4: OR: 0.96 (0.88–1.04) Q2 vs. Q4: OR: 0.94 (0.87–1.03) Q3 vs. Q4: OR: 1.01 (0.93–1.10) 3–4 vs. 0 risk factors: Q1 vs. Q4: OR: 1.03 (0.89–1.25) Q2 vs. Q4: OR: 0.99 (0.82–1.20) Q3 vs. Q4: OR: 0.99 (0.82–1.20)
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(continued)

**Table 2.1** (continued)

Author(s), location of study site(s)	Study design	Population/setting	Mean age (SD)	Sex (M/W)	Social capital measure	Outcome	Covariates	Analyses	Individual-level effect estimates	Contextual-level effect estimates
Oksanen et al. (2010) Finland	Cohort study (2000– 2005)	25,763 employees working in 10 towns and 21 hospitals	44.4 (NA)	4,631/21,132	Finland eight items Three items for vertical social capital Five items for horizontal social capital <i>Individual level:</i> Q1 (low), Q2, Q3, Q4 (high)	Self-reported, physician diagnosed depression Antidepressant treatment	Sex, age, marital status, socioeconomic position, place of work	Multilevel logistic regression analysis	Vertical social capital Physician diagnosed depression: Q1 vs. Q4: 1.42 (1.20–1.69) Q2 vs. Q4: OR: 1.06 (0.88–1.28) Q3 vs. Q4: OR: 1.00 (0.85–1.18) Antidepressant treatment: Q1 vs. Q4: OR: 1.36 (1.16–1.66) Q2 vs. Q4: OR: 1.17 (0.96–1.42) Q3 vs. Q4: OR: 1.17 (0.99–1.38)	Not applicable

Horizontal social  
capital  
Physician  
diagnosed  
depression:  
Q1 vs. Q4:  
OR: 1.47  
(1.25–1.74)  
Q2 vs. Q4:  
OR: 1.14  
(0.94–1.38)  
Q3 vs. Q4:  
OR: 1.04  
(0.88–1.23)  
Antidepressant  
treatment:  
Q1 vs. Q4  
OR: 1.32  
(1.11–1.58)  
Q2 vs. Q4:  
OR: 1.22  
(1.00–1.48)  
Q3 vs. Q4:  
OR: 1.11  
(0.94–1.32)

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(continued)

**Table 2.1** (continued)

Author(s), (year), location of study site(s)	Study design	Population/setting	Mean age (SD)	Sex (M/W)	Social capital measure	Outcome	Covariates	Analyses	Individual-level effect estimates	Contextual-level effect estimates
Oksanen, Kivimäki, et al. (2011) Finland	Cohort study (2005– 2009)	28,043 employees working in 10 towns and 21 hospitals	45.9 (8.2)	4,956/23,087	The mean of the Finland eight items from the 2 surveys (2000–2002 and mortality 2004) <i>Self-assessed:</i> Continuous variable with a higher value indicating higher social capital <i>Co-workers’ assessment:</i> Continuous variable with a higher value indicating higher social capital	All-cause mortality	Covariates in Cox proportional hazard analysis: position, marital status, smoking, alcohol use, physical alcohol use, physical activity, obesity, psychologi- cal distress, self-rated health, antidepressant prescriptions, chronic illness at baseline Covariates in fixed-effects logistic regression analysis: increase or decrease in psychological distress, self-rated health, or antidepressant use	Cox propor- tional hazard analysis Fixed-effects logistic regression analysis	Cox proportional hazard analysis <i>Self-assessed</i> HR per 1-unit increase: 0.83 (0.67–1.03) <i>Co-workers’ assessment</i> HR per 1-unit increase: 0.77 (0.49–1.21) Fixed-effects analysis OR per 1-unit increase: 0.91 (0.60–1.37)	Not applicable

Oksanen, Kawachi et al. (2011) Finland	Cohort study (2000–2005)	3,515 hypertensive employees working in nine towns and six hospitals	53.9 (6.6) range: 22–66	828/2,687	Finland eight items <i>Self-assessed:</i> Q1 (low), Q2, Q3, Q4 (high) <i>Co-workers' assessment:</i> Q1 (low), Q2, Q3, Q4 (high)	Non-adherence to antihypertensive medication (based on the number of days-not-treated at the year following the survey using comprehensive physical prescription records)	Sex, age, survey year, socioeconomic position, marital status, type of job contract, type of employer, geographical area, duration of hypertension, smoking excess alcohol use, obesity, physical inactivity, comorbid physical illness and depression	Negative binomial regression analysis	<i>Self-assessed</i> Q1 vs. Q4: RR: 1.17 (0.72–1.92) Q2 vs. Q4: RR: 0.85 (0.53–1.38) Q3 vs. Q4: 1.04 (0.62–1.73) <i>Co-workers' assessment</i> Q1 vs. Q4: RR: 0.95 (0.58–1.56) Q2 vs. Q4 RR: 0.92 (0.56–1.52) Q3 vs. Q4: RR: 0.80 (0.48–1.32)	Not applicable
Oksanen et al. (2012) Finland	Cohort study (2000–2005)	60,922 employees working in 10 towns and 21 hospitals	44.1 (NA)	11,777/49,145	Finland eight items <i>Self-assessed:</i> Q1 (low), Q2, Q3, Q4 (high)	Incidence of chronic hypertension	Age, socioeconomic position, marital status, type of employer, employment time, the size, proportion of male employees and geographical location of the work unit, comorbid conditions (diabetes or depression)	Cox proportional hazard analysis	Men <i>Self-assessed</i> Q1 vs. Q4: HR: 1.38 (1.00–1.90) Q2 vs. Q4: HR: 1.03 (0.73–1.47) Q3 vs. Q4: HR: 0.96 (0.67–1.36) <i>Co-workers' assessment</i> Q1 vs. Q4: HR: 1.29 (0.90–1.85) Q2 vs. Q4: HR: 1.17 (0.80–1.70) Q3 vs. Q4: HR: 1.09 (0.73–1.63)	Not applicable

(continued)

**Table 2.1** (continued)

Author(s), location of study site(s)	Study design	Population/setting	Mean age (SD)	Sex (M/W)	Social capital measure	Outcome	Covariates	Analyses	Individual-level effect estimates	Contextual-level effect estimates
Suzuki et al. (2009) Okayama, Japan	Cross-sectional study (2007)	1,105 employees working in 46 companies in Okayama prefecture	NA	781/324	Size of social network at work by asking the number of co-workers in the same company whom they consult with ease on personal issues (one item)	Poor self-rated health	Sex, age, occupational status, education, smoking, alcohol use, blood sugar, high blood pressure, low HDL and/or high triglyceride, social network outside companies	Logistic regression analysis	Medium vs. high: OR: 1.40 (1.00–1.98) Low vs. high: OR: 1.28 (0.81–2.03)	Not applicable
									Women <i>Self-assessed</i> Q1 vs. Q4: HR: 1.10 (0.92–1.31) Q2 vs. Q4: HR: 1.09 (0.91–1.31) Q3 vs. Q4: HR: 1.03 (0.87–1.23) <i>Co-workers’ assessment</i> Q1 vs. Q4: HR: 1.01 (0.84–1.21) Q2 vs. Q4: HR: 1.04 (0.87–1.23) Q3 vs. Q4: HR: 0.92 (0.77–1.09)	

Suzuki, Takao, et al. (2010) Okayama, Japan	Cross sectional study (2007)	1,147 employees working in 46 companies in Okayama prefecture	NA	808/339	<p><i>Individual level:</i></p> <ol style="list-style-type: none"> <li>Trust in the workplace (one item)</li> <li>Reciprocity in the workplace (one item)</li> </ol> <p><i>Company level:</i></p> <ol style="list-style-type: none"> <li>Proportion of workers reporting mistrust (one item)</li> <li>Proportion of workers reporting lack of reciprocity (one item) [self-included measure]</li> </ol>	Poor self-rated health	Sex, age, occupational status, education, smoking, alcohol use, physical activity, BMI, high blood sugar, high blood pressure, low HDL and/or high triglyceride	Multilevel logistic regression analysis (MCMC)	Mistrust vs. trust: OR: 2.31 (1.54–3.46) Lack of reciprocity vs. reciprocity: OR: 2.33 (1.56–3.51)	100 % mistrust vs. 100 % trust: OR: 2.52 (0.51–12.37) 100 % lack of reciprocity vs. 100 % reciprocity: OR: 1.32 (0.32–5.72)
Suzuki, Fujiwara, et al. (2010) Okayama, Japan	Cross sectional study (2007)	1,171 employees working in 46 companies in Okayama prefecture	NA	834/337	<p><i>Individual level:</i></p> <ol style="list-style-type: none"> <li>Trust in the workplace (one item)</li> <li>Reciprocity in the workplace (one item)</li> </ol> <p><i>Company level:</i></p> <ol style="list-style-type: none"> <li>Proportion of workers reporting mistrust (one item)</li> <li>Proportion of workers reporting lack of reciprocity (one item) [self-included measure]</li> </ol>	Current smoking	Sex, age, occupational status, education, alcohol use, physical activity, BMI, high blood sugar, high blood pressure, low HDL and/or high triglyceride	Multilevel logistic regression analysis (MCMC)	Mistrust vs. trust: OR: 0.90 (0.60–1.35) Lack of reciprocity vs. reciprocity: OR: 1.15 (0.79–1.69)	OR per a 1-SD increase of the proportion of mistrust: 1.25 (1.06–1.46) OR per a 1-SD increase of the proportion of lack of reciprocity: 1.06 (0.89–1.24)

(continued)

**Table 2.1** (continued)

Author(s), (year), location of study site(s)	Study design	Population/setting	Mean age (SD)	Sex (M/W)	Social capital measure	Outcome	Covariates	Analyses	Individual-level effect estimates	Contextual-level effect estimates
Sapp et al. (2010) MA, USA	Cross- sectional study (2002)	1,740 employees and 283 managers in 26 manufacturing in Massachusetts	NA	1,170/567 (three missing)	<i>Aggregated individual- level:</i> The Health Behavior Survey (three items) trust, reciprocity, support from manager <i>Contextual-level:</i> Manager survey (four items) cohesion, socializing, support	Current smoking	Sex, age, education, race/ethnicity, language acculturation, occupational status	Multilevel logistic regression analysis	Not applicable	Aggregated social capital: High vs. low: OR: 1.35 (0.84-2.17) High demands×high SC: OR: 0.45 (0.27-0.74) Contextual social capital: High vs. low: OR: 1.15 (0.74-1.79) High demands×high SC: OR: 0.58 (0.35-0.95) Aggregated social capital: High vs. low: OR: 1.37 (0.76-2.50) High strain×high SC: OR: 0.58 (0.27-1.24) Contextual social capital: High vs. low: OR: 1.39 (0.82-2.35) High demands×high SC: OR: 0.54 (0.25-1.16)

Jung et al. (2012) Germany	Cross-sectional study (2009–2010)	328 employees from six companies in the information and communication technology sector	36.5 (10)	238/32 (eight missing)	Social Capital in Organizations Scale (six items) to assess individual-level horizontal social capital Perceived common values Support Cohesion Trust in the organization	Self-reported depressive symptoms (German-version of the World Health Organization Five Item Well-Being Index)	Sex, age, education, spouse/partner status, employment contract, health awareness, job strain	Logistic regression analysis	High vs. low: OR: 0.76 (0.64–0.90)	Not applicable
Helliwell and Huang (2010) Canada	Cross-sectional study	Three Canadian surveys 1. The second wave (2002–2003) of the Equality, Security, and Community (ESC) survey ( $n=1,862$ ) 2. The 2002 post-central Ethnic Diversity Survey (EDS) ( $n$ =confidential) 3) the 2003 General Social Survey (GSS) ( $n=9,949$ )	NA	NA	Canadian ESC: trust in management (0–1 scale) Canadian EDS and GSS: trust in co-workers (0–1 scale)	Life satisfaction (1–10 point scale)	Sex, age, marital status, education, immigration and ethnic information, self-rated health, frequency of contacts with family members outside the household, with friends, and with neighbors, the number of membership in voluntary organizations, trust in general, trust in neighbors, trust or confidence in police, importance of religion, frequency of attending religious services, and in the GSS, a mastery scale as well as satisfaction in various domains outside the workplace	Survey-ordered probit regression	Canadian ESC $\beta=0.56$ , SE=0.11 Canadian EDS $\beta=0.81$ , SE=0.06 Canadian GSS $\beta=0.38$ , SE=0.07 Note: The results of EDS and GSS are not in the paper but they are available upon request from the authors	Not applicable

(continued)

**Table 2.1** (continued)

Author(s), (year), location of study site(s)	Study design	Population/setting	Mean age (SD)	Sex (M/W)	Social capital measure	Outcome	Covariates	Analyses	Individual-level effect estimates	Contextual-level effect estimates
Helliwell and Huang (2011) Canada and USA	Cross- sectional study	Three surveys 1. The second wave (2002–2003) of the Equality, Security, and Community (ESC) survey ( <i>n</i> =2,480) 2. The 2003 General Social Survey (GSS) ( <i>n</i> =8,794) 3. The 2001 US Social Capital Benchmark Survey ( <i>n</i> =13,293)	ESC: 40.49 (10.57) GSS: 39.51 (11.43) Benchma rk: 39.75 (12.08)	NA	Canadian ESC: trust in management (standardized score) Canadian GSS and US benchmark: trust in co-workers (standardized score)	Canadian ESC and GSS: Life satisfaction (1–10 point scale) US benchmark: Happiness (1–4 point scale)	Sex, age, marital status, education, immigration and ethnic information, self-rated health, frequency of contacts with family members outside the household, with friends, and with neighbors, the number of membership in voluntary organizations, trust in general, trust in neighbors, trust or confidence in police, importance of religion, frequency of attending religious services	Survey- ordered probit regression	Canadian ESC $\beta=0.185$ , SE=0.025 Canadian GSS $\beta=0.179$ , SE=0.017 US benchmark $\beta=0.098$ , SE=0.012	Not applicable

*BMI* body mass index, *HDL* high density lipoprotein, *HR* hazard ratio, *MCMC* Markov chain Monte Carlo, *NA* not available, *OR* odds ratio, *SD* standard deviation, *SE* standard error

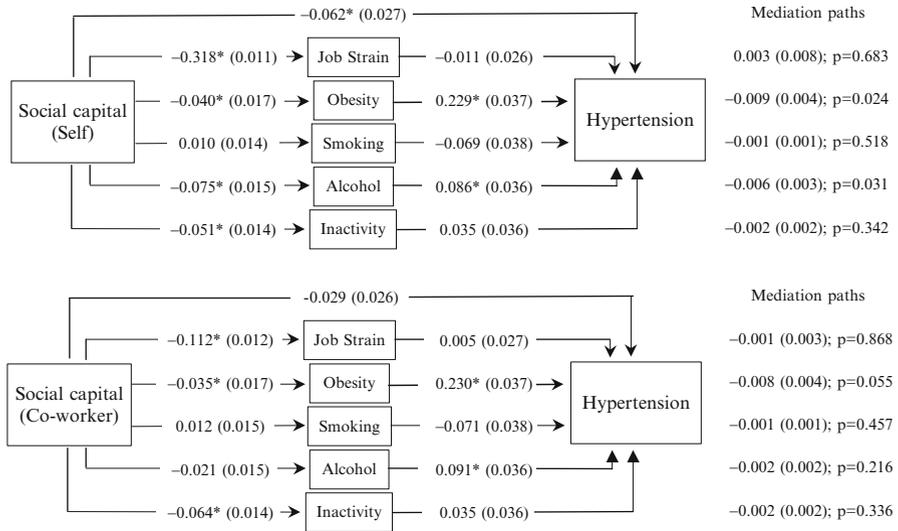
for at least 6 months. The FPSS was initiated in 1990s, and today it is the largest occupational cohort study in Finland. As of 2000, surveys have been conducted every 2–4 years. They have been sent to employees who have been working in the participating organizations at the time of the survey. Approximately 35,000–50,000 employees have responded to each survey, and response rates have varied between 65 % and 70 %. The strengths of this study include large sample size, longitudinal follow-up, the use of validated and reliable instruments that assessed both the cognitive and structural dimensions of social capital, and well-documented health end points. In fact, of the nine multilevel studies, there were five longitudinal studies, all of which were based on this cohort (Kouvonen, Oksanen, Vahtera, Stafford, et al., 2008; Kouvonen, Oksanen, Vahtera, Väänänen, et al., 2008; Oksanen et al. 2008, 2010; Väänänen et al., 2009). For example, Kouvonen, Oksanen, Vahtera, Stafford, et al. (2008) examined the association between workplace social capital and the onset of depression by using the data of 33,577 public sector employees who had no recent history of antidepressant treatment and who reported no history of physician-diagnosed depression at baseline in 2000–2002. They assessed both individual-level and aggregate-level social capital at the workplace by using eight Finnish items—individual-level social capital was the mean of response scores, whereas the aggregate-level social capital of the work unit was calculated as the mean of individual responses of coworkers from the same unit. By using multilevel logistic regression analysis, they separately examined the effects of individual-level social capital and work unit-level social capital. Their findings suggest that low individual-level social capital at work is associated with the onset of depression. However, when they examined the effect of work unit-level social capital, they found no association with depression. In another FPS study, Kouvonen, Oksanen, Vahtera, Väänänen, et al. (2008) targeted a total of 4,853 employees who classed themselves as smokers in the baseline survey and examined whether high social capital at work is associated with an increased likelihood of smoking cessation. Like depression, they found that work unit-level social capital was not associated with smoking cessation, although individual-level higher social capital at work was associated with smoking cessation. Furthermore, Väänänen et al. (2009) examined the link between workplace social capital and the co-occurrence of adverse lifestyle risk factors such as smoking, heavy drinking, physical inactivity, and overweight. Although low work unit-level social capital was associated with an increased risk of co-occurrence of lifestyle risk factors at follow-up, adjustment for co-occurrence and socioeconomic position at baseline considerably attenuated the association. Therefore, these studies did not support the contextual effects of social capital at the workplace.

More recently, three additional reports have been published from this cohort (Oksanen et al., 2012; Oksanen, Kawachi, et al., 2011; Oksanen, Kivimäki, et al., 2011). Although they did not utilize a multilevel analytical approach, these reports nonetheless sought to rigorously examine the effects of individual-level social capital at work by using two different types of measures, i.e., self-reported perceptions of workplace social capital and the mean of coworkers' assessment of social capital in the same work unit. The coworkers' assessment was used to address potential reporting bias, that is, the subject's characteristics that influenced the assessment of social

capital. Oksanen, Kivimäki, et al., (2011) examined the prospective association between workplace social capital and all-cause mortality by using the responses of 28,043 public sector employees to repeat surveys in 2000–2002 and 2004. They collected data on all-cause mortality from the Statistics Finland register for all participants who died between January 1, 2005, and December 31, 2009. After adjusting for potential confounders in Cox proportional hazard models, one-unit increase in the mean of repeated measurements of self-assessed social capital was associated with a 17 % decrease in the risk of all-cause mortality (HR 0.83, 95 % CI 0.67–1.03). The corresponding point estimate for the mean of coworker-assessed social capital was similar (HR 0.77, 95 % CI 0.49–1.21). Crucially, they leveraged the repeated assessment of workplace social capital in their study to conduct a fixed effects analysis. This analytical approach offers the advantage of controlling for the stable characteristics of the individuals, whether measured or not, by using within-individual variation only to estimate the regression coefficients (see Chap. 4 for a detailed discussion). In fixed effects analysis, a one-unit increase in self-assessed social capital across the two time points was also associated with a lower mortality risk, which was not statistically significant but yielded an effect estimate that was very close to the Cox regression estimates (OR 0.81, 95 % CI 0.55–1.19). Adjustment for changes in health indicators between the two time points attenuated the association (OR 0.91, 95 % CI 0.60–1.37).

In a separate study, Oksanen et al. (2012) examined the association between workplace social capital and the incidence of chronic hypertension (determined from record linkage to national health registers) among 11,777 male and 49,145 female employees who were free of hypertension at baseline. During a follow-up of a mean of 3.5 years, men in work units reporting the lowest workplace social capital were at approximately a 40 % excess risk of becoming diagnosed with hypertension compared to men working in units with the highest workplace social capital (HR 1.38, 95 % CI 1.00–1.90). This association was slightly attenuated when they used coworkers' assessment (HR 1.29, 95 % CI 0.90–1.85). In contrast, no association was found between workplace social capital and incident hypertension among female employees. Further, Oksanen, Kawachi, et al. (2011) examined the association between workplace social capital and adherence to antihypertensive medication among 3,515 hypertensive employees in the same cohort. Survey responses to social capital were linked to nationwide pharmacy records. Non-adherence to antihypertensive medication was determined based on the number of days-not-treated during the year following the survey, found from comprehensive prescription records. Except for the association between workplace social capital and incident hypertension among men, no relationship was found between workplace social capital and adherence to antihypertensive medication.

The authors went further to elucidate the pathways linking workplace social capital and hypertension among men. Although it is claimed that social capital in neighborhoods as well as at workplaces is causally associated with population health, little is known about what the etiological pathways might be. One often claimed notion is that behavioral health risks mediate the associations. Structural equation models were fitted for self-reported and coworker-assessed workplace



**Fig. 2.1** Analysis of mediation pathways in the association between social capital and hypertension in men

social capital to partition the total association into direct and indirect associations. Among men, obesity accounted for 12 % of the association between self-reported social capital and hypertension. The fact that obesity also emerged as a marginally significant mediator in the association for coworker-assessed social capital further supports the status of obesity as a mediator for workplace social capital to hypertension (Fig. 2.1). These results contribute to research on the worldwide epidemic of obesity and hypertension by providing new evidence of obesity as a modifiable factor mediating the association between workplace social capital and health (Siervo, Wells, & Stephan, 2012).

Importantly, of the nine studies on workplace social capital and health using multilevel analyses, only two Japanese studies have examined the contextual effect of workplace social capital by controlling for individual perceptions of social capital at the workplace (Suzuki, Fujiwara, et al., 2010; Suzuki, Takao, et al., 2010). When researchers find an association between work unit- or company-level social capital and employees’ health, they cannot rule out the possibility that the association reflects residual compositional confounding by individual characteristics if they do not simultaneously adjust for individual perceptions of social capital at work. To address this, Suzuki, Takao, et al. (2010), in a cross-sectional study, examined the association between workplace social capital and self-rated health among Japanese private sector employees. Through a two-stage stratified random sampling procedure, they identified 1,147 employees from 46 companies in Okayama prefecture. In this study, workplace social capital was measured through two components: trust and reciprocity. Company-level social capital was measured by aggregating employee responses and calculating the proportion of workers reporting mistrust

and lack of reciprocity (i.e., self-included measure<sup>1</sup>). The researchers used multi-level logistic regression analysis via the Markov chain Monte Carlo methods to explore whether individual- and company-level mistrust and lack of reciprocity were associated with poor self-rated health. Workers reporting individual-level mistrust and lack of reciprocity were approximately twice as likely to suffer from poor health, even after controlling for possible confounders. Notably, they found some suggestion of a contextual association between company-level mistrust and poor health, even after taking into account the individual coworkers' perceptions of mistrust. These results suggest that both individual- and company-level perceived trust at workplaces are significant for workers' health independently. Despite the thorough examination of cross-level interaction terms between company-level social capital and individual characteristics, no clear patterns were observed. When Suzuki, Fujiwara, et al. (2010) examined the association between workplace social capital and smoking status, using the same data set, they found that company-level mistrust was associated with higher likelihood of smoking, whereas individual perceptions of mistrust were not. Thus, these two studies suggest that the contextual effects of workplace social capital in Japan are significant. Given the limitation resulting from their cross-sectional manner, further studies are warranted to examine the contextual effects of workplace social capital in longitudinal studies.

Finally, it is worthwhile mentioning that of the 17 studies, one Finnish cohort study examined the vertical component (i.e., respectful and trusting relationships across power differentials at work) and the horizontal component (i.e., trust and reciprocity between employees at the same hierarchical level) of workplace social capital as risk factors for subsequent depression (Oksanen et al., 2010). This study found that employees with either low vertical or horizontal social capital were 30–50 % more likely to be diagnosed with depression or to start antidepressant treatment than their counterparts with high social capital, thus suggesting that both these components may be relevant to employee well-being. We expect, however, that further research will identify dimensions of workplace social capital that either positively or negatively affect health outcomes in different cultural or economic settings.

### ***2.4.2 Findings Regarding Workplace Social Capital and Health in Medical Settings***

Table 2.2 provides details of seven studies of workplace social capital and health in medical settings, two of which used particular problems in medical settings as

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<sup>1</sup>When using multilevel analyses in social capital research, individual variables are usually aggregated into the higher level unit to define group-level social capital. Typically, the aggregated measure includes responses of every individual belonging to that group (i.e., it constitutes a self-included measure). More recently, researchers have developed an aggregate measure which excludes the response of the individual to whom the aggregate measure is linked (i.e., a self-excluded measure). For details about the substantive and technical properties of these two measures, see Suzuki, Yamamoto, Takao, Kawachi, and Subramanian (2012).

**Table 2.2** Summary of 7 studies of workplace social capital and health in medical settings

Author(s), location of study site(s)	Study design	Population/setting	Mean age (SD)	Sex(M/W)	Social capital measure	Outcome	Covariates	Analyses	Individual-level effect estimates	Contextual-level effect estimates
Virtanen et al. (2009) Finland	Cross-sectional study (2004)	1,092 patients in 60 non- psychiatric bed wards in six hospitals	NA	NA	<i>Ward-level:</i> From 1, 159 staff survey responses, the mean of indicators of collaboration in each ward was calculated: Trust between ward members communica- tion, justice in the distribution of work, support from supervisor, and quality of the collaboration between supervisors in the ward	Hospital- associated infection among patients	Patients sex, age, surgical status, exposure to devices, hospital type, unit type, number of patients at ward, use of corticosteroids, and prevalence of any diagnosis/ treatment related to immunodefi- ciency	Logistic analysis (GEE)	Not applicable	Trust between ward members Intermediate vs. high: OR: 1.92 (1.02–3.62) Low vs. high: OR: 2.67 (1.42–5.02) Communication Average vs. good: OR: 1.81 (1.00–3.27) Poor vs. good: OR: 1.80 (0.98–3.33) Justice in the distribution of work Intermediate vs. high: OR: 1.76 (0.99–3.14) Low vs. high: OR: 1.81 (1.04–3.16) Support from supervisor Average vs. good: OR: 0.83 (0.38–1.83) Poor vs. good: OR: 1.25 (0.66–2.34) Collaboration between ward supervisors Average vs. good: OR: 1.68 (0.93–3.06) Poor vs. good: OR: 2.46 (1.38–4.38)

(continued)

**Table 2.2** (continued)

Author(s), location of study site(s)	Study design	Population/setting	Mean age (SD)	Sex(M/W)	Social capital measure	Outcome	Covariates	Analyses	Individual-level effect estimates	Contextual-level effect estimates
Chen et al. (2008) Taiwan	Cross-sectional study (2005)	229 high- and middle-level female managers in 17 hospitals	38.6	0/229	Individual-level social capital (four items) 1. Mentor help promotion 2. Number of mentors in career 3. Relational ties with the significant mentor 4. Same gender of the most significant mentor	Current poor self-rated health Self-rated health change from the previous year	<i>Individual-level:</i> Age, marital status, education, job tenure division chairwoman, work department, perception-induced stress <i>Hospital-level:</i> Hospital ownership, hospital types	Multilevel ordinal regression analysis	<p>Poor self-rated health</p> <p>1. Mentor help promotion Yes vs. no: <math>\beta=0.75</math>, SE=0.37, <math>p=0.04</math></p> <p>2. Number of mentors in career (ref: <math>\leq 1</math> mentor) 2 mentors: <math>\beta=-0.57</math>, SE=0.44, <math>p=0.20</math> 3 mentors: <math>\beta=-0.59</math>, SE=0.69, <math>p=0.39</math> <math>\geq 4</math> mentors: <math>\beta=-0.81</math>, SE=0.46, <math>p=0.08</math></p> <p>3. Relational ties with the significant mentor (ref: coworker) Division supervisor: <math>\beta=0.12</math>, SE=0.40, <math>p=0.76</math> Supervisor in different division: <math>\beta=-0.26</math>, SE=0.58, <math>p=0.65</math></p> <p>4. Same gender of the most significant mentor Yes vs. no: <math>\beta=-0.10</math>, SE=0.42, <math>p=0.82</math></p> <p>Health change</p> <p>1. Mentor help promotion Yes vs. no: <math>\beta=0.37</math>, SE=0.37, <math>p=0.33</math></p> <p>2. Number of mentors in career (ref: <math>\leq 1</math> mentor) 2 mentors: <math>\beta=0.22</math>, SE=0.45, <math>p=0.63</math> 3 mentors: <math>\beta=0.56</math>, SE=0.72, <math>p=0.44</math> <math>\geq 4</math> mentors: <math>\beta=0.49</math>, SE=0.47, <math>p=0.31</math></p> <p>3. Relational ties with the significant mentor (ref: coworker) Division supervisor: <math>\beta=-0.13</math>, SE=0.41, <math>p=0.75</math> Supervisor in different division: <math>\beta=-0.15</math>, SE=0.43, <math>p=0.72</math></p> <p>4. Same gender of the most significant mentor Yes vs. no: <math>\beta=-0.15</math>, SE=0.43, <math>p=0.72</math></p>	Not applicable

Ernstmann et al. (2009) Germany	Cross-sectional study (2002–2003)	959 nurses working in four hospitals Corporate Governance Using Biopsychosocial Indicators (CoBI) study	37.58 (9.76)	112/843 (four missing)	Six items to assess two key features of social capital: 1. Common values 2. Perceived trust at the hospital	Clinical risk management among nursing staff of hospitals (six-item scale)	Sex, age, years of professional experience, surgical care unit, level of care of the hospital	Pearson correlation coefficient Multiple regression analysis	Correlation coefficient between social capital and clinical risk management: 0.472 Social capital was significantly associated with higher clinical risk management in the final model (no estimates were reported).	Not applicable
Ommen et al. (2009) Germany	Cross-sectional study (2002)	277 clinicians working in four hospitals Corporate Governance Using Biopsychosocial Indicators (CoBI)	40.0 (9.9)	163/114	Six items to assess two key features of social capital: 1. Common values 2. Perceived trust at the hospital	Job satisfaction (one item)	Sex, age, years of professional experience, workload	Pearson coefficient Multiple linear regression analysis	Correlation coefficient between social capital and job satisfaction: 0.524 ( $p < 0.01$ ) Social capital was significantly associated with higher job satisfaction in the final model	Not applicable
Kowalski, Ommen et al. (2010) Germany	Cross-sectional study (2002)	959 nurses working in four hospitals Corporate Governance Using Biopsychosocial Indicators (CoBI) study	38.0 (9.8)	112/843 (four missing)	Six items to assess two key features of social capital: 1. Common values 2. Perceived trust at the hospital	Emotional exhaustion based on Maslach Burnout Inventory -General Survey (MBI-GS) (five items)	Sex, age, years of professional experience, job tenure, workload, decision latitude	Logistic regression analysis	OR per 1-unit increase: 0.549 (0.403–0.746)	Not applicable

(continued)

**Table 2.2** (continued)

Author(s), location of study site(s)	Study design	Population/setting	Mean age (SD)	Sex (M/W)	Social capital measure	Outcome	Covariates	Analyses	Individual-level effect estimates	Contextual-level effect estimates
Kowalski, Driller, et al. (2010) Germany	Cross-sectional study (2005–2006)	175 caregiving and pedagogical staff of German services Demands and Social Network—Opportunities in the Care for the Disabled (INA Study)	41.9 (9.8)	63/109 (three missings)	Six items to assess two key features of social capital: 1. Common values 2. Perceived trust at the hospital	Emotional exhaustion based on Maslach Burnout Inventory—General Survey (MBI-GS) (five items)	Sex, age, years of professional experience, job tenure, workload, decision latitude	Logistic regression analysis	OR per 1-unit increase: 0.559 (0.290–1.077)	Not applicable
Driller et al. (2011) Germany	Cross-sectional study (2002)	277 clinicians working in four hospitals Corporate Governance Using Biopsychosocial Indicators (CoBI) study	40.0 (9.9)	163/114	Six items to assess two key features of social capital: 1. Common values 2. Perceived trust at the hospital Social capital was grouped by performing median split in logistic regression analysis.	Emotional exhaustion based on Maslach Burnout Inventory—General Survey (MBI-GS) (five items)	Sex, age, marital status, years of professional experience, hospital, self-efficacy	Logistic regression analysis	Low vs. high: OR: 1.62 (1.10–2.30)	Not applicable

GEE generalized estimating equation, NA not available, OR odds ratio, SD standard deviation, SE standard error

outcomes (Ernstmann et al., 2009; Virtanen et al., 2009). A Finnish study examined the association between ward-level collaboration among ward staff as indicated by trust between work unit members (horizontal social capital) and the risk of hospital-associated infection among patients, demonstrating a beneficial effect even after adjusting for hospital factors and patient-related risk factors (Virtanen et al., 2009). Another study from Germany suggested that higher individual-level social capital among nurses is beneficial for integrating clinical risk management into their daily work (Ernstmann et al., 2009). The remaining five studies examined the effect of individual-level social capital on emotional exhaustion (Driller, Ommen, Kowalski, Ernstmann, & Pfaff, 2011; Kowalski, Driller, et al., 2010; Kowalski, Ommen, et al., 2010), job satisfaction (Ommen et al., 2009), and self-rated health (Chen, Lin, & Chung, 2008). Overall, these studies have found that individual-level social capital at the workplace has beneficial effects on these health outcomes.

## **2.5 Cross-National Comparison of Workplace Social Capital: Japan and Finland**

The short measure developed, validated, and frequently used in the Finnish Public Sector cohort (Kouvonen et al., 2006) was translated into Japanese in 2009 at the University of Tokyo. Two Japanese versions were made, one from English to Japanese and the other from Finnish to Japanese, using a translation company and a native Finnish expert. The researchers compared each item of both versions and made a tentative Japanese version and an English back-translated questionnaire from the Japanese version. After several consultations with the Finnish researchers, the Japanese version of the short measure of social capital was finalized.

Researchers from Okayama University in Japan used the Japanese translation of this measure in a survey conducted in a company providing call center services in northeast Japan (an area not severely damaged by the earthquake and tsunami in Japan on March 11, 2011). This made cross-national comparison possible. By looking at data from a cross-national perspective, this investigation is intended to help understand the extent to which this measure of workplace social capital captures the essence of the social relationships in workplaces in different countries and how much they are influenced by employee characteristics.

The Japanese data were gathered in a company which employs 1,193 operators who work in 53 teams; division into teams was based on client companies. The survey was administered to 598 randomly selected employees in May 2011, and 560 (69 % women, mean age 33.4 years) people from 52 teams responded (response rate 94 %).

Then, to allow for best possible comparativeness between the countries, the Finnish participants were sourced from kindergartens. Kindergartens were considered to best represent team-based work organizations in the Finnish public sector. A total of 4,639 members of staff in 452 kindergartens responded to a survey between September and November, 2008 (response rate 73 %). Of the respondents, we excluded those who were not involved in the caretaking of children organized as

teams ( $n=369$ ) leaving 4,270 employees (98 % women, mean age 44.0 years) in the final sample. In both countries, the workplace social capital measure showed good psychometric properties concerning their reliability (Japan: Cronbach's  $\alpha=0.92$ , Finland: Cronbach's  $\alpha=0.86$ ).

### ***2.5.1 Results from Cross-National Comparisons***

There was a slight difference between the countries in the degree of similarity in perceptions of workplace social capital among members of the same work unit. The intraclass correlation coefficient (ICC) estimating the degree of resemblance in individual perceptions of workplace social capital was 13 % in the Japanese sample and 20 % in the Finnish sample. The ICC provides information on the resemblances of individual responses within work units (Diez Roux, 2002). Thus, an employee's perception of social capital at work resembled that of his/her coworkers in the same kindergarten in Finland more strongly than in the teams in the Japanese call center. This indicates that either something about the work units themselves was inherently different or that individuals working in the same work unit or team were more similar to each other. It is, however, noteworthy that previously reported ICCs in non-work contexts have been substantially lower. For example, in a study of neighborhood-level social capital collective efficacy and violent crime in Chicago, ICC was 7.5 % (Sampson, Raudenbush, & Earls, 1997).

The observed levels of workplace social capital and its components tended to be higher in the Finnish sample (Table 2.3). Specifically, in Finland, employees reported higher total social capital at work than their counterparts in Japan (observed means were 3.94 vs. 3.78). Although the sample sizes were different, the sample standard deviations (SD) were similar (SD 0.64 vs. 0.66). The means of horizontal and vertical workplace social capital were 3.83 and 4.13 in Finland and 3.71 and 3.90 in Japan.

Looking at workplace social capital by item showed that in both countries the highest scores were observed in information sharing ("People keep each other informed about work-related issues in the work unit") and in items describing relationships between the supervisor and employee ("Our supervisor treats us with kindness and consideration," "Our supervisor shows concerns for our rights as an employee," and "We can trust our supervisor"), whereas the lowest scores were related to perceptions about cooperation in the work unit.

### ***2.5.2 Individual-Level Correlates of Workplace Social Capital by Country***

We further sought to understand the interplay between individual characteristics and workplace social capital and how this might vary between Finland and Japan. At the individual level, social capital is believed to be determined by factors such as

**Table 2.3** Mean scores of individual-level workplace social capital by item in Finland and Japan

	Finnish ( <i>n</i> =4,270)	Japanese ( <i>n</i> =560)
	Mean (SD)	Mean (SD)
Workplace social capital	3.94 (0.64)	3.78 (0.66)
<i>Horizontal social capital at work</i>	3.83 (0.69)	3.71 (0.69)
People keep each other informed about work-related issues in the work unit	4.12 (0.73)	3.87 (0.78)
We have a “we are together” attitude	3.99 (0.90)	3.81 (0.82)
People feel understood and accepted by each other	3.74 (0.93)	3.64 (0.80)
People in the work unit cooperate in order to help develop and apply new ideas	3.65 (0.91)	3.60 (0.84)
Do members of the work unit build on each other’s ideas in order to achieve the best possible outcome?	3.64 (0.81)	3.62 (0.85)
<i>Vertical social capital at work</i>	4.13 (0.88)	3.90 (0.76)
Our supervisor treats us with kindness and consideration	4.17 (0.93)	3.92 (0.81)
Our supervisor shows concern for our rights as an employee	4.13 (0.95)	3.92 (0.79)
We can trust our supervisor	4.10 (1.03)	3.85 (0.89)

*SD* standard deviation

education, socioeconomic status (SES), and employment status. Therefore, we investigated age, sex, SES, and type of job contract as correlates of workplace social capital. The choice of these variables was mainly determined by availability in both datasets. Furthermore, being healthy may be an important prerequisite for cooperation at the workplace. Still, causality is likely to be bidirectional; for example, participating in social activities at the workplace may also promote better health. Therefore, self-rated health was imported to the data from surveys. In the analysis, we used multilevel linear regression models in which individuals were at level 1 and work units at level 2 (Tables 2.4 and 2.5).

In the Finnish kindergartens, employees in higher SES groups and over 50 years of age had higher workplace social capital and horizontal social capital than that reported by younger coworkers in lower SES groups. There were no differences between men and women. Better health was associated with higher workplace social capital and especially with higher vertical social capital in the workplace. In the Japanese call center, younger age was related to higher vertical social capital at work. In Japan, men tended to have higher social capital, in all aspects, than women. SES and type of job contract did not play a major role in reporting of social capital. In both countries, health was a significant correlate of workplace social capital and its components.

### 2.5.3 What Do These Comparisons Indicate?

The levels of workplace social capital were higher in the Finnish kindergartens, where employees perceived more social capital at work than the employees in the Japanese call center. In addition, the perceptions of individual employees in Finland

**Table 2.4** Mean scores of workplace social capital by correlates in Finland (4,270 employees in 425 kindergartens) and Japan (560 employees in 52 call center teams)

	Finland		Japan	
	<i>N</i>	Mean (SE) <sup>a</sup>	<i>N</i>	Mean (SE) <sup>a</sup>
Age (years)		$p < 0.0001$		$p = 0.09$
<40	1,340	3.91 (0.04)	417	3.80 (0.06)
40–50	1,745	3.96 (0.04)	115	3.66 (0.08)
>50	1,185	4.02 (0.04)	28	3.64 (0.13)
Sex		$p = 0.48$		$p = 0.003$
Men	100	3.98 (0.06)	172	3.87 (0.06)
Women	4,170	3.94 (0.02)	388	3.67 (0.06)
Socioeconomic status		$p < 0.0001$		$p = 0.30$
Upper	267	4.10 (0.05)	0	
Middle	1,659	3.89 (0.04)	182	3.80 (0.06)
Lower	2,344	3.90 (0.04)	378	3.74 (0.05)
Job contract		$p = 0.15$		$p = 0.09$
Permanent	3,816	3.94 (0.04)	99	3.71 (0.07)
Other	454	3.99 (0.04)	461	3.83 (0.05)
Self-rated health		$p < 0.0001$		$p = 0.004$
Good	3,459	4.07 (0.04)	431	3.87 (0.05)
Poor	787	3.86 (0.04)	129	3.67 (0.07)

SE standard error

<sup>a</sup>Adjusted for age, sex, socioeconomic status, job contract, and self-rated health**Table 2.5** Mean scores of horizontal and vertical workplace social capital by country and correlates

	Finland		Japan	
	Horizontal	Vertical	Horizontal	Vertical
	Mean (SE) <sup>a</sup>	Mean (SE) <sup>a</sup>	Mean (SE) <sup>a</sup>	Mean (SE) <sup>a</sup>
Age (years)	$p < 0.0001$	$p = 0.69$	$p = 0.15$	$p = 0.03$
<40	3.75 (0.04)	4.18 (0.05)	3.72 (0.06)	3.91 (0.06)
40–50	3.84 (0.04)	4.16 (0.05)	3.61 (0.08)	3.72 (0.08)
>50	3.92 (0.04)	4.18 (0.05)	3.54 (0.13)	3.71 (0.15)
Sex	$p = 0.72$	$p = 0.36$	$p = 0.02$	$p = 0.0005$
Men	3.85 (0.07)	4.21 (0.08)	3.77 (0.07)	4.00 (0.07)
Women	3.83 (0.03)	4.14 (0.03)	3.62 (0.06)	3.74 (0.06)
Socioeconomic status	$p < 0.0001$	$p = 0.02$	$p = 0.13$	$p = 0.89$
Upper	4.02 (0.05)	4.24 (0.07)	–	–
Middle	3.72 (0.04)	4.17 (0.05)	3.74 (0.07)	3.88 (0.07)
Lower	3.77 (0.04)	4.12 (0.05)	3.65 (0.05)	3.87 (0.06)
Job contract	$p = 0.72$	$p = 0.001$	$p = 0.17$	$p = 0.04$
Permanent	3.84 (0.04)	4.11 (0.05)	3.64 (0.08)	3.78 (0.08)
Other	3.83 (0.05)	4.24 (0.06)	3.75 (0.05)	3.96 (0.06)
Self-rated health	$p < 0.0001$	$p < 0.0001$	$p = 0.006$	$p = 0.005$
Good	3.94 (0.04)	4.28 (0.05)	3.79 (0.07)	3.98 (0.06)
Poor	3.73 (0.04)	4.07 (0.06)	3.59 (0.05)	3.77 (0.08)

SE standard error

<sup>a</sup>Adjusted for age, sex, socioeconomic status, job contract, and self-rated health

were closer to those of their coworkers than in Japan. These findings may reflect differences in the organization of work, in the shared values that guide day-to-day work, and in the probabilities of employees interacting with each other. For example, in the Japanese call center, division into teams is based on client companies. In practice, this means that social interaction between teams is rare. Of course, the differences may simply reflect compositional or unmeasured differences between the samples and we need to be cautious in the interpretation of the findings.

In both countries, the horizontal aspect of workplace social capital which captures the intra- and intergroup relations at the workplace was best manifested in items assessing shared norms of reciprocity, measured by perceptions of keeping each other informed about work-related issues, and social cohesion and connectedness, measured from perceptions of a united attitude at the workplace. Smaller differences were observed in items measuring vertical social capital. However, in Japan, men perceived higher workplace social capital and especially higher vertical social capital than women. In Japan, prevailing traditional power structures mean that vertical social capital is still largely accessed by men. This means that measuring female social capital at the workplace level may underestimate the total amount of vertical social capital in a Japanese work community.

There was no consistent pattern as to which correlates were associated with social capital in country comparisons, except for health. Those with better health had higher scores of both vertical and horizontal social capital at work. However, cross-sectional data does not permit verification of the direction of the effect. Furthermore, although we accounted for these differences in the analyses, we were only able to take a limited set of potential confounders into account in the models.

### ***2.5.4 What Can We Learn from These Findings?***

First, the levels of workplace social capital were reasonably high in both samples, indicating that social capital can provide an important resource for these workplaces. From the employee's perspective, the workplace is a natural site for the accumulation of social capital. Employees feel a sense of community and enjoy mutual help and reciprocity in their jobs (Putnam, 2000). Moreover, workplace social capital can mean access to social connections that help the processes of getting by or getting ahead (Stone & Hughes, 2002). From the employer's perspective, social capital provides a potential resource since it encourages and motivates regular collaborative contacts among peers and between employees and their supervisors. These contacts and connections are potential resources as they offer the employees and their organizations information and credit of various kinds. Thus, workplace social capital reflects the ability of its members to participate, cooperate, organize, and interact. Moreover, social capital offers benefits to organizations by improving knowledge flow due to existing trust, cooperation, and shared values (Prusak & Cohen, 2001). Trust cannot simply materialize: it evolves through processes that embody high levels of interaction, transparency, and foreseeable action. For example, high social capital means that employees can trust that things work

out as planned and feel that their expertise is valued. Furthermore, supervisors can express trust in their subordinates by ensuring that the division of labor follows fair opportunities to use personal skills. However, trust at the workplace may also be a consequence rather than a facet (Putnam, 2001; Woolcock, 2001). Finally, the theory posits that social capital is productive, making it possible to achieve certain ends that are not attainable in its absence (Coleman, 1990).

Second, in the Finnish kindergartens, the level of workplace social capital was higher than that reported in prior studies comprising employees from the whole Finnish Public Sector cohort, for example, those working in hospitals, schools, and administrative offices (Oksanen et al., 2012). This suggests that there may be something specific in kindergartens that is beneficial to the development of workplace social capital. Much of the work in kindergartens is hands-on and done in teams divided according to the ages of the children. At the same time, it involves a specified set of joint tasks, such as eating together and taking the children outside to play, thereby encouraging frequent interaction between coworkers. Alternatively, the explanation may be that the natural aptitude of kindergarten teachers for working with children is reflected in their way of interacting with the whole work community. Furthermore, the level of vertical social capital was relatively high. Kindergartens can be vertically highly organized in general: sometimes they have a strong pre-school policy proposed by the chief manager or school board. Alternatively, the ability to enable the redistribution of resources, ideas, and information is a key function of vertical social capital. In kindergartens, these resources may be leveraged to create effective educational methods thereby creating vertical social capital.

Third, many researchers have called for greater emphasis to be placed on attempts to distinguish between the different dimensions of social capital and their association with health outcomes (Kawachi, Kim, Coutts, & Subramanian, 2004). Based on the data from these two workplaces, it is equally as important to strengthen vertical social capital as it is to focus on horizontal social capital. Without vertical social capital connecting employees to supervisors and leaders to resources, social networks, norms, and trust may not actually be able to improve any aspect of well-being in a work community. In addition, without horizontal links, important information channels, support channels, or other benefits of solidarity will be lost.

Finally, cross-cultural and cross-national comparisons require the use of a uniform measure of workplace social capital. Although it has been questioned whether such measures can be constructed that are locally and contextually relevant, at the same time allowing for cross-cultural comparability (Krishna & Shrader, 2000), there is a clear need for a tool that accounts for the different dimensions and components of social capital among a wide range of community.

## 2.6 Conclusions

This chapter describes the recent extension of social capital research from residential and geographical areas into workplaces. Workplaces provide a significant basis of relational context—one of the contextual triads—among working populations

(Suzuki, 2012). However, research into workplaces is only emerging in the field of social capital. Studies have been conducted in a handful of countries and a few settings. It is therefore too early to draw any definite conclusion about the associations with health.

Further longitudinal studies are needed to investigate data from a larger variety of countries, jobs, and occupations. Many researchers have called for a greater emphasis being placed on attempts to distinguish between the different dimensions, aspects, and components of social capital and their associations with health outcomes. This also applies to social capital at the workplace. More studies are needed to explore horizontal and vertical social capital at workplaces and their associations with mental and physical illness and recovery.

To date, most of social capital studies at the workplace have measured the cognitive aspect of workplace social capital only. The cognitive aspect of social capital refers to what people “believe” and the structural component what people “do.” Thereby, *cognitive* social capital covers aspects related to beliefs, attitudes, and values such as trust, solidarity, and reciprocity that are shared among members of the same community or work unit. *Structural* social capital, in turn, represents the extent and intensity of associational links or activity. So far, the structural component has included aspects related to the practices of collective action and exchanges of information at the workplace. Future studies might find innovative ways to measure the structural component objectively, for example, by estimating time spent at cooperation and coordination enhancing utilization of available resources. Furthermore, future studies of workplace social capital may benefit from alternative approaches of measurement such as social network mapping to clarify which configuration of workplace social capital is likely to affect workers’ health (Lakon, Godette, & Hipp, 2008).

Workplace policies increasingly let workers engage themselves in community work to promote collective action and social cohesion. These work–community interactions deserve more attention in future studies. Indeed, employers are able to influence factors that produce workplace social capital (Siervo et al., 2012).

Ideally, social capital at the workplace may provide an avenue for health promotion and for tackling increasing social and geographical inequalities in health among the working population (Krieger et al., 2008; Mackenbach et al., 2008; Suzuki, Kashima, Kawachi, & Subramanian, 2012; Thomas, Dorling, & Davey-Smith, 2010). However, intervention studies are needed in order to confirm or refute this hypothesis.

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