

# Developing Behavioral Theory With the Systematic Integration of Community Social Capital Concepts

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## Abstract

Health behavior theories state that social environments influence health behaviors, but theories of *how* this occurs are relatively underdeveloped. This article systematically surveys community social capital concepts in health behavior literature and proposes a conceptual framework that integrates these concepts into existing behavioral theory. Fifty-three studies tested associations between community social capital concepts and physical activity (38 studies), smoking (19 studies), and diet (2 studies). Trustworthiness of community members was consistently associated with more health-promoting and less disease-promoting behaviors in 19 studies. Neighborly reciprocity showed mixed results in 10 studies. Reporting a good sense of community was associated with more physical activity in only 5 of 16 studies. Neighborhood collective efficacy, which includes social cohesion and informal social control, was inconsistently associated with behaviors in 22 studies. Behavioral social norms were associated with smoking and physical activity in 2 of 6 studies, and neighborhood modeling of physical activity was associated with increased activity in 12 of 17 studies, with 1 opposing result. This review identifies several community social capital–related concepts that are, at times, associated with both health-promoting and disease-promoting behaviors and often have no associations. Theory explains these findings by describing the relationships and interactions among these concepts. Using these findings, this article proposes a conceptual framework that integrates community social capital concepts into existing behavioral theory. Iterative empirically based theory development is needed to address these concepts, which affect behaviors. These results can also inform theoretically based community-based and socially tailored interventions.

## Keywords

community, health behavior, neighborhood, social capital, social cohesion, social determinants, trust

Health behavior theories state that social environments influence health behaviors, but theories of *how* this occurs are relatively underdeveloped. As examples, behavioral theorists and interventionists use numerous individual-level constructs such as attitudes, intentions, and self-efficacy (McAlister, Perry, & Parcel, 2008; Montaña & Kasprzyk, 2008), but few social-level constructs, such as collective efficacy (McAlister et al., 2008). A PubMed search produced 27,636 results for self-efficacy but only 161 for collective efficacy. Also, theories, such as social cognitive theory and theory of planned behavior, presume that behavior change is predicated largely by individual cognitive processes (Bandura, 1989; Montaña & Kasprzyk, 2008), ignoring social forces, such as socialization to group norms, which act via noncognitive pathways (Ryder, 1965; Singh-Manoux & Marmot, 2005). Such limitations have prompted a call for greater integration of social constructs and pathways in behavioral theories and interventions (Burke, Joseph, Pasick, & Barker, 2009; Glass & McAtee, 2006).

Community social capital, one aspect of social environment that is gaining attention, is a multidimensional construct that has been defined and operationalized in numerous different ways (discussions of this can be found in Brunie, 2009; Hawe & Shiell, 2000; Lochner, Kawachi, & Kennedy, 1999; Macinko & Starfield, 2001; Wilkinson, 2007). This article will rely on definitions of Bourdieu (1986) and Coleman (1988), who both understand social capital to be resources in social networks that are useful for an individual to enact behaviors. These conceptualizations highlight the function of

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social networks, rather than size or other structural characteristics (Bourdieu, 1986; Coleman, 1988; Kawachi & Berkman, 2000). Social capital varies by setting but may include access to information or behavioral norms, freedom to trust other group members, or ability to expect supportive help from others (Coleman, 1988; Portes, 1998). Availability of social capital depends on the social cohesion (Bourdieu, 1986) and collective efficacy (Bandura, 2000; Sampson, Raudenbush, & Earls, 1997) of the group, which help the group achieve common goals, and social capital and social cohesion are often used interchangeably. Therefore, social capital is best understood in relation to these other concepts.

A growing body of evidence has established a relationship between community social capital and health behaviors. A handful of physical activity studies were described in reviews of community environments (McNeill, Kreuter, & Subramanian, 2006; Wendel-Vos, Droomers, Kremers, Brug, & van Lenthe, 2007), but there has been no systematic survey of the numerous operationalizations of community social capital. Also, although community social capital may, theoretically, contribute to both health-promoting behaviors, such as physical activity, fruit and vegetable consumption, and smoking cessation, *and* disease-promoting behaviors, such as smoking (Carpiano, 2006; Moore, Daniel, Gauvin, & Dube, 2009; Portes, 1998), there has been no summary of results. Additionally, empirical findings can be situated within a wealth of theoretical literature from sociology and social epidemiology that can inform integration of these concepts into existing behavioral theories. This integrated knowledge will expand our understanding of *how* community social capital influences health behaviors and can be used to socially tailor community-based interventions.

## Purpose

The purposes of this article are to (a) systematically survey the empirical use of community social capital concepts to identify and define concepts related to health behaviors and (b) propose a testable conceptual framework that integrates the concepts into existing behavioral theory based on both empirical and theoretical literature.

## Method

A systematic literature search without date restriction was conducted with librarian consultation in PubMed, Web of Knowledge, PsychInfo, Sociological Abstracts, CINAHL, and Scopus in April 2011. Peer-reviewed studies published in English reporting summary statistic(s) for the relationship between specific neighborhood or community social capital concept(s) and health-promoting behavior (smoking cessation, engaging in physical activity, and consuming a healthy diet) or disease-promoting behavior (smoking status and smoking initiation) were included in the review, and postintervention results were excluded. Search terms included concepts that are

used interchangeably with social capital, or closely related concepts. Studies defining social capital according to structure of social networks, rather than the function of networks, or as a multidimensional concept, were excluded from review. See the appendix for details. Empirically used concepts were identified, and results were categorized by operational definitions and abstracted accordingly, based on consensus from two authors (LS, YCM). Operational definitions, based on instruments in empirical studies, were matched with theoretical definitions from theoretical literature. Then, theoretical literature was used to derive a conceptual framework.

## Results

Sixty-two articles from 53 studies were identified. All but 11 studies (Evenson, Sarmiento, Tawney, Macon, & Ammerman, 2003; Fisher, Li, Michael, & Cleveland, 2004; Hume, Jorna, et al., 2009; F. Li, Fisher, & Brownson, 2005; Loucaides, 2009; Lundborg, 2005; Mota, Almeida, Santos, & Ribeiro, 2005; Rohm & Voorhees, 2003; Thompson, Wolfe, Wilson, Paredilla, & Perez, 2003; Voorhees & Rohm, 2003; Wilbur, Chandler, Dancy, & Lee, 2003a, 2003b) used random sampling, and all but 6 studies (Cleland, Timperio, & Crawford, 2008; Craddock, Kawachi, Colditz, Gortmaker, & Buka, 2009; Ennett et al., 2010; Giordano & Lindstrom, 2011; Hume, Timperio, et al., 2009; F. Li et al., 2005; Pabayo, Belsky, Gauvin, & Curtis, 2010) were cross-sectional. Although the majority of studies were conducted in urban settings and in the United States, no notable pattern in results emerged according to rural versus urban differences or across the 13 countries.

Studies examined relationships between community social capital concepts and physical activity (38 studies), smoking behaviors (19 studies), and fruit and vegetable intake (2 studies; Tables 1 and 2). Six studies presented only crude associations (Lindstrom, 2009; Loucaides, 2009; Rohm & Voorhees, 2003; Thompson et al., 2003; Wilbur et al., 2003a, 2003b), but the rest adjusted for individual sociodemographic characteristics and/or health status, and most adjusted for neighborhood characteristics, such as socioeconomic status, safety, or presence of stores or parks. Notably, community social capital concepts were associated with decreased health-promoting or increased disease-promoting behaviors in several population-based samples, including U.S. adolescents (Kim, Liu, Colabianchi, & Pate, 2010; Musick, Seltzer, & Schwartz, 2008), Taiwanese adults (Chuang & Chuang, 2008), Dutch older adults (Kamphuis et al., 2009), and a predominately Hispanic female sample (Carpiano, 2007, 2008; Kim et al., 2010).

Figure 1 demonstrates community social capital concepts identified in the literature, extending an existing model of theory of planned behavior (Montaño & Kasprzyk, 2008). This conceptual framework is one example of integrating these concepts into existing behavioral theory, although other approaches could be accomplished. Based on theory, Figure 1 presents community social capital concepts at a

**Table 1.** Summary of Association Between Community Social Capital Concepts and Community Collective Efficacy Concepts With Health-Promoting Behaviors.

Article	Sample	Multilevel	Trustworthiness	Neighborhood Reciprocity	Sense of Community	Collective Efficacy	Social Control	Social Cohesion
Physical activity								
Total physical activity								
Addy et al. (2004), Wilson, Ainsworth, and Bowles (2007)	1,270 U.S. adults ≥ 18 years	N	+					
Ainsworth, Wilcox, Thompson, Richter, and Henderson (2003)	917 U.S. Black women 20-50 years	N			0			
Cradock et al. (2009)	680 U.S. adolescents 11-15 years	Y						+
Deshpande, Baker, Lovegreen, and Brownson (2005)	274 U.S. diabetic adults	N	0	0	0			0
Duke, Borowsky, and Pettingell (2010)	Representative 64,076 U.S. children 6-17 years	N	+	+				
Evenson, Sarmiento, Tawney, Macon, and Ammerman (2003)	671 U.S. Hispanic female immigrants 20-50 years	N			0			
Greiner, Li, Kawachi, Hunt, and Ahluwalia (2004)	4,601 U.S. adults	Y			+			
Hooker, Wilson, Griffin, and Ainsworth (2005)	1,165 U.S. adults ≥ 18 years	N	B:0 W:0					
Hume, Jorna, et al. (2009)	764 Australian adolescents 9-12 years	N						+
Kim, Liu, Colabianchi, and Pate (2010)	Representative 13,668 U.S. adolescents, Grades 7-12	Y					+ / - <sup>a</sup>	
Morgan and Haglund (2009)	Representative 6,425 U.K. adolescents 11-15 years	N	0				0	
Pabay, Belsky, Gauvin, and Curtis (2010)	889 U.S. adolescents 10-15 years	N						+
Poortinga, (2006b)	Representative 14,836 English adults ≥ 16 years	Y	0	0	0			
Rohm and Voorhees (2003)	234 U.S. Black women 20-50 years	N			0			
Sanderson et al. (2003)	567 U.S. women 20-50 years	N			0			
Thompson, Wolfe, Wilson, Pardilla, and Perez (2003)	350 Native American women 20-50 years	N			0			
Ueshima et al. (2010)	2260 Japanese adults 20-80 years	N	+					
Voorhees and Rohm (2003)	285 U.S. Hispanic females 20-50 years	N			0			
Wen, Browning, and Cagney (2007)	907 U.S. adults ≥ 18 years	Y	0	0				

(continued)

Table 1. (continued)

Article	Sample	Multilevel	Trustworthiness	Neighborhood Reciprocity	Sense of Community	Collective Efficacy	Social Control	Social Cohesion
Wilbur, Chandler, Dancy, and Lee (2003a)	399 U.S. Black women 20-50 years	N			0			
Wilbur, Chandler, Dancy, and Lee (2003b)	300 U.S. Hispanic females 20-50 years	N			0			0
Leisure physical activity Ball, Cleland, et al. (2010)	1,405 Australian women 18-65 years	Y	+	0				+
Cleland et al. (2010)	4,108 Australian low-income women 18-45 years	Y						
Transport physical activity Cleland et al. (2010)	4,108 Australian low-income women 18-45 years	Y						0
Hume, Timperio, et al. (2009)	309 Australian 8-9 years and 13-15 years	N						0
Salmon, Salmon, Crawford, Hume, and Timperio (2007)	720 Australian children 4-13 years	N	0					
Walking Addy et al. (2004), Wilson et al. (2007)	1,270 U.S. adults ≥18 years	N	0					0
Ball, Cleland, et al. (2010)	1,405 Australian women 18-65 years	Y	0	0				0
Echeverria, Diez-Roux, Shea, Borrell, and Jackson (2008)	5,943 U.S. multiethnic adults 45-85 years	Y						+ / 0 <sup>b</sup>
Fisher, Li, Michael, and Cleveland (2004)	582 U.S. adults ≥65 years	Y						+
Hooker et al. (2005)	1,165 U.S. adults ≥18 years	N						+
Hume, Jorna, et al. (2009)	764 Australian adolescents 9-12 years	N	B:0 W:0					
Kamphuis et al. (2009)	1,994 Dutch adults 55-75 years	Y			0			-
F. Li, Fisher, and Brownson (2005)	303 U.S. adults ≥65 years	Y						0
Mendes de Leon et al. (2009)	4,317 U.S. adults ≥65 years	Y						0 / + <sup>a</sup>
Poortinga (2006b)	Representative 14,836 English adults ≥16 years	Y	+	0	0			
Wen, Kandula, and Lauderdale (2007)	41,545 U.S. adults ≥18 years	Y						+ W:+ H:+ B:0 A:0

(continued)

**Table 1. (continued)**

Article	Sample	Multilevel	Trustworthiness	Neighborhood Reciprocity	Sense of Community	Collective Efficacy	Social Control	Social Cohesion
Leisure walking Cleland, Timperio, and Crawford (2008)	357 Australian mothers	N	+ / + <sup>c</sup>	+ / 0 <sup>c</sup>				+ / + <sup>c</sup>
du Toit, Cerin, Leslie, and Owen (2007) <sup>d</sup>	2,194 Australian adults	Y			+			
Wood, Frank, and Giles-Corti (2010) <sup>d</sup>	609 U.S. adults 20-70 years	N			+			
Transport walking Cleland et al. (2008)	357 Australian mothers	N	0 / 0 <sup>c</sup>	0 / 0 <sup>c</sup>	0			+ / 0 <sup>c</sup>
Hume, Timperio, et al. (2009)	309 Australian 8-9 years and 13-15 years	N						
Deforche, Van Dyck, Verloigne, and De Bourdeaudhuij (2010)	1,445 Belgian adolescents	Y			+			
du Toit et al. (2007) <sup>d</sup>	2,194 Australian adults	Y			+			
McDonald (2007)	614 U.S. youth 5-18 years	Y				+ / 0 <sup>e</sup>	+	
McDonald, Deakin, and Aalborg (2010)	357 U.S. adolescents 10-14 years	N						
Sports participation Deforche et al. (2010)	1,445 Belgian adolescents	Y			0			
Kamphuis et al. (2008)	3,839 Dutch adults, 25-75 years	Y			+			+
Poortinga (2006b)	Representative 14,836 English adults ≥ 16 years	Y	+	0	0			
Smoking cessation Giordano and Lindstrom (2011)	Representative 10,512 U.K. adults	N	+ / 0 / 0 <sup>f</sup>					
Lindstrom (2009)	27,757 Swedish adults	N	M: + F: +					
Fruit and vegetable intake Morgan and Haglund (2009)	Representative 6425 U.K. adolescents 11-15 years	N	Fruit: 0 Vegetable: 0				Fruit: + Veg: 0	
Poortinga (2006a)	Representative 7,394 English adults ≥ 16 years	Y	+	+				

Note. Fully adjusted models were chosen when possible, but interaction terms were avoided to allow comparison. Also, in studies that presented more than one way to characterize the outcome, the study is described here as having significant findings if any of the results were significant. Multilevel refers to any use of statistical analyses that accounts for community clustering of responses. + = positive association; - = negative association; 0 = null association. For stratified results, M = male, F = female, B = Black, W = White, H = Hispanic, A = Asian.

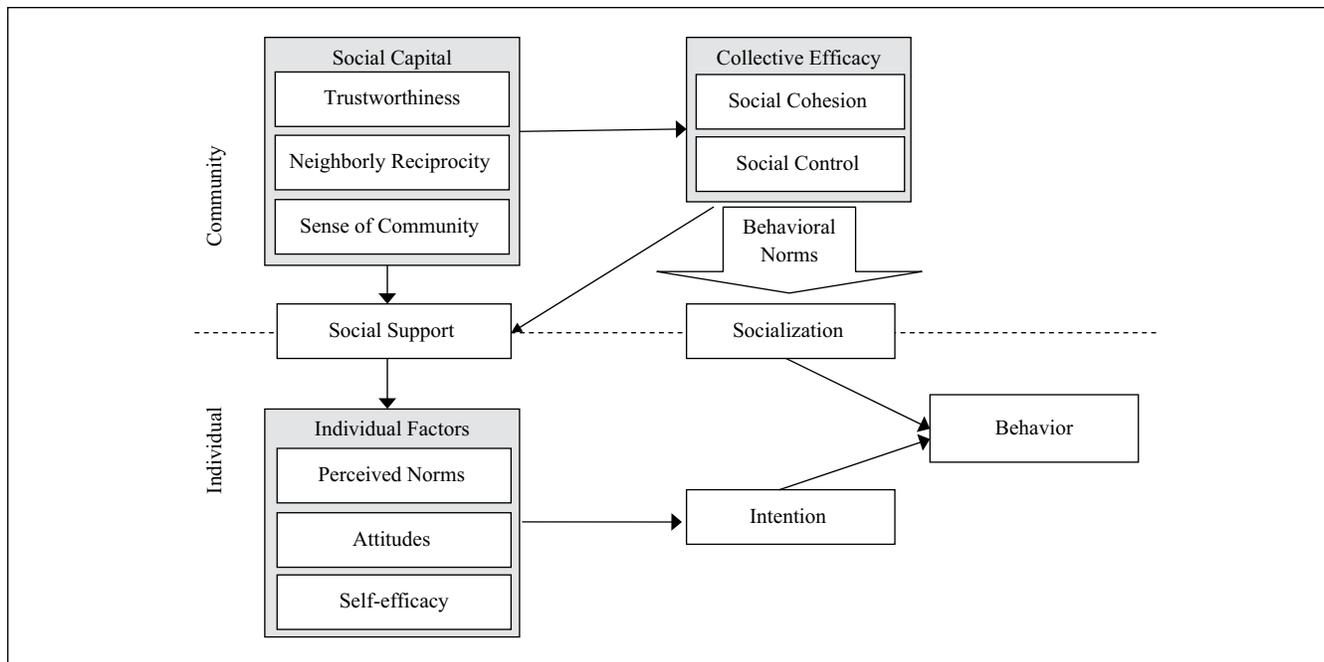
<sup>a</sup>These results represent the social variable measured at the individual and neighborhood levels, respectively, in the same model. <sup>b</sup>These results represent the social variable measured at the individual and neighborhood levels, respectively, in separate models. <sup>c</sup>Results are for baseline and 2-year change in behavior, respectively. <sup>d</sup>Walking is the independent variable in this study. <sup>e</sup>Results are for short-distance commutes and long-distance commutes, respectively. <sup>f</sup>Results correspond to increased trust, stable, and decreased trust, respectively.

**Table 2.** Summary of Association Between Community Social Capital Concepts and Community Collective Efficacy Concepts With Disease-Promoting Behaviors.

Article	Sample	Multilevel	Trustworthiness	Neighborhood Reciprocity	Sense of Community	Collective Efficacy	Social Control	Social Cohesion
<b>Smoking</b>								
Current smoking								
Afifi, Nakkash, and Khawaja (2010)	1,716 Lebanese low-income married women 15-59 years	N	-					
Ahern, Galea, Hubbard, and Syme (2009)	4,000 U.S. adults ≥18 years	Y				0 / 0 <sup>a</sup>		
Carpiano (2007)	2,076 U.S. adults	Y		+			-	-
Carpiano (2008)	730 U.S. female caregivers	Y		+			0	0
Chuang and Chiung (2008)	3,713 Taiwanese adults ≥20 years	Y						0 / +a; 0 / 0 <sup>b</sup>
Echeverría, Díez-Roux, Shea, Borrell, and Jackson (2008)	5,943 U.S. multiethnic adults 45-85 years	Y	- / -a; - / 0 <sup>b</sup>					0
Greiner, Li, Kawachi, Hunt, and Ahluwalia (2004)	4,601 U.S. adults	Y			-			
Kandula, Wen, Jacobs, and Lauderdale (2009)	4,407 Asian American adults ≥18 years	Y						M: - F: 0
Lindstrom (2003)	12,426 Swedish adults	N	M: - F: -					
Lindstrom (2009)	27,757 Swedish adults	N	M: - F: -					
Lundborg (2005)	1,330 Swedish adolescents 12-18 years	Y	-					
Morgan and Haglund (2009)	Representative 6,425 U.K. adolescents 11-15 years	N	-				0	
Musick, Selzer, and Schwartz (2008)	890 U.S. adolescents 12-17 years	Y					+ <sup>c</sup>	
Patterson, Eberly, Ding, and Hargreaves (2004)	10,062 U.S. adults	Y						- / - <sup>b</sup>
Poorthinga (2006b)	Representative 14,836 English adults ≥16 years	Y	-	-				
Sapag et al. (2010)	680 low-income Chilean adults ≥18 years	N	-	0				
Siahpush et al. (2006)	2,762 Australian adults ≥18 years	Y	0 / - <sup>b</sup>	0 / 0 <sup>b</sup>				
Smoking initiation								
Ennett et al. (2010)	6,544 U.S. adolescents Grades 6-8	Y					0	0
Giordano and Lindstrom (2011)	Representative 10,512 U.K. adults	N	0/0 <sup>d</sup>					

Note. Fully adjusted models were chosen when possible, but interaction terms were avoided to allow comparison. Also, in studies that presented more than one way to characterize the outcome, the study is described here as having significant findings if any of the results were significant. Multilevel refers to any use of statistical analyses that accounts for community clustering of responses. + = positive association; - = negative association; 0 = null association. For stratified results, M = male, F = female.

<sup>a</sup>These results represent the social variable measured at the individual and neighborhood levels, respectively, in separate models. <sup>b</sup>These results represent the social variable measured at the individual and neighborhood levels, respectively, in the same model. <sup>c</sup>Neighborhoods with high social control and low adult disapproval had increased rates of smoking, whereas neighborhoods with high social control and high adult disapproval had decreased rates of smoking. <sup>d</sup>Results correspond to increased trust, stable, and decreased trust, respectively.



**Figure 1.** Conceptual framework integrating community social capital, community collective efficacy, and behavioral norms into behavioral theory.

Note. Adapted from the theory of planned behavior, taken from Montaño and Kasprzyk (2008).

community level (Bourdieu, 1986; Coleman, 1988; Kawachi & Berkman, 2000; Szreter & Woolcock, 2004). Twenty-five reviewed studies statistically accounted for potential clustering of community social capital values, as shown in Tables 1 and 2. As the tables show, some of them were able to detect differences in inferences, when comparing individual social capital responses to aggregated mean responses, supporting the theoretical proposition that social capital exists at the community level (Bourdieu, 1986; Coleman, 1988).

The conceptual model proposes that components of community social capital, such as trustworthiness, neighborhood reciprocity, and sense of community, operate via two main pathways to affect behavior. First, it is thought to provide access to social support, (Chaix, 2009; Kawachi & Berkman, 2000; Portes, 1998), which influences behaviors via cognitive factors such as self-efficacy (Berkman & Glass, 2000; Heaney & Isreal, 2008; House, Umberson, & Landis, 1988). Since social support and individual-level factors are well addressed elsewhere (Ajzen, 1991; Bandura, 1977; McAlister et al., 2008; Montaño & Kasprzyk, 2008), this article will not elaborate on this pathway. Only one reviewed study supported this pathway, showing that the combined effect of self-efficacy, outcome expectancies, intentions, and physical activity enjoyment and skills accounted for some of the association between social cohesion and social control with physical activity (Cleland et al., 2010). However, several studies adjusted for either self-efficacy (Deforche, Van Dyck, Verloigne, & De Bourdeaudhuij,

2010; Fisher et al., 2004; Y. J. Li et al., 2005) or social support (Poortinga, 2006a; Poortinga, 2006b), and some found associations (Tables 1 and 2), suggesting that this mechanism is not the sole pathway between community social capital and health behaviors.

A second theorized pathway between community social capital and health behaviors is socialization (Chaix, 2009; Portes, 1998), a process in which individuals adapt their behaviors to align with the norms of their community social networks (Ryder, 1965; Singh-Manoux & Marmot, 2005). Socialization cannot be assumed to operate via cognitive pathways that characterize existing behavioral theories (Burke et al., 2009), so Figure 1 proposes a separate pathway. However, despite the premise that socialization has greatest influence on individuals who self-identify as social network members, relatively few reviewed studies controlled for individual’s integration in community social networks (Afifi, Nakkash, & Khawaja, 2010; Ahern, Galea, Hubbard, & Syme, 2009; Ball, Cleland, et al., 2010; Carpiano, 2007, 2008; Chuang & Chuang, 2008; Deforche et al., 2010; Echeverria, Diez-Roux, Shea, Borrell, & Jackson, 2008; Giordano & Lindstrom, 2011; Hume, Jorna, et al., 2009; Kim et al., 2010; Mendes de Leon et al., 2009; Morgan & Haglund, 2009; Pabayo et al., 2010; Poortinga, 2006a, 2006b; Siahpush et al., 2006; Wood, Frank, & Giles-Corti, 2010). One of the few theoretically based studies found that such integration modified the relationship between social capital and smoking (Carpiano, 2008), indicating that studies should address individual community integration.

### Trustworthiness

Trustworthiness undergirds all relationships. In communities, the ability to trust neighbors fosters a free exchange of resources (Coleman, 1988; Portes, 1998) and improves collective efficacy (Kawachi & Berkman, 2000; Figure 1). As an important caveat, theory suggests that group homogeneity and/or shared history (Szreter & Woolcock, 2004) and frequent interaction (Y. J. Li, Pickles, & Savage, 2005) are necessary ingredients for trustworthiness, and this may be lacking in communities with residential instability or segregation. Only six studies measuring trustworthiness addressed participant's integration (Afifi et al., 2010; Ball, Cleland, et al., 2010; Chuang & Chuang, 2008; Giordano & Lindstrom, 2011; Morgan & Haglund, 2009; Poortinga, 2006b), and none addressed historical or sociopolitical contexts.

Trustworthiness was generally associated with increased health-promoting behaviors and decreased disease-promoting behaviors in 19 studies (Tables 1 and 2), although a Taiwanese study found statistically significant results among women only (Chuang & Chuang, 2008). However, measurement was generally weak. Ten studies simply asked if people in the neighborhood could be trusted, 7 asked if people in general could be trusted (Ball, Cleland, et al., 2010; Giordano & Lindstrom, 2011; Lindstrom, 2003, 2009; Lundborg, 2005; Poortinga, 2006a, 2006b), and 2 combined questions about whether neighbors could be trusted and relied on for help (Duke, Borowsky, & Pettingell, 2010; Morgan & Haglund, 2009).

### Neighborly Reciprocity

Neighborhoods vary according to the level of help and support that is expected for members to provide to each other. This concept, neighborly reciprocity, should, theoretically, allow individuals to expect social support (Bourdieu, 1986; House et al., 1988; Figure 1). Neighborly reciprocity was measured by 10 studies, usually with only one or two questions, (i.e., willingness to help each other and/or look out for each other), which were specific to neighbors in all but one study (Ball, Cleland, et al., 2010). Two studies measured reciprocity with either four (Duke et al., 2010) or five (Sapag et al., 2010) questions, and one study only asked if neighbors would help maintain walking trails (Deshpande, Baker, Lovegreen, & Brownson, 2005). Results show generally either a null or a positive association with health-promoting behaviors and negative association with disease-promoting behaviors (Tables 1 and 2), although in one predominately Hispanic female sample, neighborly reciprocity was associated with *increased* smoking (Carpiano, 2007, 2008; Table 2).

### Sense of Community

Sense of community is less strictly defined than other social capital concepts but is thought to represent a caring

commitment of community members, which gives neighbors a sense of belonging (McMillan & Chavis, 1986) and group identity (Bourdieu, 1986). Sense of community should, therefore, be linked with social support (Heaney & Isreal, 2008; Figure 1). Also, individuals who feel like they belong to a community are likely to adhere to the community's behavioral norms, even if they promote disease, such as encouraging social smoking or excessive drinking (Etzioni, 2000), so a second pathway is proposed via socialization leading to health behaviors (Figure 1).

Sixteen studies sought to determine if individuals perceiving their neighborhoods to have a good sense of community engage in more health-promoting behaviors. A pattern emerged in physical activity results (Table 1), according to the operationalization of sense of community. Four studies simply queried if the neighborhood is a good place to live (Deshpande et al., 2005; Greiner, Li, Kawachi, Hunt, & Ahluwalia, 2004; Hume, Timperio, et al., 2009; Poortinga, 2006b), and three studies added two to five questions about attachment and commitment to people in the neighborhood (Deforche et al., 2010; du Toit, Cerin, Leslie, & Owen, 2007; Wood et al., 2010). These all generally found positive associations with physical activity. One study examined individuals' sense of belonging to their community, rather than perception of the community itself, which was associated with sports activity overall, but not with walking, in a subsample of older adults (Kamphuis et al., 2008, 2009). The remainder of the studies used yet another instrument, which queried if the neighborhood is a good place to live and if neighbors and law enforcement could be counted on for help, which was not significantly associated with physical activity.

### Community Collective Efficacy (Social Control and Social Cohesion)

Collective efficacy is a concept used in social cognitive theory to describe a groups' ability to achieve goals (Bandura, 2000; McAlister et al., 2008), and is related to, but separate from, social capital (Kawachi & Berkman, 2000), so it is represented as a different box in Figure 1. Neighborhood collective efficacy is a combination of social cohesion, or solidarity among neighbors to establish common goals, and informal social control, or the willingness of neighbors to intervene for the common good and leverage relationships to pursue common goals (Kawachi & Berkman, 2000; Sampson et al., 1997). Collective efficacy is fostered by long-term trusting relationships built on reciprocal help and positive interactions (Sampson et al., 1997), and social cohesion of the community facilitates access to social capital (Bourdieu, 1986), so the framework in Figure 1 proposes that social capital predicates community collective efficacy.

Collective efficacy likely influences health behaviors through several mechanisms. Neighborhood social cohesion provides access to social support (Berkman & Glass, 2000; Heaney & Isreal, 2008). Also, socialization requires

a cohesive social network that has informal control over member's behaviors (Etzioni, 2000; Singh-Manoux & Marmot, 2005), and social control can impose informal sanctions, such as isolation, on individuals who stray from community network normative behaviors (Etzioni, 2000; Sunstein, 1996) even if they are disease-promoting behaviors (House et al., 1988). Therefore, Figure 1 proposes that socialization arises from collective efficacy. Indeed, one reviewed study found no association between smoking norms and smoking overall, but adolescents were less likely to smoke if adults disapproved only in neighborhoods with high social control (Musick et al., 2008), suggesting that enforcement of norms depends on social control in the community. In addition, collective efficacy facilitates collective action (Bandura, 2000; Sampson et al., 1997) and may indirectly increase health-promoting behaviors through coordinated actions that promote health (Kawachi & Berkman, 2000; Uchino, 2004). For example, neighbors may work together to make streets safe for walking, take political action to regulate tobacco sales, or organize a farmers' market to ensure access to produce, which could produce community-level behavior change. Although there is evidence elsewhere of behavior change across social groups (Christakis & Fowler, 2007, 2008), only one reviewed study assessed behavior prevalence (Chen et al., 2010).

Two studies examined collective efficacy, another 17 studies examined social cohesion, and 5 studies examined social control (Tables 1 and 2). Most studies used a common instrument for neighborhood collective efficacy, which has social cohesion and informal social control subscales (Sampson et al., 1997). The social cohesion questionnaire asks if the neighborhood is close-knit and if neighbors get along together, share the same values, and are trustworthy and helpful. The social control questions focus on whether adults in the neighborhood would intervene in various situations, focusing on children's disruptive behavior.

The results for both social control and social cohesion were not consistent, and the direction of association may differ for neighborhood aggregated mean scores than for individual responses for social control (Kim et al., 2010) and social cohesion (Chuang & Chuang, 2008; Tables 1 and 2). Interestingly, in a Taiwanese sample, where over half of men smoked, social cohesion was positively associated with smoking (Chuang & Chuang, 2008). Also, in a predominantly Hispanic female sample, community integration modified the effect of social control on smoking, so in neighborhoods with low social control, integration was associated with increased odds of smoking, whereas the opposite was true in neighborhoods with high social control (Carpiano, 2008), indicating that the effect of social control may depend on how an individual interacts with his or her environment. Several studies tested for interactions between sex and either social cohesion (Hume, Jorna, et al., 2009; Pabayo et al., 2010) or social control (Kim et al., 2010), but only one physical activity outcome showed a stronger association among

males (Pabayo et al., 2010), indicating that these inconsistent results are not attributable to gender. However, one study found an interaction between neighborhood collective efficacy and smoking norms, so that collective efficacy was associated with decreased likelihood of smoking if neighborhoods were perceived as antismoking but increased likelihood of smoking if neighborhoods were perceived as prosmoking (Ahern et al., 2009).

### Behavioral Norms

Social norms supporting particular behaviors strongly influence an individual's health behavior by shaping attitudes via socialization (Berkman & Glass, 2000; Etzioni, 2000; Figure 1). Empirical results suggest that behavioral norms influence health behaviors via socialization pathways rather than social support pathways, since neither self-efficacy (Thompson et al., 2003) nor support for activity (Ball, Jeffery, Abbott, McNaughton, & Crawford, 2010) mediated the relationship between behavioral norms and physical activity in reviewed studies. Since behavioral norms are actually the messages transmitted by social capital, rather than social capital itself, they are shown as arrows. Six studies examined the relationship between behavioral norms and either physical activity or smoking using different operational definitions (Table 3).

Modeling of health behaviors is a key concept in social cognitive theory, since observing a peer modeling a behavior may influence an individual's behavior (McAlister et al., 2008). Community modeling could be a proxy for behavioral norms because it indicates social acceptability of the behavior (Chaix, 2009). Community modeling was measured in 17 studies by simply asking respondents if other people in their neighborhood walked, were physically active, or smoked, except for one study that asked several questions about smoking behaviors (Ennett et al., 2010). As Table 3 demonstrates, modeling was generally associated with increased likelihood of engaging in the behavior. Surprisingly, in one urban Hispanic female sample, women were *less* likely to be physically active if they saw neighbors being active (Voorhees & Rohm, 2003). This was not corroborated in similar Hispanic female samples (Evenson et al., 2003; Wilbur et al., 2003b).

### Discussion

This review contributes to the literature by identifying community social capital concepts used in empirical studies, including trustworthiness, neighborly reciprocity, and sense of community. These results provide unique empirical evidence to support previously theorized relationships between community social capital concepts and health behaviors, showing that social capital, collective efficacy, and behavioral norms are associated, at times, with both health-promoting and disease-promoting behaviors, though many studies had null findings. This review also found that many

**Table 3.** Summary of Associations Between Community Behavioral Norms and Health-Promoting Behaviors and Disease-Promoting Behaviors.

Article	Sample	Multilevel	Behavioral Norm Measurement	Results
<b>Physical activity</b>				
Total physical activity				
Addy et al. (2004), Wilson, Ainsworth, and Bowles (2007)	1,270 U.S. adults ≥18 years	N	Modeling	0
Ainsworth, Wilcox, Thompson, Richter, and Henderson (2003)	917 U.S. Black women 20-50 years	N	Modeling	+
Deshpande, Baker, Lovegreen, and Brownson (2005)	274 U.S. diabetic adults	N	“People in community have the same values”	0
Evenson et al. (2003)	671 U.S. Hispanic female immigrants 20-50 years	N	Modeling	+
Hooker, Wilson, Griffin, and Ainsworth (2005)	1,165 U.S. adults ≥18 years	N	Modeling	B: 0; W: +
Loucaides (2009)	652 Cypriot middle school students	N	Modeling	+
Mota, Almeida, Santos, and Ribeiro (2005)	1,123 Portuguese adolescents Grades 7-12	N	Modeling	0
Rohm and Voorhees (2003)	234 U.S. Black women 20-50 years	N	Modeling	0
Sanderson et al. (2003)	567 U.S. women 20-50 years	N	Modeling	+
Thompson, Wolfe, Wilson, Pardilla, and Perez (2003)	350 Native American women 20-50 years	N	Modeling	+
Voorhees and Rohm (2003)	285 U.S. Hispanic females 20-50 years	N	Modeling	-
Wilbur, Chandler, Dancy, and Lee (2003b)	300 U.S. Hispanic females 20-50 years	N	Modeling	+
Wilbur, Chandler, Dancy, and Lee (2003a)	399 U.S. Black women 20-50 years	N	Modeling	0
<b>Leisure physical activity</b>				
Ball, Jeffery, Abbott, McNaughton, and Crawford (2010)	3,610 Australian low-income women 18-45 years	Y	Modeling	+
Hoehner, Brennan Ramirez, Elliott, Handy, and Brownson (2005)	1,053 U.S. adults ≥18 years, high- and low-income areas	N	(a) Count of people being active in the neighborhood (b) Modeling	(a) 0 (b) 0
Lee (2007)	438 U.S. “able-bodied” adults	N	Modeling	+
<b>Transport physical activity</b>				
Hoehner et al. (2005)	1,053 U.S. adults ≥18 years, high- and low-income areas	N	(a) Count of people being active in the neighborhood (b) Modeling	(a) + (b) 0
Lee (2007)	438 U.S. “able-bodied” adults	N	Modeling	0

(continued)

**Table 3. (continued)**

Article	Sample	Multilevel	Behavioral Norm Measurement	Results
Walking Addy et al. (2004), Wilson, Ainsworth, and Bowles (2007) Ball, Jeffery, et al. (2010)	1,270 U.S. adults ≥ 18 years 3,610 Australian low-income women 18-45 years 1,165 U.S. adults ≥ 18 years	N Y N	Modeling Modeling Modeling	+ + B: 0 W: +
Smoking Hooker, Wilson, Griffin, and Ainsworth (2005) Current smoking Ahern, Galea, Hubbard, and Syme (2009)	4,000 U.S. adults ≥ 18 years	Y	(a) Perceived neighborhood smoking acceptability (b) Neighborhood mean perceived smoking (c) Perceived neighborhood smoking prevalence (d) Modeling	(a) + (b) + (c) + (d) +
Chen et al. (2010)	22,339 Taiwanese junior high students	N/A <sup>a</sup>	(a) City adult male smoking prevalence (n = 16,688) (b) City adult female smoking prevalence (n = 16,688)	(a) 0 (b) 0
Musick, Seltzer, and Schwartz (2008)	890 U.S. adolescents 12-17 years	Y	(a) Neighborhood adult smoking prevalence (b) Neighborhood mean adult disapproval of adult smoking	(a) 0 (b) 0
Smoking initiation Ennett et al. (2010) Frohlich, Potvin, Gauvin, and Chabot (2002)	6,544 U.S. adolescents Grades 6-8 694 Canadian adolescents 11-14 years	Y Y	Modeling (a) Proportion of organizations who inform about antismoking products or the hazards of smoking (b) Prevalence of smoking bans	+ (a) 0 (b) 0

Note. Fully adjusted models were chosen when possible, but interaction terms were avoided to allow comparison. Also, in studies that presented more than one way to characterize the outcome, the study is described here as having significant findings if any of the results were significant. Multilevel refers to any use of statistical analyses that accounts for community clustering of responses. + = positive association, - = negative association, 0 = null association, and for stratified results, B = Black, W = White.

<sup>a</sup>This study analyzed area-level data for both behavioral norms and behavioral outcomes.

studies could be strengthened by theoretical grounding. This article contributes by proposing that community social capital concepts be integrated into existing behavioral theory and by providing a testable conceptual framework to address this gap.

The seemingly inconsistent associations between community social capital and collective efficacy concepts with health behaviors do not appear to be attributable to study setting, since community social capital concepts were associated with adverse health behaviors in several large population-based samples (Carpiano, 2007; Chuang & Chuang, 2008; Kamphuis et al., 2009; Kim et al., 2010; Musick et al., 2008). However, it is interesting to note that all but one of these studies (Chuang & Chuang, 2008) were conducted in samples who may not necessarily identify with the dominant community social culture, including Hispanic females, older adults, and adolescents. Similarly, some concepts in this review were significantly associated with health behaviors in Whites, but not minorities, in stratified analyses. Although this may be attributable to reduced power, this may actually represent differential effect of community social capital for certain subgroups. Certainly, subcultures socialize differently from the dominant community culture, and null results may mask subgroup differences. Theory suggests that results may differ for marginalized subgroups, who are excluded from socialization (Portes, 1998). This review found that many studies failed to control for individuals' integration into their community group, which may affect the findings. Community social capital is more accessible to individuals who interact with neighbors (Bourdieu, 1986), and only individuals who self-identify as members of a community social network will be socialized to the community's behavioral norms (Etzioni, 2000). Future studies should consider an individual's integration into community social networks.

Alternatively, behavioral norms may differ across subgroups, altering the association between social capital or collective efficacy and health behaviors. In reviewed studies, behavioral norms were associated with behaviors, even if they promote disease, and two reviewed studies showed that behavioral norms interact with collective efficacy concepts. Theories suggest that social cohesion provides access to behavioral norms and that informal social control enforces adherence to those norms (Kawachi & Berkman, 2000; Sampson et al., 1997). Thus, it is plausible that enhanced community collective efficacy could actually increase disease-promoting behaviors if the behavioral norms of communities promote those behaviors. However, this systematic review identified only a handful of studies that measured behavioral norms, other than modeling. This shows a gap in knowledge of both normative community contexts and the seemingly multiple pathways between norms and health.

Another potential reason for the apparently weak associations between social capital concepts and health behaviors is measurement error. Others have discussed measurement

limitations of neighborhood-level latent constructs (Diez Roux, 2004; Harpham, Grant, & Thomas, 2002; Raudenbush & Sampson, 1999). This review found that the concepts of trustworthiness, neighborly reciprocity, and modeling relied on only one or two questions, which likely induces measurement error and bias. Also, some instruments for sense of community distinguished an effect, whereas other instruments did not. Furthermore, all but one study relied on self-reported behavior as a measure of behavioral norms (Hoehner, Brennan Ramirez, Elliott, Handy, & Brownson, 2005), but objective measurement methods are generally preferable.

Overall, these results suggest that a major limitation of existing literature is the lack of theoretical grounding. For example, studies have ignored theoretically potentially confounding factors, such as community social network characteristics, or individual's integration into community networks, which may explain null findings. Also, weak and inconsistent empirical findings may be due to mediating effects of behavioral norms, as suggested by the conceptual model presented here. In addition, these results are all observational. Little intervention research addresses community social capital and no studies have tested social capital theories or theoretically plausible pathways between social capital and behaviors. Testing of conceptual models, such as the one presented here, is needed.

Although random sampling strategies and diverse samples improves generalizability of these results, limitations of design and methods also exist in reviewed studies. The majority of studies were conducted in the United States, and findings may differ in other countries depending on political, socioeconomic, historical, or cultural factors. Also, many studies excluded participants who recently moved. Although this may reduce measurement error, it increases susceptibility to selection bias, especially since individuals of lower socioeconomic status, who tend to have housing instability, likely have different experiences with their neighborhood than wealthier, stable individuals. In addition, the preponderance of cross-sectional data limits causal conclusions. Also, many of the reviewed studies did not account for community-level clustering, limiting understanding of community-level influence of social capital, collective efficacy, and behavioral norms.

These limitations and inconsistent results found in this review highlight the need for iterative theory development. Empirical results and theory from social sciences should inform behavioral theories. Likewise, observational and intervention research should be theoretically based. The conceptual framework in this article is a novel approach to integrating social capital concepts into behavioral theory, but it requires validation. It provides a testable framework, based on theoretically plausible associations, and is supported by the limited empirical evidence available to date. Also, the framework is not presumed to be unique. Other behavioral theories, such as social cognitive theory, could

be extended to include community social concepts, such as social capital.

In addition, despite recent calls from the Institute of Medicine for multilevel interventions (Institute of Medicine, 2000), relatively few interventions thus far have targeted social and contextual environmental factors at city, neighborhood, or group levels (Golden & Earp, 2012). Such interventions may target modification of the social variable (e.g., see the Enhancing Recovery in Coronary Heart Disease trial; Carney et al., 2004). Although randomized studies are lacking, evidence suggests that social capital and collective efficacy can be increased via community and economic development (Brune & Bossert, 2009; Michael, Farquhar, Wiggins, & Green, 2008) or by improving neighborhoods' aesthetic appeal and other physical characteristics (Cohen, Inagami, & Finch, 2008). In addition, interventions should use social variables as a focal point for tailored interventions (Kreuter & Wray, 2003; Rakowski, 1999). These results add to a growing body of research that can inform theoretically based community behavioral interventions and health promotion programs to affect population health.

In summary, this review found that social capital concepts are associated with both health-promoting and disease-promoting behaviors in community settings. Based on data and theory, we propose a conceptual framework for integrating these concepts into existing behavioral theory. Both these results and the conceptual framework can inform development of socially tailored interventions to improve population health in this evolving area of science.

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### Supplemental Material

The online appendix is available at [heb.sagepub.com/supplemental](http://heb.sagepub.com/supplemental).

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