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EXTENSION CENTER FOR COMMUNITY VITALITY

Developing and Validating University of Minnesota Extension's Social Capital Model and Survey

Also see Methodological Appendix: Steps Before Confirmatory Factor Analysis

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INTRODUCTION

Social capital, defined as the web of cooperative relationships among members of a community that allows them to act collectively and solve problems together (Flora, C. B., Flora, J., & Fey, S., 2004; Putnam, 2000;Woolcock & Narayan, 2000), holds enormous potential as a lay-friendly tool to engage rural communities in understanding and strengthening their social fabric. During periods of intense economic and demographic change, efforts to understand, measure and strengthen social capital can provide generalizable analytical tools (Noy, 2008) that communities can use to more effectively understand their world and take strategic action to improve circumstances.

Because of growing interest in "real-world" applications of the social capital concept, it is important to develop valid and reliable measurement practices that are applicable across communities. After an extensive review of existing social capital survey tools, the authors concluded that existing surveys, while academically sound, were not grounded in a lay-friendly conceptual framework that could be used to educate about, as well as assess, the social capital in a community. During 2007 and 2008, we created a conceptual framework and piloted a social capital assessment in four Minnesota communities, receiving more than 1,200 adult responses (Allen, Chazdon, Radke, & Spanier, 2012).

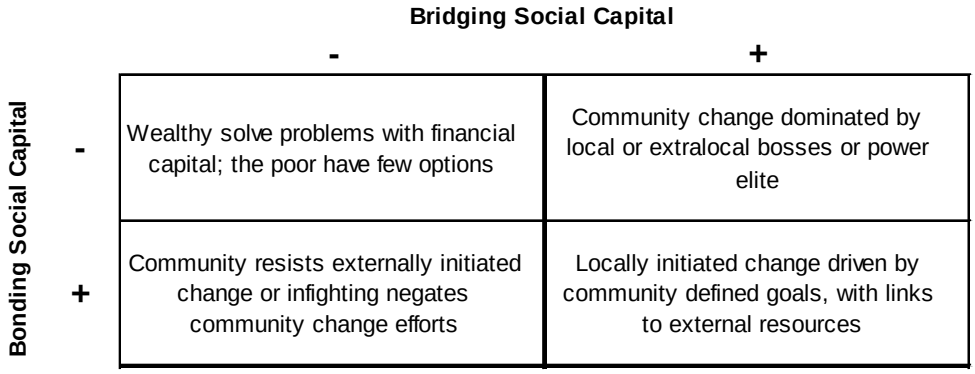
This report provides background on the development and validation (through the pilot) of our conceptual framework to measure social capital in rural communities. We review the literature that informed the design of the framework and describe the methods used to conduct a confirmatory factor analysis of the model. Our result suggests that the social capital assessment employed in this study is a valid instrument based on an overarching conceptual framework for understanding and building social capital in communities of place.

LITERATURE REVIEW

The research literature on social capital has organized around two themes – one that emphasizes the benefits of social capital for individuals and one that emphasizes its group benefits. One perspective argued by Lin (2001) states that social resources and connections are even more important for individuals than personal resources, such as education or wealth. Burt (1992) similarly argues that positions within social networks create competitive advantages for people. Another perspective is argued by Putnam (1993) and Bourdieu (1986) who emphasize that social capital is a collective asset produced and shared by members of a group.

Bonding and Bridging Networks

Building on earlier work like Putnam's and Bourdieu's, Flora and others applied the idea of social capital to rural community contexts, creating the typology (Figure 1) that links two aspects of social capital — bonding and bridging networks — to effective community action (Flora et al., 2004).



Adapted from Flora, C. B., Flora, J. L., & Fey, S. (2004). *Rural communities: Legacy and change* (2nd ed.). Thousand Oaks, CA: Sage Publications.

FIG. 1: Community Social Capital Typology and Change

Bonding networks refer to strong connections among individuals and groups with similar backgrounds (Briggs, 1998; Wellman, 1979). These connections are typically with family, friends, and neighbors. **Bridging** networks refer to weak social ties that can help people get ahead and gain opportunities (Briggs, 1998; Gittell & Vidal, 1998).

Examples of weak ties include people from different backgrounds who are engaged in different types of networks (Granovetter, 1973). Flora and others (2004) argue that communities with high levels of both bonding and bridging networks are the most able to engage in effective community action, a quality they define as an "entrepreneurial social infrastructure."

Communities with entrepreneurial social infrastructures are marked by three characteristics, including:

- A sense that community members can disagree and still maintain mutual respect;
- The existence of diverse, yet inclusive and flexible networks that effectively engage newcomers; and
- High levels of individual and collective investment in the common good of the community (Flora et al., 2004; Flora & Flora, 1993; Flora, Sharp, Flora & Newlon, 1997).

When there is an imbalance in the strength of bonding and bridging networks, communities experience a variety of problems. Communities with weak bonding and bridging networks suffer from extreme individualism and find it difficult to engage in any sort of collective action. As a result, wealthy or powerful individuals often end up controlling the process of change in the community (Flora, Flora, & Fey, 2004).

Furthermore, communities with strong bonding but weak bridging networks tend to experience conflict among separate insider groups vying for control of decision-making, while communities with strong bridging but weak bonding networks tend to leave too much control in the hands of outsiders or wealthy and powerful insiders.

Linking Networks

Other scholars have developed the idea of **linking** networks as they relate to social capital. Based on the work of Szreter and Woolcock (2004), linking networks are defined as "networks and institutionalized relationships among unequal agents" (Szreter, 2002, p. 579). Compared to bridging networks, which connect individuals who are not alike yet are more or less equal in terms of status or power, linking networks are based an explicit "vertical" power differentials.

Particularly in poor communities, "it is the nature and extent (or lack) of respectful and trusting ties to representatives of formal institutions, e.g., bankers, law enforcement officers, social workers, and health care providers, that has a major bearing on their welfare" (Szreter & Woolcock, 2004, p. 655). These vertical connections to organizations and systems help residents access resources and bring about change.

Linking networks are considered strong when residents trust leaders of public and private institutions and are able to engage with those leaders. Thus, the addition of linking social capital (Szreter, 2002; Szreter & Woolcock, 2004), adds a more vertical dimension of power and access to resources to the social capital picture.

CONCEPTUAL FRAMEWORK

A key objective of our research was to determine whether a conceptual model based on these three distinct types of social capital accurately portrays social capital in rural communities. Therefore, we created a social capital assessment instrument that measures bonding, bridging and linking social capital.

To measure each type of social capital, we followed the lead of many scholars who have studied social capital at the individual level. As argued by Brehn and Rahn (1997, pp. 1002-03), for example, "it is not, after all, a 'community' that participates in or builds trust, but the people who comprise that community who belong to civic organizations and acquire positive feelings towards others." Therefore, within each type of social capital we focused on behavioral and cognitive traits of individuals.[1] By behavioral traits, we mean various types of exchange, contact with people different from oneself, and participation in civic life. By cognitive traits, we mean individual perceptions of trust, mutual support, and the ability to participate in civic life.

In developing our conceptual model, we measured different forms of trust because of the centrality of trust themes in the social capital literature. These are trust of people in one's immediate social circle in the case of bonding social capital; trust of people from social backgrounds different from oneself for bridging social capital; and trust of community leaders and institutions for linking social capital.

Three Types – and Efficacy

The combination of the behavioral and cognitive aspects of the three types of social capital yields a conceptual framework that includes six domains of social capital. In pairs, they are: bonding trust and bonding engagement, bridging trust and bridging engagement, and linking trust and linking engagement. We also added a seventh domain that is integral to the whole social capital picture: **efficacy.**

We debated whether to employ the label of agency or efficacy to describe the ability to make a difference in one's community. The concept of community agency has been recently defined as "the capacity of people to manage, utilize, and enhance those resources available to them in addressing local issues" (Brennan & Luloff, 2007, p. 53).

However, practitioners engaged in the work expressed concern that using the term "agency" tended to confuse community members who would conflate the conceptual use of the term with the

[1]De Silva, Harpham, Tuan, Bartolini, Penny, and Huttly, (2006) label these as structural and cognitive components, while Stone (2001) distinguishes structural aspects of social capital pertaining to networks from quality aspects pertaining to norms of trust and reciprocity.

practical meaning of an organization, such as a social service agency. Therefore, because our model is primarily intended as a tool for communicating with lay audiences, we chose the efficacy label.

Bandura (1977, p. 3) originally defined the concept of *self*-efficacy as perceptions or "beliefs in one's capacity to organize and execute the courses of action required to produce given attainments." He went on to define *collective* efficacy as a "group's shared belief in conjoint capabilities to organize and execute the course of action required to produce given levels of attainments" (Bandura, 1997, p. 477).

Our individual-level measurement of efficacy lacks the shared aspect in these definitions of collective efficacy, so we chose to simply use the term "efficacy" to describe our aggregation of individual-level data emphasizing the ability to make a difference in social contexts.

As argued by Cox (2007, p. 509), social capital should be seen as a "portmanteau" concept, or a collection of overlapping and maybe contradictory measures of social connectivity that work as analytic tools offering interesting insights into the complexities of social systems. Thus, inherent to our approach is a notion of social capital as an overarching construct that encompasses a range of related sub-constructs.

METHODOLOGY

To measure social capital, some studies have relied upon secondary data sources, such as the Panel Study of Income Dynamics (Hofferth & Iceland, 1998) or the General Social Survey (Kawachi, Kenney, & Glass, 1999), to generate proxy measures for social capital. For example, Hofferth and Iceland focused on particular survey items measuring exchanges of time and money between families in the study sample with both kin and non-kin. Kawachi and colleagues focused on questions in the General Social Survey measuring the extent of civic trust.

Beyond tools relying on large-scale secondary data sources, researchers have developed a range of other survey tools for measuring social capital. Perhaps most notable among these in the United States is the Harvard/Saguaro Seminar Social Capital Community Benchmark survey (Saguaro Seminar, 2000). The Saguaro survey employs a random telephone survey methodology and tends to focus on large metropolitan regions, states or countries. Thus, this survey and others like it are largely unproven in rural U.S. contexts.

Other researchers have focused more explicitly on measuring social capital in rural communities. For example, Liu and Besser (2003) conducted a social capital survey in 99 small Iowa communities. Their survey employed four scales to measure social capital in the local community: informal ties, formal ties, generalized trust, and norms or expectations of collective action. Our approach to measurement bore some similarity to Liu's and Besser's approach in that we also created a comprehensive conceptual framework; however, our framework featured seven distinct measurement scales and the three distinct types of networks comprising social capital.

Participatory, Community-Based Approach

Because our interest in social capital was primarily linked to Extension work in rural communities, we wanted to take a participatory, community-based approach to survey implementation, i.e., to place the responsibility for sampling and collecting data in the hands of community residents. Because no exact model for this type of survey or assessment process in rural U.S. communities could be found, we designed a survey tool and assessment process based on our own existing instruments and experience working in rural communities.

Three of the four communities selected for the assessment were decidedly "rural" and were located well outside major metropolitan areas, while one community was located relatively close to a major

metro area. These communities volunteered to participate in the assessment process and – based on their experience with each community – Extension educators judged that they possessed sufficient volunteer capacity to successfully conduct the survey.

In each community, an Extension educator organized a project team of volunteers to conduct the survey. Each project team was charged with development of a non-random convenience sampling plan designed to reach subpopulations normally not queried in a community survey. The planning team and volunteers mapped out places to survey a representative cross section of the community; these places included civic and community organizations, private businesses, schools, food shelves, churches, community service agencies, libraries, and coffee shops.

Surveys were administered using a hand-out method in which the volunteer asked individuals to complete the survey and put it in an unmarked envelope to assure confidentiality in processing. One community offered both a paper survey and an online survey option, which was promoted through the local Internet service provider and media. While not optimal, this mixed-mode approach was a practical necessity because a substantial number of community members were snowbirds who did not reside in the community during winter months when the survey was conducted.

Surveys Administered in Four Communities

A total of 1,293 adults completed surveys in the four communities. Sample sizes in each community varied from 168 to 465 adult residents. Compared to the populations in each community, the samples were disproportionately female, well educated and wealthy. This is not surprising, given the convenience sampling approach.

However, for purposes of measuring the *internal consistency* of the conceptual framework, the large sample size was more important than the representativeness of the sample. As noted by DeVellis (2003, p. 89), a sample that is *quantitatively* non-representative, while not optimal, can still be used for scale development efforts. The more dangerous type of non-representativeness for scale development occurs when the sampled participants are *qualitatively* different than the target population in terms of the meanings the sampled participants ascribe to the survey items. In the case of the four communities in this study, this type of non-representativeness was unlikely.

VALIDATION RESULTS

To validate conceptual domains and the overall conceptual model, we used both exploratory and confirmatory factor analysis techniques. (The exploratory phase is described in the Methodological Appendix.) We employed confirmatory factor analysis (CFA) to test the seven-factor model and make further modifications to enhance the overall model fit. Once we achieved the best fit, we determined the reliability of the seven survey scales using Cronbach's alpha, a measure commonly used to gauge the reliability of a psychometric instrument.

To confirm our factor structure, we created a structural equation model using IBM SPSS Amos17.0 software. Structural equation models test expected relationships between a set of variables and the latent factors upon which they are expected to load (Byrne, 2010; Kline, 1998). Our approach to using confirmatory factor analysis followed the "model-generating" use of CFA described by Joreskog (1993). In the model-generating use of CFA, the researcher begins with a tentative model, runs the analysis, and then modifies the model, based on theory as well as statistical output, to get the best fit and most efficient model possible (Byrne, 2010; Joreskog, 1993; Kline, 2005).

Following Joreskog (1993), we first created and ran separate measurement models for each of the seven constructs. Measurement models represent only the relationship between a single construct and the survey items intended to measure the construct.

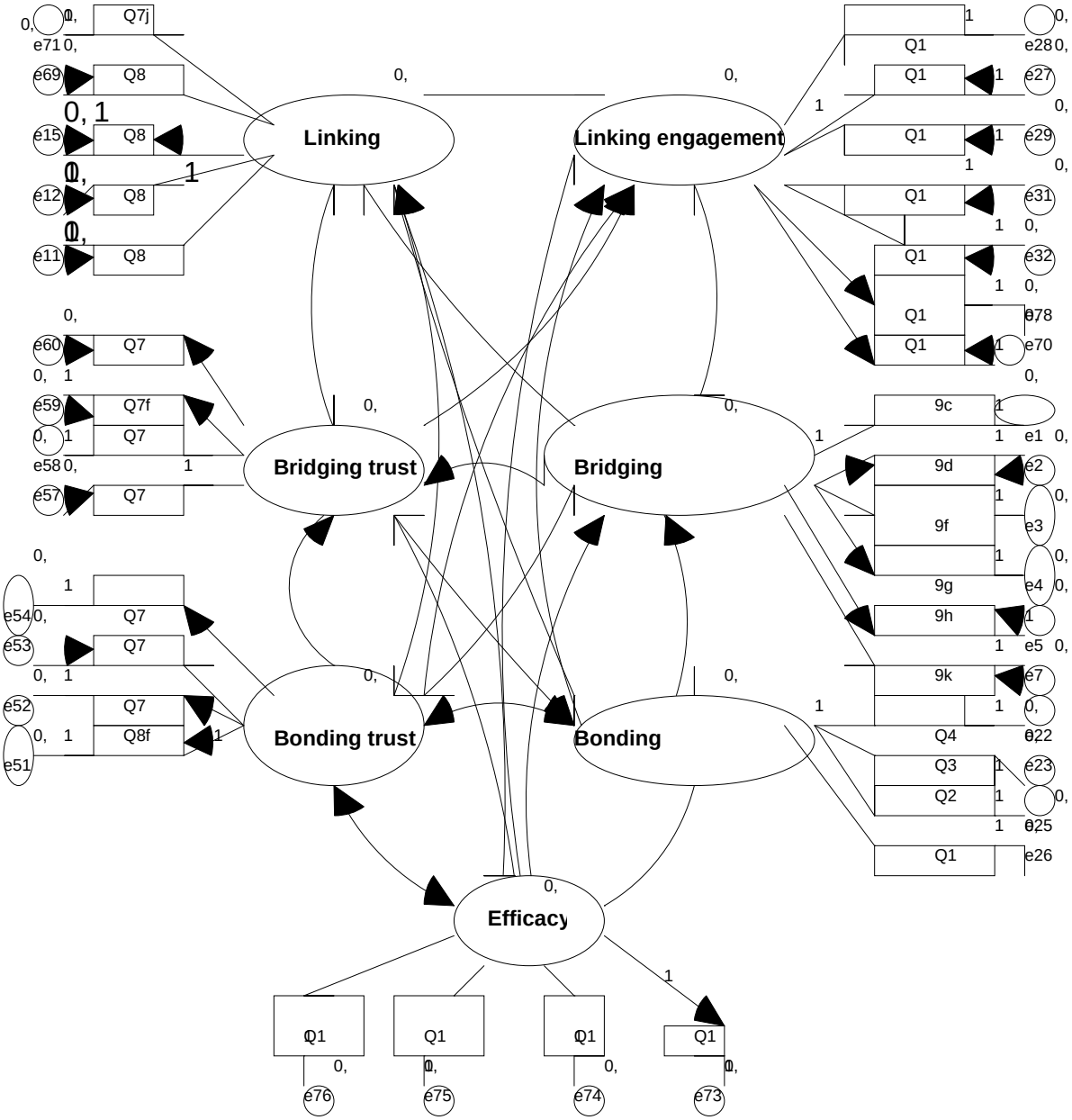


FIG. 2: Structural Equation Model

The structural equation model, depicted in Figure 2, contains 34 items used to measure the seven constructs. The goodness-of-fit statistics for the model, as seen in Table 2, met the standard for optimal fit in two of the four measures (the chi-squared to degrees of freedom and the Root Mean Square Error of Approximation), and was much closer to an optimal fit based on the Tucker-Lewis Coefficient and the Comparative Fit Index. We concluded that the model fit was strong.

	X^2 / df	Tucker-Lewis Coefficient (TLI)	Comparative Fit Index (CFI)	Root Mean Square Error of Approximation (RMSEA)
Optimal value	<3 [a]	>.95 [b]	>.95 [c]	<.05 [d]
Initial Model	3.64	.809	.820	.055
Final Model	2.61	.901	.915	.043

a Bollen, 1989
b Hu & Bentler, 1999
c Bentler, 1990
d Brown & Cudeck, 1993

TABLE 1: Model Goodness-of-Fit Measures

We then reviewed the output on correlations among the seven constructs of the model to determine if the correlations made theoretical sense. This is known as convergent validity. In assessing the convergent validity of the seven survey scales, we used guidelines developed by Cohen (1988). According to Cohen (1988), correlations in the 0.1 to 0.3 range are considered weak, but if they are statistically significant, they are often sufficient.

Cohen also reports that correlations in the 0.3 to 0.5 range can be considered moderate, while correlations above 0.5 can be considered strong. We expected to find moderate to strong correlations among the different types of trust (bonding, bridging and linking), but we were uncertain about the degree of correlation among the different types of engagement. We also anticipated that efficacy would be moderately or strongly correlated with linking engagement.

As seen in Figure 3, all correlations among the constructs were statistically significant, and all but one correlation was significant at less than the $p < 0.001$ level. The strongest correlations (correlations of 0.5 or higher) were among the three trust scales. An additional strong correlation was found between bonding trust and bonding engagement.

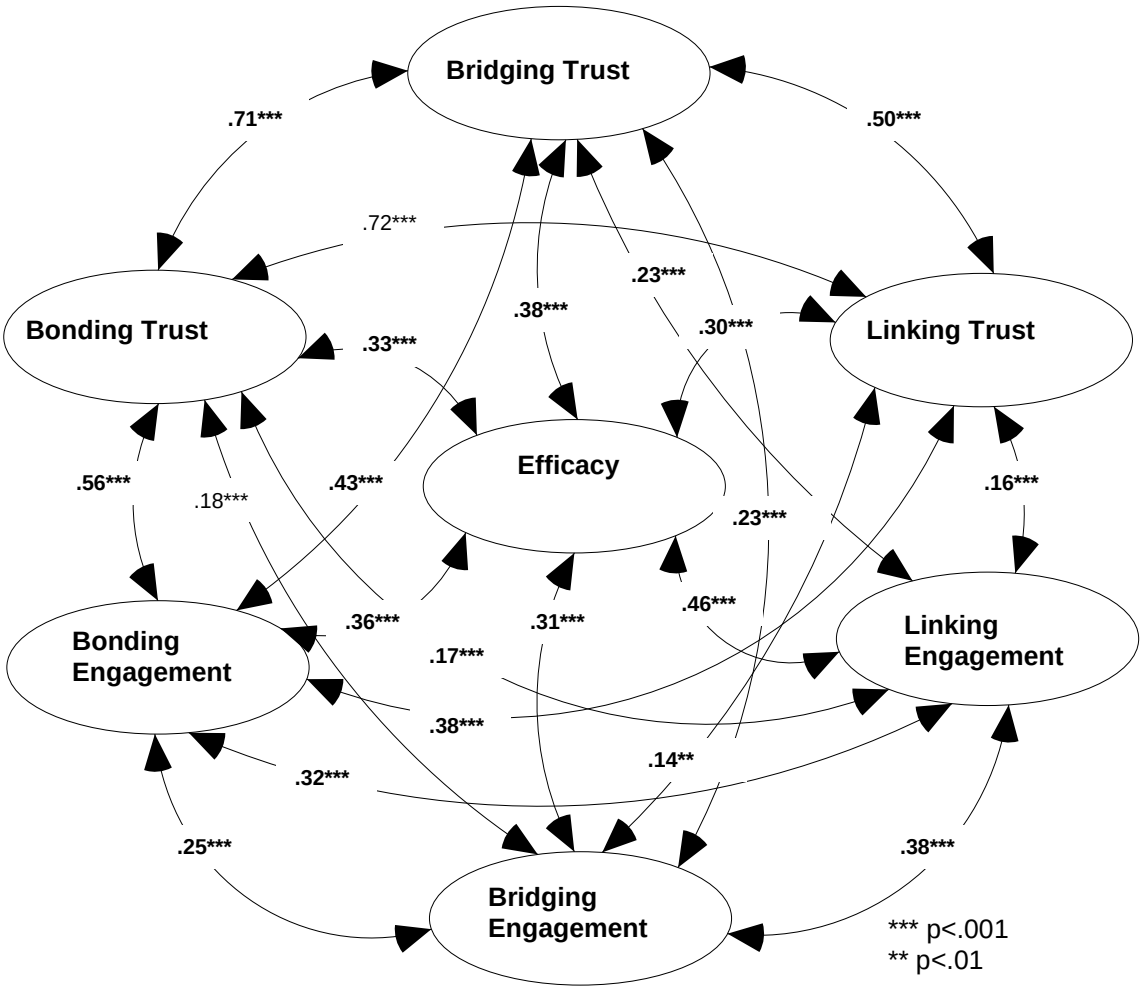


FIG. 3: Correlations Among the Scales

Most of the correlations were of moderate strength (between 0.3 and 0.5). The efficacy concept had moderate correlations with all of the remaining constructs. For this reason, we located the efficacy construct in a central location in this diagram and argue that this perceived "ability to make a difference" is a central, animating aspect of social capital.

The weakest correlations (0.1 to 0.3) occurred between bonding trust and bridging engagement, bonding trust and linking engagement, bonding engagement and bridging engagement, bridging trust and bridging engagement, bridging trust and linking engagement, linking trust and bridging engagement, and linking trust and linking engagement. These weaker, though statistically significant, results suggest that different types of engagement (bonding, bridging and linking) are weakly related to each other. The correlations also suggest that individuals can report trust in people who are different from themselves even though they do not have much contact with them. Individuals also can report trust in local institutions, but that does not mean they are engaged with them.

Upon completion of the CFA model, we calculated Cronbach's alpha, a test of internal reliability, for each scale. The reliability coefficients are presented in Table 3 below. Reliability coefficients for all

seven scales were high, with all but one above 0.7. The weakest scale was bonding trust. To strengthen this scale, future versions of the survey will include items related to trust of friends and family members.

Item #	Survey item	Scale	Cronbach's alpha
7a	Trust neighbors	Bonding trust	0.669
7b	Trust co-workers		
7c	Trust people at church		
8f	Trust faith-based organizations in your community		
1	Can count on someone in the community if you need some extra help	Bonding engagement	0.764
2	You and people in your community do favors for each other		
3	You would ask your neighbors for help if you were sick		
4	Community members would get together to help a neighbor with a serious need		
7c	Trust people from other cultural or ethnic groups	Bridging trust	0.808
7d	Trust people of other religious beliefs		
7e	Trust people new to the community		
7f	Trust people in the same clubs or activities as you		
9c	Level of contact with people who have a different religion than me	Bridging engagement	0.800
9d	Level of contact with people of a different race or ethnicity than me		
9e	Level of contact with people much poorer than me		
9g	Level of contact with people who have a different sexual orientation than me		
9h	Level of contact with people who have less education than me		
9k	Level of contact with people who have different political views than me		
8a	Trust local government	Linking trust	0.786
8c	Trust educational organizations in your community		
8d	Trust health care organizations in your community		
8e	Trust social service organizations in your community		
7j	Trust people in law enforcement		
11a	Number of times you attended any public meeting	Linking engagement	0.788
11b	Number of times you attended a political meeting or rally		
11c	Number of times you attended any club or organization meeting		
11g	Number of times you have been in the home of a community leader		
11h	Number of times you have joined together with others in your community to address an issue		
11k	Number of times you tried to get your local government to pay attention to something that concerned you		
11l	Number of times you organized a community effort		
10b	Believe you can make a difference strengthening social clubs or groups	Efficacy	0.835
10c	Believe you can make a difference helping newcomers get involved		
10d	Believe you can make a difference connecting your organization(s) with other groups		
10e	Believe you can make a difference helping community institutions be more responsive		

TABLE 2: Social Capital Scale Items and Reliability Coefficients

CONCLUSION

Using confirmatory factor analysis, we determined that the seven conceptual domains – bonding trust, bonding engagement, bridging trust, bridging engagement, linking trust, linking engagement, and efficacy – are valid and reliable as measurement scales and that the overall model held together as a conceptual framework for measuring social capital.

Our educational model reflecting seven domains of social capital is shown in Figure 4. Efficacy is at the center of the model, reflecting its importance as the energy needed to animate community social capital. The outer rings represent trust and engagement in the three distinct types of social networks: bonding networks among residents with a common social background, bridging networks among residents from different social backgrounds, and linking networks between residents and organizations and systems.

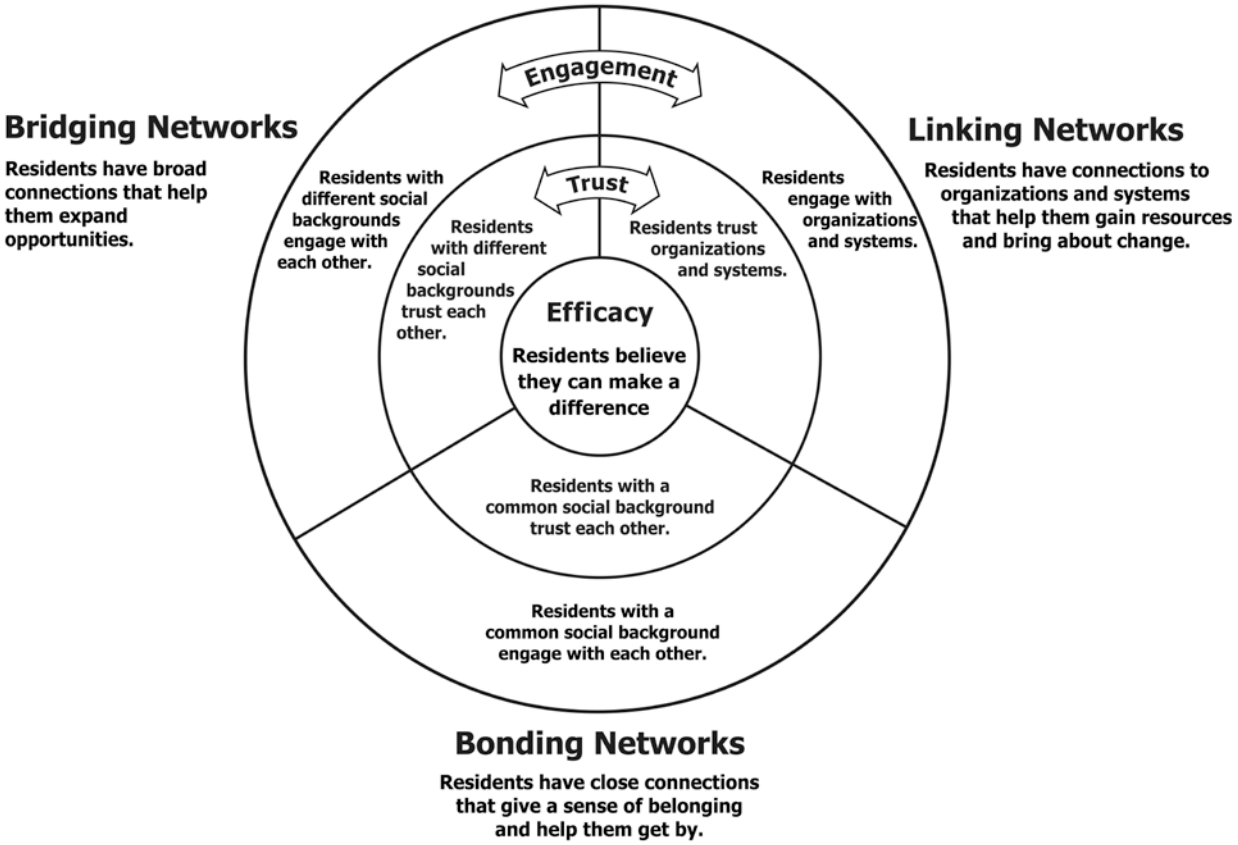


FIG. 4: Educational Model

Despite some limitations, our work constitutes a valid and valuable contribution to the research on social capital. The seven-domain model provides a user-friendly resource for education about social capital, and the assessment tool makes it possible to give communities feedback on specific aspects of their bonding, bridging, and linking networks – as well as collective efficacy.

Social capital has been called the "glue that holds communities together." The constructs of our model, as well as our survey instrument, provide the tools to reinforce that glue – and ensure a better future for our communities.

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