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The Development and Testing of an Instrument to Measure Youth Social Capital in the Domain of Postsecondary Transitions

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Abstract

Through the development and field testing of an instrument designed to measure youth social capital in the context of postsecondary transitions, this research addresses the need for theory-driven measures of social capital among youth. The results offer preliminary evidence that dimensions of youth social capital, including network structure and network content, can be reliably measured and that these dimensions of social capital are interrelated in a manner consistent with theory. The results also offer initial support for the validity of the social capital construct within the domain of youth postsecondary transitions. Taken together, the findings provide a foundation for continued research that might surmount inadequate measures and theoretical disputes to encompass more careful and rigorous empirical scrutiny when it comes to the measurement of social capital among children and adolescents.

Keywords

emerging adulthood/adult transition, measurement development, quantitative methods, social capital, structural equation modeling

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The role of social relationships in child and adolescent development has long captured the attention of researchers from a range of disciplines (Lee, 2014). It was arguably Coleman's (1988) foundational research, however, that launched social capital theory into the educational research mainstream, and the concept of social capital has since become a mainstay in scholarship addressing a host of youth outcomes (Lee, 2014). Findings from the most robust meta-analysis to date on the role of social capital among youth (Dika & Singh, 2002) suggest that social capital shares a positive association with educational attainment, academic achievement, and social-psychological factors including engagement and educational aspirations.

Social capital theory posits that individuals gain access to valued information, advice, and assistance via personal relationships (Bourdieu, 1986; Coleman, 1988; Lin, 2001; Portes, 1998), making it an especially popular framework through which to explain how youth access (or not) resources critical for successfully navigating postsecondary transitions (for recent summaries, see Almeida, 2015; Stephan, 2013). The knowledge and resources required to develop and execute postsecondary plans must be learned and acquired (Stephan, 2013), often via relationships with family members, school staff, friends, and others (Almeida, 2015). For instance, college information, assistance with preparation and enrollment, high expectations, and social norms have all been described as resources available through students' networks that influence postsecondary transitions (Perna, 2000; Stephan, 2013).

Although all youth have social capital (Lareau & Horvat, 1999), applications of social capital theory in postsecondary research typically posit that variability in the structure and content of youth's social capital contributes to individual-level variation in outcomes related to postsecondary preparation and enrollment (Perna, 2000; Stephan, 2013). Currently, however, there is a lack of clarity regarding the concept of social capital and its measurement among children and adolescents. As a result, application of the social capital concept to youth and their postsecondary endeavors remains limited. Addressing these limitations, the research reported here included the field testing of a survey designed to measure youth social capital in the domain of postsecondary transitions.

The Concept of Social Capital and Problems With Its Measurement Among Youth

Access to resources through one's relationships lies at the core of definitions articulated by most prominent scholars of social capital (Bourdieu, 1986; Coleman, 1988; Lin, 2001; Portes, 1998). Yet, debates persist over the

constituent elements and the value of social capital in different domains, over whether social capital is a property of individuals or groups, and over whether it is an entity or a process (Fulkerson & Thompson, 2008). In part because social capital theory draws on not one but on multiple sociological traditions (Portes & Sensenbrenner, 1993), the social capital debate has divided into two competing camps (Fulkerson & Thompson, 2008; see Collins, 1994, for a review of the four primary sociological traditions).

In one camp are normative social capitalists (Fulkerson & Thompson, 2008) who view social capital as those features of social structure—particularly norms of trust and reciprocity, as well as cohesion and solidarity (Fulkerson & Thompson, 2008)—that give rise to collective action intended to provide shared benefits for the group (Coleman, 1988, 1990). This perspective on social capital is perhaps best exemplified in the work of Robert Putnam (1995) and James Coleman (1988). A normative perspective views social capital as a property of groups (e.g., schools, neighborhoods, and nations) and emphasizes how social norms, rules, and trust result in collective assets for group members.

In contrast, resource social capitalists (Fulkerson & Thompson, 2008) view social capital as a property of individuals, and they typically ground their work in Bourdieu's (1986) definition of social capital as comprising both the social relationship that allows access to resources and the quantity and quality of those resources (Portes, 1998). Resource social capitalists see social capital as helping to explain inequalities in the accumulation of tangible (e.g., educational attainment, wealth) and intangible (e.g., power, prestige) resources. Moreover, they view intangible resources as especially critical to the capacity of social capital to function as a hidden form of capital (Bourdieu, 1986), and thus a mechanism of stratification (Ream, 2005; Stanton-Salazar, 2001). This camp is more likely than normative social capitalists to acknowledge the influence of context on access to and activation of social capital.

Ultimately, differences between the normative and resource perspectives have generated not only conceptual confusion but also measurement challenges in research on social capital among youth. One problem is inadequacy in the conceptualization of social capital (Condon, Engle, Lavery, & Shewakramani, 2010; Dika & Singh, 2002). A normative perspective on social capital typically locates social capital at the collective level (e.g., community, nation), while a resource perspective most often locates social capital at the level of individuals within a network. Viewing social capital as a property of groups rather than individuals simultaneously positions social capital as a cause and an effect, whereby social capital produces positive group-level outcomes and its presence is assumed based on those same outcomes (Portes,

1998). This concern has generated support for the position that social capital becomes clearest when measured at the individual level (Lin, 2001; Portes, 1998; Van der Gaag, 2005).

A second problem in the measurement of social capital among youth is simply that there has been relatively little empirical research in this area. More often than not, young people have been viewed as passive recipients of social capital rather than as agents capable of activating the resource potential of their own networks (Harpham, 2002; Leonard, 2005). Furthermore, as Morrow (1999) observed, most commonly used measures among youth are indirect and, at best, rough approximations of social capital. Previous studies using indirect proxies are critical because they have called much-needed attention to the role of sociability for educational processes and outcomes (Ream, 2005). However, these proxies are often derived from datasets not intended to measure social capital and offer limited information about relational characteristics and access to resources via personal networks (Dika & Singh, 2002; Stanton-Salazar, 2001). For instance, applications of social capital theory in research on postsecondary transitions have relied predominantly on proxy measures from large secondary datasets reflecting the attributes of youth and their parents. This includes, for example, youth attributes such as the number of parents or siblings, the importance of grades to friends, friends' postsecondary plans, whether a parent volunteers at school, whether a parent knows friends' parents, and the frequency of discussions and activities with parents. Such variables are not unimportant, and have indeed demonstrated positive associations with postsecondary preparation and enrollment (e.g., see Carbonaro, 1998; Coleman, 1988; Dika & Singh, 2002; Klasik, 2012; Klevan, Weinberg, & Middleton, 2015; Perna & Titus, 2005; Ryan & Ream, 2016). Yet, these proxy measures are limited in their ability to fully reflect the concept of social capital given that they fail to chart "who is related to whom in what context" and thus where, how, and for what purpose social capital is generated (Lee, 2014).

A final concern related to the measurement of social capital among youth is a tendency to equate structural properties of networks with social capital. Recent advances in social network analysis have made it possible to study the structural properties of specific, bounded networks constituted by individuals or any set of relationally connected entities (Marin & Wellman, 2011). Although social network theory and social capital theory overlap, the structure of one's network in a particular domain (e.g., school, work) is not synonymous with one's social capital. The measurement of social capital must recognize the related but distinct dimensions of network structure and content (Djikstra & Peschar, 2003; Gamoran, Turley, Turner, & Fish, 2012). The structure of social capital refers to the pattern of social relationships, including the location

of individuals within a network as well as the collective assets (e.g., norms, trust) that characterize the network (Lin, 2001). The content of social capital refers to the resources deployed through the social network. Analyzing network structure as though devoid of content paints an incomplete picture of an individual's social capital, as does focusing on content without considering the generating structure of relations.

The Current Study

In this study, we set out to measure the multidimensional concept of social capital among youth in the domain of postsecondary transitions. Building from Lin (2001), we do so by integrating normative and resource perspectives on social capital. Lin (2001) broke social capital into three constituent elements intersecting network structure, network content (access to resources), and action (mobilization of resources).

Informed by the normative perspective on social capital, we examine three aspects of network structure. The first is network location (Lin, 2001), as indicated by closeness, trust, and network density. Networks in which most people know one another (dense networks) and which are characterized by close and trustworthy relationships may be more likely to facilitate access to at least some kinds of resources (Coleman, 1988). The other two aspects of network structure we consider reflect collective network assets (Lin, 2001) and include network norms and belongingness (Harpham, 2002; Morrow, 1999). Networks that are characterized by a sense of belonging and pro-academic norms may support successful college transitions. We examine network content by considering student access to resources specific to the domain of college preparation and enrollment. Finally, we consider action, or mobilization of network resources, by exploring relationships between network structure and content, on one hand, and outcomes associated with successful postsecondary transitions, on the other hand. Specifically, using data collected through administration of the instrument developed as part of this research, we address the following research questions:

Research Question 1: Can dimensions of youth social capital reflecting network structure and content be reliably measured?

Research Question 2: To the extent that dimensions of youth social capital can be reliably measured, how are they associated with one another?

Research Question 3: To what extent does the proposed measure of youth social capital offer evidence of construct validity?

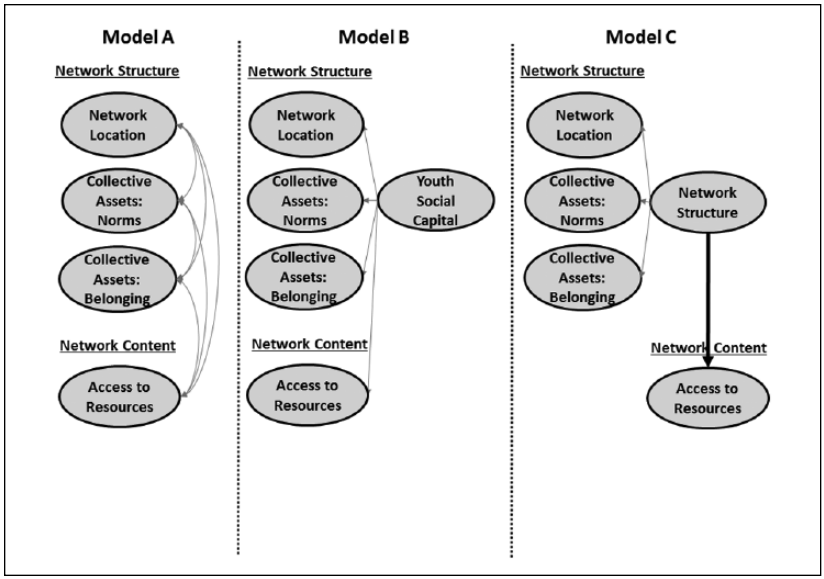

Figure 1. Illustration of the three latent factor models under investigation, including a correlated traits model (Model A) and the two conceptualizations of the second-order factor model (Models B and C).

Note. Ellipses depict latent factors. Gray lines indicate the relationship between two latent factors or between a second-order latent factor and its first-order latent factor indicators. The bold black line indicates the hypothesized influence of one latent factor on another latent factor.

We investigate these questions using confirmatory factor analysis (CFA), which can show whether the observed variables hypothesized to measure an unobserved construct demonstrate a level of shared variance high enough to suggest that those items represent a common underlying factor. We begin with a correlated traits model (Model A; see Figure 1) in which the overarching construct of interest, youth social capital, is separated into its component dimensions. In this model, network structure is represented by network location and by collective assets including peer norms and sense of belonging, while network content is represented by access to resources. In the correlated traits model, the constituent dimensions are considered to be related to varying degrees but no attempt is made to measure a single common social capital construct.

We also examine a second-order factor model, conceptualized in two ways. The first conceptualization (Model B; see Figure 1) considers youth social capital as a substantive quantity that explains the correlations

among dimensions of network structure and content. The second conceptualization (Model C; see Figure 1), which is most consistent with Lin's network theory of social capital, views youth social capital as a process in which network structure, a second-order factor underlying network location and collective assets, facilitates or impedes access to resources.

Method

Participants

The data for this study were collected in the spring of 2014 from 140 students in Grades 9 (34% of the sample), 11 (22%), and 12 (43%) in a mid-sized urban school district through administration of the Youth Social Capital and College Knowledge Survey. Sixty-one percent of the sample was female, 58% was from a non-Hispanic White racial/ethnic background, and 67% was eligible for free or reduced-price lunch. Across all items included in the instrument, responses were missing for ≤1% of cases. In addition to instrument data collected directly from student participants, institutional data about each participant were obtained from district records.

Procedure

To establish both face (i.e., items reflect the construct being measured) and content (i.e., all concepts within the construct are covered) validity, the preliminary set of items was reviewed by four university faculty at three institutions who have expertise in the collection of social network data, social capital theory, and postsecondary transitions. The item set was then revised based on feedback before undergoing a second round of review by the same individuals. Next, cognitive interviews were conducted with nine students. Cognitive interviewing is a method for identifying and correcting problems with measurement instruments and involves administering the draft instrument to a respondent while concurrently interviewing him or her to determine whether the items are eliciting the information that the researcher intends (Beatty & Willis, 2007). The instrument was designed to be administered online to facilitate efficient administration and to reduce the likelihood of errors during data collection and analysis, and it was developed in the online open source survey platform LimeSurvey (https://www.limesurvey.org). The instrument was administered to participants near the end of the school year during a regularly scheduled class period. Participants required an average of 21 minutes to complete all instrument items.

Social Capital Measures

Two name generators (McAllister & Fischer, 1978) were used to gather information about the number and characteristics of participants' social ties. Name generators have been extensively used as a measure of social capital in research with adults, but seldom with youth (Appel et al., 2014). A name generator elicits a list of names (ties) from the participant, and researchers typically use a series of follow-up name interpreters to collect specific information about each of the participant's ties.

Study participants were first asked to list the initials or first names of up to five individuals with whom they had discussed, during the current school year, what they planned to do after high school. During cognitive interviews, we observed that students primarily listed parents or school-based ties in response to this name generator, yet named others when further prompted, including peers, extended family, and other acquaintances. Thus, in an attempt to better capture all ties with whom a student discusses future plans (plans ties), the second name generator asked participants to list the initials of up to five other individuals they considered important in their lives. The average network included 4.0 plans ties and 2.7 other important ties. Participants in Grade 12 named more plans ties (4.3) than participants in Grade 9 (3.6; $p = .01$). Based on responses to the two name generators, the participant's named ties were prepopulated into a subsequent series of name interpreter items, which prompted the participant to provide specific information about each named tie. One of these name interpreter items asked the participant to indicate how she or he was related to each named tie. Worth noting, there were no statistically significant differences across grade levels in the average share of participants' networks comprised by each of the following: immediate family members (sample average, 36%), extended family members (13%), friends (28%), school staff (15%), and others (8%). Participants also responded to name interpreter items intended to measure network location, network content, and mobilization of resources.

Network structure. Network structure, or structural embeddedness, is reflected in the location of individuals within a network and the collective assets of the network (Lin, 2001).

Network location. In this study, network location was measured through indicators of network closeness, network trust, and network density, which were combined to create a network location latent variable ($\alpha = .72$; see Table 1).

Collective assets. Collective assets were measured through items tapping peer norms (Coleman, 1988; Lin, 2001) and sense of belonging at school

Table 1. Descriptive Statistics for Outcomes and Youth Social Capital Indicators.

Indicator	*M* (*SD*)
Outcomes	
Cumulative high school GPA	3.00 (.73)
Proportion of school days in attendance	0.89 (.09)
Proportion with plans to complete a bachelors or above	0.72 (.45)
Network structure: Network location	
Proportion of ties considered close or very close	0.77 (.21)
Proportion of ties considered trustworthy	0.83 (.32)
Extent to which ties are connected to one another	0.52 (.24)
Network structure: Collective assets	
Positive peer norms[a]	
Number of friends who think it is important to get good grades	2.19 (.82)
Number of friends who are involved in a school club or sport	1.70 (.97)
Number of friends who attend school most days	2.14 (.83)
Number of friends who plan to attend college	2.27 (.80)
Sense of belonging[b]	
Extent to which student agrees she or he has good friends at school	4.00 (.91)
Extent to which student agrees she or he fits in at school	3.92 (.93)
Extent to which student agrees most of her or his teachers like her or him	4.01 (.89)
Extent to which student agrees other students at school like her or him	3.89 (.79)
Network content	
Percent of student's ties provided information/advice about 4-year college	0.49 (.34)
Percent of student's ties provided information/advice about paying for college	0.26 (.28)
Percent of student's ties provided information/advice about choosing a college	0.42 (.34)
Percent of student's ties provided information/advice about taking entrance exams	0.27 (.29)
Percent of student's ties provided information/advice about course taking in high school	0.24 (.30)
Percent of student's ties student believes expect him or her to complete 4-year degree	0.59 (.40)

Source. Youth Social Capital and College Knowledge Survey and district data (n = 140).
Note. GPA = grade point average.
[a]Response categories: 1 = none, 2 = a few, 3 = more than half, 4 = almost all.
[b]Response categories: 1 = strongly disagree, 2 = disagree, 3 = sort of agree but sort of disagree, 4 = agree, 5 = strongly agree.

(Harpham, 2002; Morrow, 1999). Given the importance of peers in the lives of adolescents as they prepare for postsecondary transitions (Almeida, 2015), participants were asked specifically about pro-academic norms among their friends (α = .81). Participants were also asked to respond to items addressing sense of belonging at school (α = .74; see Table 1).

Network content. Network content reflects the resources accessible through network ties. Participants were asked about access to various postsecondary resources through each of their named ties. For each resource, an indicator was created reflecting the proportion of ties through which the participant had access. The proportion of ties from whom the participant had access to each resource ranged from a low of 24% (courses to take in high school) to a high of 49% (enrolling in a 4-year college).

The expectations of network ties also constitute a resource for the individual, and another indicator was created to reflect the proportion of ties the participant believed expected him or her to complete a 4-year degree; the average participant perceived that 59% of his or her ties expected she or he would complete a 4-year degree. Ultimately, six indicators were combined to create the network content latent variable (α = .80; see Table 1).

Mobilization of resources. Participant responses on select instrument items, along with student-level data from the school district, provided information about postsecondary expectations and preparation. This included information about outcomes expected to be associated with access to social capital among youth, including, for example, high school attendance, grades, and postsecondary plans (see Table 1).

Analysis

We used CFA to examine the fit between each of the hypothesized models (see Figure 1) and the data. To assess the predictive validity of youth social capital, we used structural equation modeling (SEM) to combine measurement and structural components into a single model. This approach allowed us to simultaneously test associations among latent factors and each of the outcome variables. Analyses were conducted using Mplus statistical software, Version 7.0.

An advantage of CFA, and SEM generally, is that the analyses produce a number of fit statistics, making it possible to evaluate how well the hypothesized model fits the observed data. We examined fit indices including the chi-square statistic, the comparative fit index (CFI), and the root mean square error of approximation (RMSEA). The chi-square statistic is the traditional

method for evaluating overall model fit (Hu & Bentler, 1999), with good-fitting models ideally yielding an insignificant result ($p > .05$). However, small misspecifications in a model often lead to inflation of the chi-square statistic, even when the model is properly specified. Thus, we also relied on several conditional fit indices. Values of the CFI range from 0 to 1.0 and values of at least 0.90 are desirable to conclude an adequate fit between the model and the data (Hu & Bentler, 1999). The RMSEA indicates how well the model would fit the population covariance matrix given unknown but optimally chosen parameters; the suggested upper-limit cutoff is 0.06 (Hu & Bentler, 1999).

The robust weighted least squares (WLSMV, in Mplus) estimator was used to estimate the models described here. This estimator uses the probit link and provides standard errors and a chi-square test statistic that are robust to nonnormality. The WLSMV estimator is most appropriate in this research given that almost all observed variables used in this research, including the outcomes used to examine predictive validity, are categorical in nature. However, as a sensitivity check, we also ran all models using robust maximum likelihood estimation. The direction and statistical significance of all parameter estimates were consistent with those reported below.

In the past, several rules of thumb have been proposed for SEM sample size requirements, for example, a minimum sample size of 100 or 200 (Boomsma, 1982, 1985). Results from more recent simulation studies demonstrate the validity of SEM results with samples as small as 30 to 50 cases (Moshagen & Musch, 2014; Wolf, Harrington, Clark, & Miller, 2013), and support the use of SEM techniques with a sample of the size used in this research ($n = 140$). Nonetheless, as we note in our discussion of the findings, one direction for future research will be to replicate the analyses we describe here with a larger sample.

Results

Dimensional Structure

CFA. Results from the correlated traits CFA model (Model A; see Table 2) suggested adequate fit between the model and the data, $\chi^2(113) = 176.48$; CFI = .93; RMSEA = .06. All factor loadings were statistically significant at $p \leq .001$.

Next, we investigated a second-order CFA model, which assumes that correlations among first-order factors are explained in terms of an underlying second-order factor (Chen, West, & Sousa, 2006). Results from the second-order factor model in which the network structure and network content

Table 2. Model Descriptions, Including Standardized Factor Loadings or Regression Coefficients.

Latent factors (social capital dimensions) and item descriptions	Model A loading	Model B loading	Model C β
Network structure			
Network location			
Proportion of ties considered close or very close	.68	.60	
Proportion of ties considered trustworthy	.72	.80	
Extent to which ties are connected to one another	.42	.40	
Collective assets: Peer norms			
Number of friends who think it is important to get good grades	.90	.90	
Number of friends who are involved in a school club or sport	.62	.62	
Number of friends who attend school most days	.81	.81	
Number of friends who plan to attend college	.85	.85	
Collective assets: Sense of belonging at school			
Extent to which student agrees she or he has good friends at school	.60	.60	
Extent to which student agrees she or he fits in at school	.74	.74	
Extent to which student agrees most of his or her teachers like him or her	.71	.71	
Extent to which student agrees other students at school like him or her	.85	.85	
Network content			
Access to resources			
Percent of ties provided information/advice about 4-year college	.57	.58	
Percent of ties provided information/advice about paying for college	.66	.67	
Percent of ties provided information/advice about choosing a college	.80	.79	
Percent of ties provided information/advice about taking entrance exams	.72	.72	
Percent of ties provided information/advice about course taking in high school	.62	.62	
Percent of ties student believes expect him or her to complete 4-year degree	.39	.39	
Youth social capital (second-order factor)			
Network location		.39	
Peer norms		.72	
Sense of belonging at school		.83	
Access to college-related resources		.30	.30

(continued)

Table 2. (continued)

Latent factors (social capital dimensions) and item descriptions	Model A loading	Model B loading	Model C β
Model fit statistics			
χ^2 (*df*)	176.48 (113)	172.88 (115)	172.88 (115)
	p = .00	*p* = .00	*p* = .00
CFI	.93	.94	.94
RMSEA (90% CI)	.06 [.05, .08]	.06 [.04, .08]	.06 [.04, .08]
χ^2 difference		3.89(2)	
		p = .14	
R^2			.09

Source. Youth Social Capital and College Knowledge Survey and district data (*n* = 140).
Note. All factor loadings and regression coefficients significant at $p \leq .001$. CFI = comparative fit index; RMSEA = root mean square error of approximation; CI = confidence interval.

factors were specified as indicators of an underlying second-order social capital factor (Model B) also suggested adequate fit between the model and the data, $\chi^2(115) = 172.88$; CFI = .94; RMSEA = .06 (see Table 2). In the alternative conceptualization of the second-order factor model (Model C; see Table 2), network location and collective assets remained as first-order indicators of a second-order network structure factor, while network content was specified as an outcome of network structure.

Each of the models provided an adequate fit to the data. Given that Model B is nested within Model A, we compared the two models using a chi-square difference test. The result was not significant (χ^2diff = 3.89, $p = .14$; see Table 2), suggesting that Model B is preferred over Model A. No such test could be used to compare Models B and C because the two are statistically equivalent, as evidenced by their identical fit statistics. In other words, the difference between these two models is a conceptual distinction. In Model B, network content and network structure are on similar footing as indicators of one underlying social capital factor, while in Model C, network content is conditional on an underlying network structure factor. Using theory as a guide, Model C is most consistent with Lin's (2001) network theory of social capital and with the scholarship of others who theorize that characteristics of network structure prefigure access to network resources (Bankston & Zhou, 2002; Bourdieu, 1986).

Construct Validity

We used several strategies to explore some aspects of construct validity, or the degree to which a measure adequately captures the theoretical construct it intends to assess (Westen & Rosenthal, 2003). In this section, we discuss our

approach to predictive, concurrent, convergent, and discriminant validity (see "Procedure" section for details about face and content validity).

Predictive validity represents the extent to which a new measure predicts some relevant event or outcome. We considered predictive validity by examining how social capital as process (Model C; see Figure 1) was related to three relevant external referents, including grades, attendance, and plans to enroll in a 4-year college. The Mplus "MODEL INDIRECT" command was used to obtain three types of mediation output that parallel the three conditions Baron and Kenny (1986) described as necessary for mediation: total effects, indirect effects, and direct effects.

Each of the three models demonstrated a good fit to the data (see Table 3) and explained between 18% (attendance) and 45% (4-year plans) of the variability in the external referent. Both network structure and network content were positively and significantly associated with a participant's grade point average (GPA), with his or her attendance rate, and with his or her plans to enroll in a 4-year college or university following high school (see Table 3). Furthermore, for each of the three outcomes, the combined (total) effect of network structure and content was positive and significant. Finally, network structure had a significant indirect association with both GPA and 4-year enrollment plans via its association with network content (access to resources). In both cases, network content partially mediated the association between network structure and the outcome.

Concurrent validity refers to the ability of a measure to distinguish between groups that should be different. Existing research on social capital among youth has not established consistent differences in levels of social capital among different groups, posing challenges for the evaluation of concurrent validity. However, we did explore potential differences in network structure and content according to grade level, gender, free or reduced-price lunch status, and race/ethnicity. Eligibility for free or reduced-price lunch shared a significant negative association ($p \leq .05$) with the second-order network structure factor, while participants in Grades 11 and 12 had higher levels on the network content factor relative to participants in Grade 9 ($p \leq .05$, respectively). Although we did not observe other significant group-level differences in network structure and content, it is possible that additional differences went undetected due to sample size constraints.

Convergent validity suggests that different measures of the same construct should be strongly related, while discriminant (or divergent) validity is marked by weak or nonexistent relationships between measures of constructs that are theoretically distinct. There is currently no established measure of social capital among youth to which we could compare the measure presented here, making it difficult to evaluate convergent validity. However, we

Table 3. Indirect, Direct, and Total Effects of Network Structure and Network Content on Three External Referents.

	GPA			Attendance rate			Four-year plans		
	Indirect	Direct	Total	Indirect	Direct	Total	Indirect	Direct	Total
Network structure	.08 (.04)*	.35 (.10)***	.43 (.09)***	.05 (.03)	.34 (.09)***	.39 (.09)***	.10 (.05)*	.50 (.13)***	.60 (.12)***
Network content		.26 (.09)**			.17 (.10)†			.32 (.11)***	
Model fit statistics									
χ^2 (*df*)	195.35 (130), p = .00			186.87 (130), p = .00			197.31 (130), p = .00		
CFI	.93			.94			.93		
RMSEA (90% CI)	.06 [.04, .08]			.06 [.04, .07]			.07 [.04, .08]		
R^2	.25			.18			.45		

Source. Youth Social Capital and College Knowledge Survey and district data (n = 140).
Note. Standard errors for the indirect effects were estimated using the delta method and any additional bias in the standard errors was corrected for through the use of the bootstrap procedure in Mplus. CFI = comparative fit index; RMSEA = root mean square error of approximation; CI = confidence interval.
†$p \leq .10$. *$p \leq .05$. **$p \leq .01$. ***$p \leq .001$.

used several strategies to explore discriminant validity. First, we considered the association between the latent network structure and network content factors. Because these two constructs are hypothesized as representing distinct aspects of social capital, we would expect them to be related but not strongly related, which is consistent with their positive but modest correlation ($r = .31$, $p = .001$). We also explored the relationship between one of the external referents, 4-year plans, and the number of plans ties. The number of ties from whom a student seeks information about future plans been used as a proxy for social capital in postsecondary research. To the extent that social capital in the domain of postsecondary transitions captures something besides simply the size of one's network, we would expect the number of plans ties to be less strongly related than our latent social capital factors to the hypothesized outcome (4-year plans). Consistent with this hypothesis, there was a weak correlation between the number of plans ties and planning to obtain a 4-year degree ($r = .21$, $p = .01$). In contrast, the network structure and content factors were strongly associated with 4-year plans ($r = .60$ and .49, respectively, $p \leq .001$); moreover, both were weakly associated with the number of plans ties ($r = .23$ and .27, respectively, $p \leq .05$). These results suggest that the number of ties, alone, may capture something distinct from social capital.

Again, we emphasize that these results are exploratory. A more comprehensive analysis of construct validity with respect to social capital among youth will require continued research, including iterative refinement with respect to both theory and measurement.

Discussion

This study addresses the relative absence of empirical research focused on the measurement of social capital among youth (Condon et al., 2010; Harpham, 2002; Leonard, 2005; Morrow, 1999). The results offer preliminary evidence that dimensions of youth social capital, including elements of network structure and network content, can be reliably measured and that these dimensions of social capital are interrelated in a manner consistent with theory. The results also offer initial support for the validity of the social capital construct as conceptualized here, within the domain of postsecondary transitions. Below we discuss directions for future research surfaced by these findings.

Using Lin's (2001) theory of social capital to integrate normative- and resource-oriented perspectives on social capital, we set out to measure dimensions of youth social capital reflecting both network structure and network content. Specifically, we explored the nature of associations among the different dimensions of youth social capital by investigating a correlated traits

model (Model A, see Figure 1) and two conceptualizations of a second-order factor model (Models B and C; see Figure 1). Both construct reliability and CFA results supported each operationalization of youth social capital in the domain of postsecondary transitions. All Cronbach's alpha values fell above the accepted .70 threshold, and fit indices for each of the CFA models we considered were consistent with guidelines for good-fitting models. However, Model C, which reflects social capital as a process rather simply a quantity, is most consistent with the hypothesis that network structure facilitates or impedes access to network resources (Bankston & Zhou, 2002; Bourdieu, 1986; Lin, 2001). Future research based on longitudinal data from a larger sample will be necessary to confirm or disconfirm this conceptualization.

We note that many of the indicators used to measure different dimensions of social capital were based on name generator and interpreter items which, although well-established tools for collecting information about social capital, are not without limitations. For instance, there is no standard list of generators and, based on their placement within a questionnaire, name generators are also susceptible to context effects (Marin & Hampton, 2007). Moreover, there is a lack of consensus in the field about whether the number of names an individual may list should be fixed. Constraining the number of names, as we did with both name generators used in this research, may lead some participants to list more names than they might otherwise due to social desirability bias (i.e., the instruction to name up to five ties may suggest to some participants that they should be able to name five ties); on the contrary, it may place a false ceiling on network size for other individuals (Carolan, 2014). However, allowing an unconstrained number of ties can quickly create a time burden, given that participants must respond to name interpreter items for each named tie. Thus, we see a need for subsequent studies that use planned variability in both the placement and the nature (i.e., domain, level of specificity, allowed number of names) of name generator items to investigate how changes in these characteristics of name generators may influence the apparent nature of youth social capital and its relationship with youth outcomes.

We also explored the extent to which network structure and network content varied according to grade level, gender, socioeconomic status, and race/ethnicity. We encountered preliminary evidence that eligibility for free or reduced-price lunch is negatively associated ($p \leq .05$) with network structure, which encompasses both network location and collective assets. In addition, participants in Grades 11 and 12 had higher levels on the network content factor relative to participants in Grade 9. However, it is possible that greater variability in network structure and content exists according to subgroup membership than we were able to detect given the sample size.

We ultimately faced challenges in trying to characterize the extent to which students' networks included ties from socially similar (bonding) versus socially dissimilar (bridging) backgrounds, which is an important distinction for gauging the quality, and not simply the quantity, of network-based resources. For example, Granovetter (1973) suggested that weaker ties (i.e., bridges) provide better access to information, and Lin (2001) suggested that the embeddedness of resources (i.e., the wealth, status, and power of one's ties) contributes to variability in the potential for social capital to generate returns. The district we worked with to collect these data specified that participants could not be asked to speculate about the socioeconomic characteristics of their named ties, given the potential for such items to generate discomfort. Moreover, while the perceived wealth and education level of ties are often used to gauge bridging social capital among adults, the extent to which youth are able to make valid assessments about the socioeconomic characteristics of their peers and especially others they know less well, including other adults, is unclear. We are especially interested in the potential for future investigation to develop innovative strategies that can be used to characterize the network ties of young people as constituting access to bonding and bridging social capital in various domains.

We also considered the extent to which our results provide preliminary evidence supporting the validity of the youth social capital construct as operationalized in this study. With respect to predictive validity, both network structure and network content were positively and significantly associated with participants' GPA, attendance rate, and plans to enroll in a 4-year college or university following high school. Furthermore, the combined (total) effect of network structure and content was positive and significant for each of these external referents. Also consistent with Lin's (2001) network theory of social capital, network content partially mediated the association between network structure and both GPA and 4-year enrollment plans. However, future research that includes data on later outcomes (e.g., college enrollment status) will be necessary to more fully investigate predictive validity.

The modest correlation between the two latent factors hypothesized as representing network structure and network content suggests that these two factors discriminate between these two distinct aspects of social capital. In addition, unlike the latent network structure and content factors, the number of ties with whom the participant discussed his or her future plans was only weakly related to 4-year plans. The number of individuals with whom a student reports discussing job or education plans has been used as a proxy for social capital in previous research, yet our results suggest that social capital captures more than simply the size of one's network.

Social capital has been hypothesized as both represented by and related to an extremely diverse range of concepts, which has not only placed the concept at risk of losing any distinct meaning (Portes, 1998) but also created challenges for assessing construct validity. Given that construct validation involves a perpetual process of refining both theory and measurement (Westen & Rosenthal, 2003), future research should continue to develop and refine both theory and measurement related to social capital among youth in different domains, which will facilitate a more robust and comprehensive investigation of construct validity. One logical next step will be to confirm or disconfirm the results observed here with longitudinal data from a larger, more diverse sample.

Finally, we remind the reader that participants in this research included a nonrandom, cross-sectional sample of high school students. Mouw (2006) suggested that the lack of clarity within the literature investigating the effect of social capital arises due to endogeneity; individuals exercise choice when forming relationships and this nonrandom process could reflect a selection effect rather than a relational effect. Although we are unable to address this issue in the current study, one benefit of this research is the creation of an instrument that can be used as an outcome measure in future longitudinal research that attempts to manipulate youth social capital to study the potential effects of social capital on postsecondary preparation and outcomes. In particular, results from initial studies like this one, in which significant associations are observed even despite reduced statistical power, clearly mark directions for subsequent study (Bacchetti, Deeks, & McCune, 2011). Future research focused on the impact of interventions that attempt to shift relational dynamics would be especially valuable to the field given that few studies have addressed whether and how policy or institutions may intentionally foster the creation of social capital (Coburn & Russell, 2008; for a recent exception among parents of school-age children, see Gamoran et al., 2012).

The arguably critical relational dynamics of educational processes have been too often overlooked when making decisions about education policy and practice (Ream, 2005). This oversight has been exacerbated by the lack of empirically based measures of social capital in educational domains. Through an explicit focus on the measurement of social capital among youth in the domain of postsecondary transitions, this research offers an initial response to the need for more careful and rigorous empirical scrutiny of whether and how relationships matter for youth. The need for continued research remains significant.

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