COMMUNITY CAPACITY AND BEHAVIOR PROBLEMS AMONG ADOLESCENTS:
A CONTEXTUAL EFFECTS STUDY USING MULTILEVEL LOGISTIC REGRESSION

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Abstract

BRIDGET ELIZABETH WELLER: Community Capacity and Behavior Problems Among
Adolescents: A Contextual Effects Study Using Multilevel Logistic Regression
(Under the direction of Gary L. Bowen, Ph.D.)

The present dissertation explored the influence of community capacity on behavior

problems among adolescents. This study used 1990 census data and the National School

Success Profile data set, which comprised a nationally representative sample of 6th- through

12th-grade students ($N = 2,099$) nested within 93 communities. The study used a contextual

effects measurement approach and multilevel logistic regression to examine reports on four

dependent variables (drug use, drinking, smoking, and sexual behavior). The study neither

proved nor disproved study hypotheses.

The present study highlights the need for complex contextual effects models. It

suggests the need for conceptual frameworks that include both mediators and moderators

such as caregiver support and community peer behavior problems. It also highlights the

nuances associated with measuring dependent variables and establishing the structure of

random effects in hierarchical generalized linear models. Finally, the study suggests that

community interventions should extend beyond community capacity to include adolescents'

caregivers and peers.

To Shon

Acknowledgments

I thank Dr. Gary L. Bowen for his guidance on selecting a theoretical perspective and for introducing me to the contextual effects measurement approach. I thank Dr. Natasha K. Bowen for her unwavering support and continued belief in me; you are a true mentor and role model. I thank Dr. Shenyang Guo for teaching me to love the art of statistics. I thank Dr. Oscar A. Barbarin for his generous support and being an ear to my ramblings. I thank Dr. Eric A. Stewart for encouraging me to reach higher than I ever thought possible.

To my Mother, you are my rock, support, and the wind that allows me to soar. Every daughter needs a Mom that loves and believes in her. I love you, Mom! To Shon, you are my inspiration and the reason I preserve; you have changed my life. I thank you for being you. To Lawrence, thank you for showing me that great men exist. To Bree Kalb, thank you for guiding, supporting, and helping me through these years. You are a role model for every social worker. To Karyl, thank you for late nights in the doc suite and discount retail therapy. To Renee, I love you, Nay-Nay. You have seen me through it all and held me together. To Mrs. Kupperberg, I thank you for earring words.

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Chapter 1: Behavior Problems Among Adolescents

Researchers have demonstrated that a large proportion of adolescents engage in severe problem behavior (Centers for Disease Control [CDC], 2006; Federal Bureau of Investigation [FBI], 2007; National Center for Education Statistics [NCES], 2005). According to the CDC's (2006) report *Youth Risk Behavior Surveillance,* 38.4% of adolescents have used marijuana at least once in their lifetime. Additionally, within 30 days of survey administration, 25.5% of adolescents consumed five or more alcoholic beverages and 23% smoked at least one cigarette; 14.3% of the sample had at least four sexual partners during their lifetime. Such problem behaviors are markers for youth-related problems, such as teenage pregnancy and school failure (Hope, Wilder, & Watt, 2003; Viljoen, O'Neill, & Sidhu, 2005).

Behavior problems have adverse consequences for youths, caregivers, and society. For example, adolescents who have engaged in behavior problems also tend to experience academic difficulties (Viljoen et al., 2005). Furthermore, caregivers of adolescents with behavior problems experience elevated rates of mental health disorders such as depression (Renk, 2007). The behavior problems of some youths also have the potential to jeopardize the safety of other youths around them (NCES, 2005) and, consequently, society bears an increased financial cost, highlighting another consequence linked with behavior problems. Thus, the behavior problems of certain youths affect multiple levels of the community, from the adolescents themselves to their families and schools to society as a whole.

Community scholars have advocated the use of a social organization perspective to understand youth behavior problems (Mancini, Bowen, & Martin, 2005; Sampson, 2002; Wilson, 1987). Social organization, in general, refers to the "collection of values, norms, processes, and behavior patterns in a community that organize, facilitate, and constrain the interactions among community members" (Mancini et al., 2005, p. 319). A social organization perspective essentially identifies community mechanisms that can influence individual behavior.

Social organization theorists have hypothesized that community capacity—one aspect of social organization in a community—functions as a mechanism to deter behavior problems (Mancini et al., 2005). Community capacity refers to the extent to which community members demonstrate a shared responsibility for one another and take collective action to accomplish goals and to meet challenges in the community (Mancini, Martin, & Bowen, 2003). In communities with high community capacity, youths have the opportunity to interact with adult community members and establish strong social bonds. Theoretically, these social bonds foster youths' commitment to social norms and thereby discourage their engagement in problem behaviors (Hirschi, 2002).

Although scholars have theorized that community capacity can deter problem behavior and promote prosocial behavior, few empirical studies have examined this relationship (Mancini et al., 2003). The present dissertation aims to fill this gap in the literature. Specifically, I posit a contextual effects conceptual model. In the model, group-level and individual-level community capacity are considered a deterrent to behavior problems among adolescents. In addition, the model depicts group-level community capacity as moderating the relationship between individual-level community capacity and behavior

problems. In other words, adolescents residing in and reporting a community with low community capacity have the highest probability of behavior problems. The present study discretely and simultaneously examined the influence of individual-level and group-level community capacity on behavior problems among adolescents.

Contribution to Social Work Literature and Practice

The present dissertation contributes to literature on behavior problems and social work practice in four ways. First, it focuses on community capacity, a neglected area of study. Most community researchers have conceptualized and measured collective efficacy or collective socialization, which assess community members' sentiment toward participation in youths' lives (Browning, Burrington, Leventhal, & Brooks-Gunn, 2008; Cantillon, 2006; Sampson, 2002; Simons, Simons, Conger, & Brody, 2004). Although collective efficacy and collective socialization are similar to community capacity, community capacity more specifically reflects the demonstration of monitoring and supervision adolescents receive from adult community members (G. L. Bowen, Richman, & Bowen, 2000). It emphasizes active community involvement (Mancini et al., 2003).

Second, the present study developed and tested a contextual effects model, whereas previous community studies have usually used contextual measurement or compositional measurement approaches (e.g., G. L. Bowen & Pittman, 1995; N. K. Bowen & Bowen, 1999; Sampson, 2002). A contextual measurement approach assesses youths' perception of their community and a compositional approach uses proxy variables to measure community characteristics (Mancini et al., 2005). Although both methods provide insight into the predictors of behavior problems, they fail to directly assess group-level processes external to the individual. A contextual effects measurement approach, on the other hand, directly

assesses the influence of group-level variables on individual-level variables by using

aggregate or global variables, after controlling for relevant individual-level variables

(Blalock, 1984; Mancini et al., 2005; Roux, 2002).

According to Blalock (1984), "The essential feature of all contextual effects models is

an allowance for macro processes that are presumed to have an impact on the individual actor

over and above the effects of any individual-level variables that may be operating" (p. 354).

Contextual effects models have enabled scholars to conceptualize multilevel and cross-level

propositions of behavior problems. Furthermore, these models have helped combat the

omitted variable bias that may yield spurious results (Shadish, Cook, & Campbell, 2002) and

that, according to Sampson (2002), has been an important limitation in community studies.

Third, this dissertation adds to the literature on cross-level interactions. Specifically,

the present study examined the joint effect of individual-level and group-level community

capacity on behavior problems among adolescents. Relatively few studies have examined

individual-level and group-level community member involvement in the lives of youths;

even fewer have tested cross-level interactions (Wickrama & Bryant, 2003). Addressing joint

effects can provide a deeper understanding of the interaction of community characteristics

with individual characteristics to influence behavior problems among adolescents.

Finally, the present work contributes to social work practice on community

interventions. Community interventions are particularly important for adolescents because

approximately 40% of an adolescent's day is unstructured time (Bartko, 2003). Research has

demonstrated that unstructured time is associated with an increased risk of behavior problems

(Eccles, 2003). Research on community capacity can inform practitioners' development of

interventions that either build or leverage this asset, which may ultimately deter behavior problems among adolescents (Chaskin, 1997; Coulton, 2005).

Thus, the present dissertation contributes to social work literature and practice by focusing on group-level and individual-level community capacity, a neglected area of research. It also depicts a contextual effects model and employs a contextual effects measurement approach. By understanding the role of community capacity in the lives of youths, social work practitioners may enhance community interventions.

Definitions

Scholars have used the terms *behavior problem* and *community* to refer to a number of constructs. Consequently, the literature related to these two terms is vast and ambiguous. To establish study parameters and clarity, I provide brief definitions of each term.

Behavior Problem

The term *behavior problem* encompasses a number of concepts, including misbehavior, aggressiveness, antisocial behavior, delinquency, and conduct disorder (Hirschi, 2002; Loeber, Burke, Lahey, Winters, & Zera, 2000). Researchers from various disciplines have used the term to refer to a wide range of actions. In the present discussion, the term *behavior problem* refers to a specific action that is contrary to societal norms and that, when detected, receives a sanction. This definition is consistent with psychological and sociological definitions of the term (Bartlett, Holditch-Davis, & Belyea, 2005; Hirschi, 2002; Jessor, 2001). In mental health literature, for example, the term *behavior problem* has been used to refer to actions that are considered "undesirable by the social and/or legal norms of conventional society and its institutional authority; it is behavior that usually elicits some form of social control response, whether minimal . . . or extreme" (Jessor, 2001, p. 83). In

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criminological literature, the term *behavior problem* has been used to refer to actions that, when detected, "result in punishment of the person committing them by agents in the larger society" (Hirschi, 1969, p. 46). The current definition allows for the inclusion of a broad span of literature.

This definition further assumes that behavior problems are categorical. Currently, scholars debate about whether behavior problems should be considered categorical or dimensional. On one hand, researchers can conceptualize behavior problems as categorical, as being either present or absent (Bartlett et al., 2005). Although this approach is useful in selecting interventions in some practice settings, it does not capture nondiagnostic behavior problems. On the other hand, researchers can conceptualize behavior problems as dimensional, meaning that behavior problems fall along a continuum. In the present dissertation, the term *behavior problem* is used categorically.

Community

Community is an all-encompassing term that refers to a variety of different constructs, and it often has been used interchangeably with the term *neighborhood* (Chaskin, 1997). Consistent with previous scholarship, the term *community* here refers to a social unit with geographical, interpersonal, or psychosocial boundaries (Chaskin, 1997; Coulton, 2005). A boundary encompasses a group of individuals with shared circumstances within a geographic location. Boundaries are established through connections with others, through institutions, and through culture, based on "shared beliefs, circumstances, priorities, relationships, or conditions" (Chaskin, 1997, p. 522). Community differs from neighborhood because the term *neighborhood* denotes a spatial construct that defines geographical boundaries (Chaskin, 1997; Coulton, 2005).

Furthermore, the term *community* comprises two aspects: community structural characteristics and community processes. Community structural characteristics are indicators of social structures, or "organized patterns of behavior or experiences that persist in space and time and which are created by two or more people" (Shanahan & MacMillan, 2008, p. 9). Communities are orderly systems that include a number of social institutions, such as the economy, family, and education. Community processes, on the other hand, are mechanisms external to the individual that account for the influence of the community on one's behavior (Blau, 1960). Researchers have hypothesized that community processes moderate the influence of community structural characteristics on outcomes (Mancini et al., 2005).

Scholars have conceptualized community in two ways: community with an uppercase *C* and community with a lowercase *c* (Mancini et al., 2005). Researchers who conceptualize community with an uppercase *C* evaluate organizational fields, such as nonlocal policies at the state and federal level (Arum, 2000). Scholars who conceptualize community with a lowercase *c*, on the other hand, focus on community structural characteristics and community processes, often within structural boundaries (e.g., county, zip code, or census track) (Mancini et al., 2005). Although scholars have distinguished between these differing perspectives on community, they also have acknowledged the existence of a reciprocal relationship between the two viewpoints. The term *community,* as defined in the present dissertation, follows a lowercase *c* perspective of community.

Dissertation Organization

This dissertation is organized as follows. Chapter 2 presents a rationale for studying behavior problems among adolescents and presents the conceptual model guiding this study and its research questions. Chapter 3 describes the methods used to examine the questions.

Chapter 4 presents study findings. Chapter 5 discusses the implications of study results and

presents directions for further research and social work practice.

Chapter 2: Adolescent Behavior Problems and Community Capacity

The following chapter is organized into four sections. The first section presents a rationale for studying behavior problems among adolescents. The second section discusses consequences often associated with behavior problems. The third section provides a conceptual model, as well as relevant theoretical and empirical support, for each hypothesized link in the model. The final section states the research questions tested in the study.

Statement of the Problem

The empirical literature has indicated that a high proportion of adolescents engage in severe problem behavior (CDC, 2006; FBI, 2007; NCES, 2005). Research also has shown that behavior problems among youths vary by adolescent demographics, including gender, age, race, and socioeconomic status. Studies have consistently shown that males engage in more severe problem behavior than females (Bartlett et al., 2005; CDC, 2006; NCES, 2005). For example, males used marijuana, drank, smoked, and engaged in sexual activity more often than females (CDC, 2006; NCES, 2005). Also, 16.5% of males had engaged in sexual intercourse with four or more partners, compared with 12% of females (NCES, 2005). Together, these statistics suggest that adolescent males are more likely than females to demonstrate severe behavior problems.

Studies also have reported that the prevalence of behavior problems increases as adolescents become older. For example, older adolescents reported more drug use, alcohol consumption, smoking, and sexual intercourse than younger adolescents (CDC, 2006; NCES, 2005). According to the CDC (2006), 27.6% of 12th-grade students reported smoking, compared to 19.7% of 9th-grade students. These trends suggest that the prevalence of severe behavior problems increase as a youth progress through adolescence.

In addition, scholars have reported that types of behavior problems varied by racial demographics. For example, a higher percentage of adolescent European Americans (25.9%) than adolescent African Americans (12.9%) reported smoking (CDC, 2006). On the other hand, 47.4% of African American male adolescents reported engaging in sexual intercourse, compared to 32% of European Americans (CDC, 2006; NCES, 2005). These statistics suggest that some behavior problems may vary by race, which has implications for prevention and intervention programs. For example, if European Americans use more substances than African Americans, then European Americans may benefit more than African Americans from interventions targeting substance use.

Although it remains a subject of debate, some community research has shown that lower–socioeconomic status youths engage in more problem behaviors than do adolescents from more affluent homes (Wright, Caspi, Moffitt, Miech, & Silva, 1999). For example, Hay, Forston, Hollist, Altheimer, and Schaible (2006) conducted a study using a nationally representative sample of high school students and found an association between behavior problems and adolescents who grew up in poor families, particularly among those residing in poor communities.

Researchers must interpret the current state of the literature and the corresponding data with caution, and number of methodological concerns should be noted. First, most measures of behavior problems have relied on indirect assessments reported by an adult or parent (CDC, 2006; Nash, 2002; NCES, 2005). Indirect assessment can result in error because youths may underreport incidences of behavior problems to adults or others may have a limited view of adolescent behavior (Carmines & Zeller, 1979). Thus, adolescent self-report data may be more reliable than indirect assessments of behavior problems (Connell & Farrington, 1997).

Second, researchers have administered self-reported measures in selected settings, such as schools and clinics, thereby excluding adolescents from outside of these settings (Henry, 1990). The *Indicators of School Crime and Safety* survey, for example, sampled youths enrolled in schools and omitted adolescents not attending school (NCES, 2006). On the other hand, researchers have generally administered the Child Behavior Checklist to individuals referred for mental health services (Lambert, 2003), thus omitting youths not referred for clinical services.

Third, surveys of behavior problems have omitted certain offenses because surveys tend to be discipline specific (Henry, 1990; NCES, 2005). For example, the Child Behavior Checklist, which assumes a mental health perspective, measures various symptoms of mental health; however, it omits questions that identify other symptoms, such as bullying (Achenback, 1992). As a result, this survey overlooks nondiagnostic behavior problems. On the other hand, the School Success Profile, which follows a social work framework, assesses youths' reported behavior problems at school and omits questions regarding youths' mental health.

Significance of the Problem

Regardless of adolescents' demographics, research has shown an association between behavior problems and a number of adverse consequences. For example, practitioners have reported an association between adolescent behavior problems and school challenges. In particular, adolescents with behavior problems have weak connections to school, increased likelihood of dropping out of school, and more academic difficulty (Bowen, Rose, & Glennie, 2009; Viljoen et al., 2005). Some behavior problems place adolescents at risk of suspension or expulsion from school. These corrective sanctions may yield both short-term and long-term consequences for adolescents, such as an increased potential for school dropout and adult unemployment (National Association for the Advancement of Colored People, 2006).

Furthermore, adolescent behavior problems have created challenges for families (Viljoen et al., 2005). Caregivers of adolescents with behavior problems have exhibited more mental health symptoms than caregivers of adolescents without behavior problems; however, the direction of this relationship remains unclear, and researchers have attempted to understand whether caregiver mental health influences adolescent behavior or if the converse is true (Pastore, Fisher, & Freidman, 1996; Renk, 2007). In addition, caregivers of adolescents with behavior problems have reported increased financial loss due to, for example, missing work to attend school meetings on the adolescents' behalf (Leckman, 1995). Siblings of adolescents with behavior problems also have difficulties. For example, research has demonstrated that siblings of adolescents with behavior problems also have an increased likelihood of behavior problems (Snyder, 2005).

Behavior problems also impede adolescents' ability to participate in the community as they enter adulthood. For example, adolescents who have dropped out of school have

difficulties finding employment as adults. In today's competitive economy, employers require skilled laborers, and the lack of a high school education places individuals seeking employment at a deficit (Leckman, 1995). Consequently, society has suffered a loss of economic and social resources because these individuals have failed to become productive citizens.

Contextual Effects Conceptual Model of Behavior Problems

Social organization scholars have conceptualized contextual effects models to theorize potential predictors of behavior problems (Mancini et al., 2003). The number of contextual effects studies has increased, though relatively few of these studies have focused on community capacity.

The contextual effects model (Figure 1) focuses primarily on behavior problems among adolescents. It demonstrates that variation in behavior problems results directly from the influence of group-level community capacity (path A) and individual-level community capacity (path B). Moreover, the influence of individual-level community capacity on behavior problems varies according to group-level community capacity and, all other things being equal, adolescents who perceive their community to have low community capacity—and whose group-level community capacity is low—have the highest probability of behavior problems (path C).

The conceptual model suggests three hypotheses. First, group-level community capacity has a direct effect on behavior problems. Second, individual-level community capacity is inversely associated with behavior problems among adolescents. Third, the influence of individual-level community capacity on behavior problems varies according to the level of community capacity in a community.
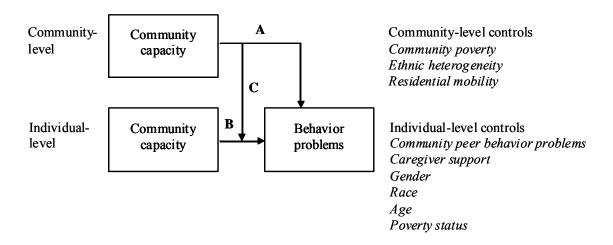
Community-level — Community capacity

A

C

Individual-level — Community capacity

B

Behavior problems

Community-level controls
Community poverty
Ethnic heterogeneity
Residential mobility

Individual-level controls
Community peer behavior problems
Caregiver support
Gender
Race
Age
Poverty status
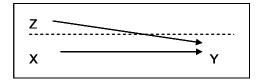
Figure 1. Contextual effects conceptual model

As shown in Figure 2, the first hypothesis represents a multilevel proposition (path A),

the second hypothesis shows a micro-level proposition (path B), and the third hypothesis

indicates a macro-micro proposition (path C) (Snijders & Bosker, 1999; Tacq, as cited in

Snijders & Bosker, 1999).
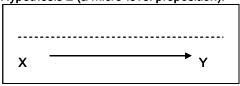
Empirical Support for Model Links

Previous community research on behavior problems examined community structural

characteristics, including socioeconomic status, ethnic heterogeneity, and residential mobility,

as measured by community composition (Leventhal & Brooks-Gunn, 2000). Such

compositional studies have yielded inconsistent findings. For example, Stewart, Simons, and

Conger (2002) found an association between community low socioeconomic status and

behavior problems among youths, whereas Simons et al. (2004) detected no such connection.

Although some researchers have reported a link between high residential mobility and

adolescent behavior problems (Beyers, Loeber, Wikstrom, & Stouthamer-Loeber, 2001;
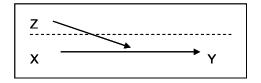
Hypotheses 1 (a multilevel proposition):

Hypothesis 2 (a micro-level proposition):

Hypothesis 3 (a macro-to-micro-proposition):

Y: Odds of behavior problems
X: Individual-level community capacity
Z: Group-level community capacity

Figure 2. Graphical representation of study propositions

Chung & Steinberg, 2006; Haynie, Silver, & Teasdale, 2006), other studies have indicated no

statistically significant relationship (McNulty & Bellair, 2003; Rankin & Quane, 2002).

Several scholars have theorized a connection between ethnic heterogeneity and behavior

problems (Sampson & Groves, 1989; Shaw & McKay, 1942); however, Chung and Steinberg

(2006) obtained no significant results through empirical investigation.

The lack of consistent findings has led some scholars to search for possible processes

operating in the community. Community processes are mechanisms external to an individual

that account for the influence of community on the individual and that may moderate the

influence of individual-level or group-level characteristics on the individual's behavior.

Social organization scholars contend that youths residing in communities with aversive community processes and who self-report detrimental individual characteristics have the highest probability of behavior problems.

Social organization theorists also have hypothesized that community capacity functions as a community process to deter behavior problems (Mancini et al., 2005). As stated previously, community capacity refers to the amount of monitoring and supervision adolescents receive from adult community members (G. L. Bowen et al., 2000) and the extent to which community members demonstrate a shared responsibility for one another and take collective action to accomplish goals and meet challenges in the community (Mancini et al., 2003). Community capacity can help address community challenges (G. L. Bowen et al., 2000).

Researchers have assumed that community capacity operates to influence an adolescent's behavior. First, social organization scholars have contended that community capacity may function beyond adolescents' awareness (Mancini et al., 2003). This supposition is consistent with a realism perspective, which suggests that community processes may result in variation in outcomes (Boss, 1993; Lewis & Smith, 1981). Other theorists contrast realism with a nominalism perspective, asserting that only external factors within an individual's consciousness influence his or her behavior. A realism perspective, on the other hand, indicates that community processes can operate beyond an individuals' awareness (Lewis & Smith, 1981).

Based on the realism perspective, I hypothesized that group-level community capacity has a direct effect on behavior problems. Few studies have examined group-level community capacity, though several scholars have examined concepts that mirror community

capacity, including collective socialization and social organization (Cantillon, 2006; Simons et al, 2004). For example, to examine collective socialization, Simons et al. (2004) used data from 46 census block groups and from the Family and Community Health Study, which collected information from 10- to 12-year-old African American adolescents in Georgia and Iowa and their caregivers. To measure collective socialization, the authors aggregated caregivers' reports on an 8-item scale, assessing their perception of adult involvement in the community, to the census block level, thus creating a group-level mean score of collective socialization. The study found that collective socialization was inversely associated with behavior problems.

Studies of concepts mirroring community capacity have exhibited inconclusive findings. For example, Browning et al. (2008) found that collective efficacy was inversely associated with behavior problems among a sample of 11- to 16-year-olds in Chicago. Cantillon (2006), on the other hand, detected no link between community social organization and behavior problems in a sample of 10th-grade students from one Midwestern city. Given the limited research on community capacity and the inconsistent findings of studies examining community member involvement, the role of community capacity in deterring behavior problems requires further investigation.

Social organization scholars have also theorized that individual-level community capacity can deter behavior problems among adolescents (Mancini et al., 2003). Social control theory indicates that community capacity can provide youths with opportunities for positive interactions with adult community members, which in turn fosters a commitment to social norms and greater self-control (Hirschi, 2002). On the other hand, the social disorganization perspective indicates that adolescents may engage in behavior problems

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when community capacity becomes weak or severed in a community (Hirschi, 2002; Shaw & McKay, 1942).

Community capacity, established through direct interactions with community members, is particularly important for adolescents because, during this stage of development, noncaregivers help youths establish their identity and define their social roles (Erikson, 1963, 1980). Communities with high capacity thus help youths cultivate bonds with adult community members, which subsequently aids in the youths' development of self-control and avoidance of behavior problems (Mancini et al., 2003).

Drawing on the argument that community members develop bonds with youths, I hypothesized that individual-level community capacity is inversely associated with behavior problems among adolescents. Contextual studies provide some limited support for this hypothesis. For example, using structural equation modeling, N. K. Bowen, Bowen, and Ware (2002) examined the influence of social disorganization on adolescent behavior problems. Although the study did not specifically focus on community capacity, it created a composite score of community member behavior. In conjunction with two other measures, this score was used to represent a latent factor the authors called social organization. N. K. Bowen et al. found that social disorganization (the inverse of social organization) was associated with behavior problems. The social organization perspective further suggests that individual-level and group-level community capacity operates jointly to influence youths' behavior (Mancini et al., 2003). This supposition is consistent with a contextual dissipation standpoint, which contends that community characteristics can spill over into individual-level features and jointly influence outcomes (Wickrama & Bryant, 2003). For example, a contextual dissipation standpoint suggests that group-level community-capacity interacts

with individual-level community capacity to influence an individual's behavior, thus indicating that cross-level interactions occur.

As shown in Figure 3, based on the contextual dissipation argument, I hypothesized that the influence of individual-level community capacity on behavior problems varies according to the level of community capacity in a community and that, all other things being equal, adolescents who report low community capacity and who reside in communities with low community capacity will have the highest probability of behavior problems. I am not aware of any studies that have tested the cross-level interaction of community capacity on behavior problems.
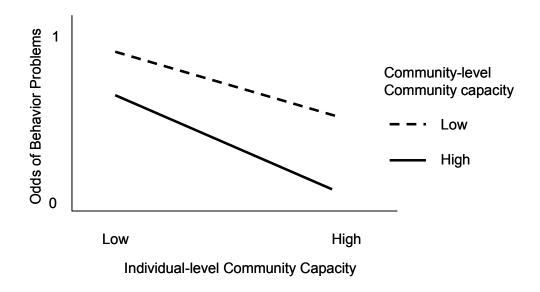

Figure 3. Graphical representation of study hypothesis number 3

Controls

According to Sampson (2002), one theoretical and methodological challenge in community research is the possibility of omitted variables. Omitted variables may cause

biased results and inflated estimates (Shadish et al., 2002). Thus, researchers must control for community and individual factors (Haynie et al., 2006; Leventhal & Brooks-Gunn, 2000; Sampson, 2002).

Based on an examination of the literature, the model used here included nine controls. At the community level, the model controlled for community socioeconomic status, ethnic heterogeneity, and residential mobility, as measured by community composition. In general, research has shown that low community socioeconomic status is associated with adolescent behavior problems (Beyers et al., 2001; Bruce, 2004; Chung & Steinberg, 2006; Cleveland, 2003; Hay et al., 2007; Lynam et al., , 2000; McNulty & Bellair, 2003; Stewart et al., 2002; Wight, Botticello, & Aneshensel, 2006); however, several studies failed to find a relationship (Rankin & Quane, 2002; Simons et al., 2004).

Several studies have reported a link between high residential mobility and adolescent problem behavior (Beyers et al., 2001; Chung & Steinberg, 2006; Haynie et al., 2006). For example, using a nationally representative sample of high school students, Haynie et al. (2006) found that high residential mobility was positively associated with behavior problems among adolescents. Conversely, however, other studies have failed to discover any such relationship (McNulty & Bellair, 2003; Rankin & Quane, 2002).

Scholars also have argued for the inclusion of ethnic heterogeneity in community studies of behavior problems (Sampson & Groves, 1989; Shaw & McKay, 1942). Although a meta-analysis has reported little support for this relationship (Leventhal & Brooks-Gunn, 2000), researchers have continued to include measures of ethnic heterogeneity in their studies (Haynie et al., 2006; Sampson & Raudenbush, 1997).

At the individual level, the contextual effects conceptual model controlled for caregiver support, peer behavior problems, gender, race, age, and socioeconomic status. Researchers have frequently found that caregiver support is one of the strongest predictors of behavior problems (Hoeve et al., 2009). Furthermore, three recent contextual effects studies reported an association between parenting behaviors and behavior problems among adolescents (Cantillon, 2006; Haynie et al., 2006; Simons et al., 2004). Thus, the conceptual model controlled for caregiver support.

Additionally, scholars have consistently shown that behavior problems among peers is a predictor of individual behavior problems. Three recent contextual effects studies have supported this finding (Cantillon, 2006; Haynie et al., 2006; Simons et al., 2004). Thus, the current contextual effects model controlled for peer behavior problems to minimize omitted variable bias.

Finally, as stated previously, research has indicated that behavior problems among adolescents vary by youth demographics (CDC, 2006; FBI, 2007; NCES, 2005). Community studies of behavior problems usually have controlled for gender, race, age, and socioeconomic status (Cantillon, 2006; Haynie et al., 2006; Simons et al., 2004). Thus, the conceptual model controlled for these individual features.

In sum, the contextual effects model suggested three hypotheses and included nine controls. Drawing on a social organization perspective, each hypothesis submitted that community capacity influences behavior problems among adolescents. Given that scholars testing contextual effects models consistently controlled for community socioeconomic status, ethnic heterogeneity, and residential mobility, the conceptual model also controlled for these

proxy variables. Furthermore, because studies often found a link between youths'

demographics and behavior problems, the model included six individual-level controls.

Research Questions

Drawing on a social organization perspective, the conceptual model was designed to

examine three research questions, each of which is related to a path in the model. Specifically,

the study aimed to answer the following research questions:

1. Is community capacity within a community inversely related to behavior problems

among adolescents?

2. Are youths' perceptions of community capacity inversely associated with behavior

problems among adolescents?

3. Is the link between individual-level community capacity and behavior problems

among adolescents moderated by group-level community capacity?

Chapter 3: Methods

The following chapter is organized into five sections. The first section describes the sources of data. The second section presents the sample. The third section details study measures. The fourth section describes missing data analysis. The final section presents analysis procedures for hierarchical generalized linear modeling.

Sources of Data

The current study used two sources of data for purposes of assessing key variables: the 1993 version of the School Success Profile and the 1990 U.S. census. The 1996 National SSP (NSSP) provided student-level data whereas the 1990 census supplied community composition variables at the county and zip code levels.

National School Success Profile

The School Success Profile is an ecological survey that assesses middle and high school students' perceptions of their social environment and individual adaptation, including their community, family, school, peers, and personal adjustment. Specifically, the SSP assesses 23 dimensions, including 3 community, 3 family, 3 school, 2 peer, 3 social support, 3 self-confidence, 3 school behavior, and 3 general well-being dimensions. Scholars developed the SSP based on Bronfenbrenner's ecological model and on research that assumed a risk-and-resilience framework (G. L. Bowen, Rose, & Bowen, 2005; Richman, Bowen, & Woolley, 2004). During survey development, researchers consulted experts in the fields of adolescent development, education, and psychometrics, as well as practitioners (G.

L. Bowen et al., 2005). Researchers subjected the SSP to multiple waves of pilot testing and checks for validity and reliability.

G. L. Bowen et al. (2005) examined the psychometric properties of the SSP using a larger, nonprobability sample. Because researchers encounter challenges when using nonprobability samples (Henry, 1990), Guo and Hussey (2004) presented five strategies to minimize these issues. G. L. Bowen et al. (2005) used three of these recommendations. Specifically, the researchers tested multicollinearity using the variance inflation factor and found little evidence of multicollinearity. The researchers also used a large sample ($N =$ 16,037), which provided better estimates about the population (Guo & Hussey, 2004), and they employed a sample drawn from multiple sites across the United States, covering six states and 351 schools.

After addressing concerns with nonprobability samples, G. L. Bowen et al. (2005) found that the SSP was psychometrically sound. Specifically, application of Cronbach's alpha (α) and the Kuder-Richardson formula (KR-20) showed minimal to good reliability (DeCarlo, 1997; Kline, 2005). Furthermore, the scales yielded moderate to good construct validity and similar factor structures across race and gender for most dimensions (G. L. Bowen et al., 2005). Earlier studies had reported similar reliability and validity findings (N. K. Bowen & Bowen, 1999; Nash & Bowen, 1999).

I used the 1996 National School Success Profile (NSSP) data set to answer the research questions presented in chapter 2. This cross-sectional data set comprised a nationally representative sample of 6th- through 12th-grade students ($N = 2,099$) in the United States (Louis Harris and Associates, 1997). Between October 1996 and February 1997, Louis Harris and Associates implemented a two-stage stratified sampling design to

gather student data. This strategy mirrored the National Center for Education Statistics'

sampling approach. In the first stage, researchers selected among 80,000 possible schools and

grouped schools based on a set of criteria (grades covered, school type, and region). From

among the clusters of schools, researchers randomly selected schools to participate in the

study. Of the 224 possible schools, 102 schools participated. In the second stage of sampling,

the researchers selected one eligible grade within each school and then randomly selected

one English classroom within that grade.

1990 Census

The 1990 census collected information on the U.S. population, including such details

as household income. The census uses boundaries based on naturally occurring features such

as lakes. Working with a graduate student in the Department of Geography at the University

of North Carolina at Chapel Hill, Dr. Gary Bowen coded census data to the zip code, county,

and census track levels (U.S. Census Bureau, 2008). He subsequently merged the SSP data

with census data at the school zip code level.

Census data have limitations. For example, individuals may consider their community

to be smaller than statistical boundaries indicate (Coulton, Korbin, Chan, & Su, 2001).

Conversely, adolescents may reside in one geographic unit but commute to different units on

a daily basis (Sampson, 2002). Community characteristics also may vary within statistical

boundaries. Socioeconomic status in some communities, for example, varies by street rather

than by statistical boundaries (Blalock, 1984; Duncan, 1999).

In spite of the limitations of the census data, benefits also exist. For example, the data

are publicly available and relatively consistent over time (Coulton, 1995). Furthermore,

scholars can use statistical boundaries to examine a large number of communities across the United States.

Sample

I used the 1996 National School Success Profile (NSSP) data set to answer the research questions presented in chapter 2. This cross-sectional data set comprised a nationally representative sample of 6th- through 12th-grade students ($N = 2,099$) in the United States (Louis Harris and Associates, 1997). Between October 1996 and February 1997, Louis Harris and Associates implemented a two-stage stratified sampling design to gather student data. This strategy mirrored the National Center for Education Statistics' sampling approach. In the first stage, researchers selected among 80,000 possible schools and grouped schools based on a set of criteria (grades covered, school type, and region). From among the clusters of schools, researchers randomly selected schools to participate in the study. Of the 224 possible schools, 102 schools participated. In the second stage of sampling, the researchers selected one eligible grade within each school and then randomly selected one English classroom within that grade.

Measures

Because this study tested a contextual effects conceptual model, I employed a contextual effects measurement approach, as defined by Blalock (1984). Specifically, I coded the dependent variables and one independent variable using individual-level self-reported data, and one independent variable using an aggregate variable. Table 1 depicts the measurement statistics.

Table 1

Descriptive Statistics for Measures

Variables	Range					Indices of normality		Missing	
	Min	Max	Mean	SD	Alpha	Skew	Kurtosis	n	%
Dependent									
Drug use	0	1	9.1%	-	-	-	-	56	3
Drinking	0	1	13.3%	-	-	-	-	57	3
Smoking	0	1	13.5%	-	-	-	-	54	3
Sexual behaviors	0	1	15.2%	-	-	-	-	63	3
Community-level									
Community capacity	7	10	8.44	0.51		-0.17	0.40	0	0
Community socioeconomic status	6.40	147.41	40.50	28.30	.90	1.53	2.71	0	0
Ethnic heterogeneity	2.66	166.00	19.00	25.31	.87	3.30	13.39	0	0
Residential mobility	21.60	84.80	62.30	12.41		-0.84	1.07	0	0
Individual-level									
Community capacity	5	10	8.46	1.37	.60	-0.65	-0.34	108	5
Community peer behavior problems	4	8	5.44	5.44	.81	0.54	-1.20	104	5

Note. Means of dependent variables indicate percent of youths reporting the behavior problem.

Dependent Variables

The present study tested four dichotomous dependent variables. Four items on the SSP measured youths' behavior problems, including drug use, drinking, smoking, and sexual behavior. Each variable measured youths' report of how often during the past 30 days they had disagreements with adults in their home about the specific behavior. A 4-point response option existed (1 = *never,* 2 = *sometimes,* 3 = *often,* 4 = *does not apply*). I recoded youths' responses into a dichotomous variable (0 = *never or does not apply,* 1 = *sometimes or often*). Thus, adolescents received a score of 0 or 1 for drug use, drinking, smoking, or sexual behavior.

Independent Variables

   Individual-level community capacity. The community capacity scale comprised five

statements (α = .60). The items assessed youths' perception of the following community

member behaviors: (a) Adults in my neighborhood are interested in what young people in the

neighborhood are doing; (b) If I did something wrong, adults in my neighborhood who knew

about it would probably tell the adults I live with; (c) I feel safe in my neighborhood; (d) I

am happy with the neighborhood I live in; and (d) People in my neighborhood really help one

another out. Two response options existed on the SSP (1 = *agree*, 2 = *disagree*). I recoded

the items (1 = *disagree*, 2 = *agree*), thus making higher numbers indicate higher community

capacity. Each case received an individual score of community capacity by summing the

adolescents' responses to the statements. The scale ranged from 5 to 10.

   Group-level community capacity. To create a group-level community capacity score

for each community, I aggregated the individual community capacity composite score to

school zip code levels.

Community Controls

   To select census items to measure community controls, I conducted a principal axis

factor analysis (see Appendix for details). It showed three indicators loading on one factor

(community socioeconomic status) and two indicators loading on another factor (ethnic

heterogeneity). Although some scholars have contended that fewer than three indicators on a

factor may yield unstable results (Kline, 2005), other community studies have used factors

with two variables to assess ethnic heterogeneity (Costello & Osborne, 2005; Sampson &

Raudenbush, 1997).

Community socioeconomic status. Community socioeconomic status was measured using three items from the 1990 census data ($\alpha = .90$). The items included child poverty, households receiving public assistance, and single-parent families. The census measured child poverty by dividing the number of individuals under 17 years old living below the poverty threshold by the total population of 17-year-olds in the community, thus creating a percentage of youths in poverty for each community. It assessed the percentage of households receiving public assistance by dividing the number of households receiving at least one form of assistance (e.g., Social Security, government assistance, or Aid to Families with Dependent Children) by the total number of households in a community. The census measured the percentage of single-parent families by dividing the number of single-parent households with children 17 years old or younger by the total number of households with children 17 or younger.

Similar to the method outlined in Sampson and Raudenbush's (1997) seminal publication on collective efficacy, I developed new variables for each indicator by weighting the indicator by its factor loading. Using the weighted variables, I summed the scores of child poverty, households receiving public assistance, and single-parent families to create a composite score of community poverty.

Ethnic heterogeneity. I used two variables from the 1990 census—non-White neighbors and non–English speaking households ($\alpha = .88$)—to develop a composite of community ethnic heterogeneity. The census measured a community's percentage of non-White neighbors by dividing the number of individuals who reported being non-White by the total population of the community. It assessed percentage of households speaking a language

other than English by dividing the number of individuals who reported speaking another language at home by the total population of the community.

As with the community socioeconomic status measure, I developed new variables for each indicator by weighting the indicator by its factor loading. Using the weighted variables, I summed the scores of non-White neighbors and households speaking a language other than English to create a composite score of ethnic heterogeneity. The kurtosis index indicated a leptokurtic distribution (β_2 = 12.47), implying that these data peak higher than the expected normal distribution (Kline, 2005).

Residential mobility. I used the owner-occupied dwellings item from the census to assess residential mobility. This item measured owner-occupied dwellings by dividing the number of owner-occupied homes by the total population of the community, thus creating a percentage.

Individual-Level Controls

Community peer behavior problems. The peer behavior problems scale comprised four items (α = .81). Youths reported on how likely peers in their community were to engage in the following activities: (a) get into trouble with police; (b) use drugs; (c) join a gang; and (d) drink alcoholic beverages. Response options on the SSP comprised a 2-point scale (0 = *likely,* 1 = *unlikely*). I recoded items (1 = *unlikely*, 2 = *likely*) to make higher scores indicate more peer behavior problems. After recoding variables into the same direction, each case received an individual score of community peer behavior problems by summing adolescents' responses to the statements. The scale ranged from 4 to 8.

Caregiver support. The caregiver support scale comprised six statements (α = .93). The items assessed adult support in the home in the previous 30 days by asking about

frequency with which adults (a) gave you encouragement, (b) let you know you were loved, (c) made you feel appreciated, (d) told you that you did a good job, (e) made you feel special, and (f) spent free time with you. Three response options existed on the SSP (1 = *never,* 2 = *sometimes,* 3 = *often*). Each case received an individual score of caregiver support by summing adolescents' reports on the statements. The scale ranged from 6 to 18.

Demographic characteristics. I used four SSP items to measure youths' demographic characteristics, including gender, race, age, and socioeconomic status. Respondents' gender was dichotomous (0 = *male,* 1 = *female*). On the SSP, students indicated one of seven racial categories (Native American or Alaskan Native, Asian or Pacific Islander, African American, Latino, European American, multiracial, or other). I created three dichotomous variables to reflect whether an individual was African American, Latino, or other. European Americans served as the reference group.

As for the age variable, students selected one of 12 possible ages on the SSP (from age 9 and under to 20 years old and older). Due to the uneven distribution at the two ends of this variable, I recoded the variable into ten categories, thus changing the two ends of the variable to indicate students 11 years old and younger and 18 years old and older.

To capture adolescents' socioeconomic status, students' receipt of free or reduced-price lunch served as a proxy variable. Response options for this item on the SSP comprised a 3-point scale (1 = *no,* 2 = *yes,* 3 = *don't know*). I recoded the *don't know* responses as *no* and created a dichotomous variable indicating receipt of free or reduced-price lunch (0 = *no,* 1 = *yes*).

Missing Data

Researchers have found that missing data can create biased answers to research questions (McKnight, McKnight, Sidani, & Figueredo, 2007). Missing data may influence construct validity by hindering the ability of an item or a scale to measure constructs. It also can harm internal validity by producing results reflective of a smaller sample than was intended and may depict weaker associations among variables. Furthermore, because statistical power is calculated by using sample size, missing cases decrease a study's statistical power and may influence causal generalizations. For example, students who complete surveys may differ from students who fail to complete surveys, thereby hindering researchers' ability to generalize results.

Given the potential for erroneous results caused by missing data, I conducted missing data analysis for level-1 variables. I examined the number, mechanisms, and patterns of missing data to guide the selection of a remedy and followed the recommendations for missing data analysis as established by Acock (2005), McKnight et al. (2007), and Saunders et al. (2006).

Amount of Missing Data

Consistent with previous research, I assessed the amount of missing data by employing the complete case method (Little & Rubin, 2002; McKnight et al., 2007; Peugh & Enders, 2004). This approach sums the number of cases with missing data on at least one item. Specifically, I examined the number of cases with complete and missing data for seven variables (four dependent and three level-1 variables).

Mechanisms and Patterns of Missing Data

In addition to examining the number of cases with missing values, I examined the mechanisms (the why) and patterns (the how) of omission (Acock, 2005; McKnight et al., 2007; Saunders et al., 2006). Specifically, I assessed whether the data were missing completely at random (MCAR), missing at random (MAR), or missing not at random (MNAR) (Little & Rubin, 2002).

MCAR data comprise missing values that are randomly missing; that is, no observed pattern exists among cases with missing and available data (Little & Rubin, 2002). MCAR is rare in research (Acock, 2005; Peugh & Enders, 2004; Saunders et al., 2006). To test for MCAR, I subjected the four dependent variables and seven level-1 variables to Little's multivariate statistic (Little's MCAR test) in SPSS version 14.0. Little's MCAR test uses a chi-square statistic to test for group mean differences between cases with and without missing values for continuous items only (Little & Rubin, 2002; SPSS, 2007). A nonsignificant chi-square statistic suggests that data may be MCAR.

I also considered the possibility of data missing at random. In general, MAR data comprise missing values conditioned by covariates but not related to dependent variables (Acock, 2005; Little & Rubin, 2002; Saunders et al., 2006). MAR data are not missing randomly across the data set; rather, they are randomly missing within data set subgroups. MAR assumes omission occurs when another variable, such as low socioeconomic status, serves as a mechanism to explain why data are missing (Little & Rubin, 2002; McKnight et al., 2007).

Although researchers cannot truly test for MAR, because the data are missing, scholars can test for the possibility of MAR. Thus, consistent with previous studies, I tested

for the possibility of MAR by conducting a chi-square analysis among a dichotomous

variable that assessed whether a case had missing data (0 = *case present,* 1 = *case missing*)

and four demographic variables (gender, race, age, and socioeconomic status) (Acock, 2005;

Peugh & Enders, 2004; Saunders et al., 2006). A significant chi-square statistic suggests that

data may be MAR.

I also tested for the possibility of data missing not at random. In general, MNAR data

comprises missing values that are not randomly missing and that are associated with the

dependent variable (Little & Rubin, 2002). Although MNAR data is associated with both

independent and dependent variables, researchers are unable to truly model patterns of

omission because the data are missing. Given that researchers cannot directly test for MNAR,

Schafer (1997) presented guidelines for choosing between MAR and MNAR. Other studies

also have suggested recommendations for differentiating between MAR and MNAR (Schafer

& Graham, 2002). Thus, to determine whether data were MNAR, I followed the guidelines

set forth by these scholars.

Based on the analysis indicating that some data could be considered MAR, this study

required a remedy for missing data. Currently, scholars recommend two approaches to

remedy issues of MAR data: multiple imputation or data augmentation (McKnight et al.,

2007). Although either approach is usually acceptable, some scholars contend that multiple

imputation is better for binary dependent variables (McKnight et al., 2007; Schafer &

Graham, 2002). Thus, I employed multiple imputation.

I followed Rubin's (1987) rules to determine the number of data sets to generate.

Although scholars have debated how many data sets should be generated (Graham,

Olchowski, & Gilreath, 2007), researchers have widely accepted Rubin's (1987) rules. I

followed Barnard and Rubin's (1999) formula for determining degrees of freedom for small sample sizes.

In line with other studies, I created the data sets by using MICEwin software to formulate multivariate imputation by chained equations (Jacobusse, 2005; Schafer, 1997). Although it is not specifically designed to handle hierarchical data sets with binary dependent variables, several studies have employed this software because it uses Gibbs equations (Jacobusse, 2005).

Power Analysis

Using Optimal Design software (Raudenbush, Spybrook, & Liu, 2005), I conducted power analysis. This software computes the probably of success that a study has enough power to detect an effect.

The present study, with 93 communities and a harmonic mean of 18 students per community, has enough power (.80) to detect a effect size ($\delta \geq .25$), assuming $\alpha = .05$. Figure 4 depicts the results from the power analysis, where $\emptyset_E$ is effect size, $\emptyset_c$ is the ICC, j is the number of communities, and lower and upper plausible values are the 95% confidence intervals that the probability of a behavior problem lies between communities. Results are presented for two of the variables because drug use and smoking have similar values.

Analysis Procedures

To answer the posed research questions, I used hierarchical generalized linear modeling (HGLM), using HLM 6.04. HGLM is a statistical analysis that simultaneously models multiple levels of data. It enables researchers to model relationships within and between levels of data as well as to model cross-level interactions (Hofmann, 1997). For

Power

1 —

.5 —

.1 —

Power = .80

Drug Use, Smoking, and
Sexual Behavior
$\alpha = .05$
$\varnothing_E = .25$
$\varnothing_c = .11$
$n = 2$

Drinking
$\alpha = .05$
$\varnothing_E = .25$
$\varnothing_c = .15$
$n = 7$

1   50   93

Number of communities
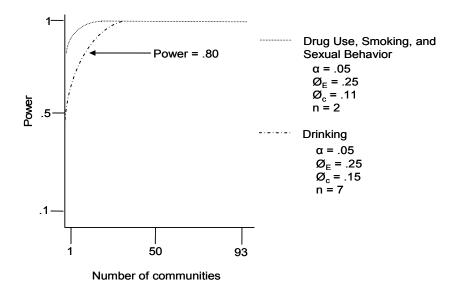
Figure 4. Power analysis

example, HGLM can examine the influence of individual-level and group-level community

capacity on the odds of behavior problems while also modeling joint effects.

There are several reasons I elected to use this approach. First and perhaps most

importantly, according to Guo (2005), hierarchical modeling addresses the substantive

hypothesis. Specifically, HGLM can examine the present study's cross-level hypothesis that

the influence of individual-level community capacity on behavior problems varies by the

level of community capacity in a community and that, all other things being equal,

adolescents who report low community capacity and who reside in communities with low

community capacity have the highest odds of behavior problems.

Second, HGLM allows for nested data structures, in which data drawn from the same

unit may share similar characteristics (Guo, 2005; Hofmann, 1997; Raudenbush & Bryk,

2002). Nested data structures violate the assumption of independent observation when

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employing ordinary least squares, thereby potentially including autocorrelated or intraclass-correlated data. Models failing to deal with nested data may reduce standard errors and yield spurious results (Guo, 2005). Because HGLM handles multiple levels of data simultaneously, it adjusts for this violated assumption (Raudenbush & Bryk, 2002).

Third, HGLM includes special models that address challenges associated with binary dependent variables, such as multilevel logistic regression (MLR) (Raudenbush & Bryk, 2002; Snijders & Bosker, 1999). Binary dependent variables may violate the assumptions of normality, linearity, and homoscedasticity presupposed by ordinary least squares or hierarchical linear modeling (HLM), a special case of HGLM (Long, 1997; Raudenbush & Bryk, 2002). Because binary dependent variables are restricted to one of two answers (traditionally, 0 = *failure,* 1 = *success*), outcomes have skewed distributions (Long, 1997; Raudenbush & Bryk, 2002). HGLM contends with this issue by specifying a sampling model such as a Bernoulli distribution (Raudenbush & Bryk, 2002). This distribution assumes variables have one of two outcomes (0 or 1) and calculates the probability p of success for the outcome.

Although calculating the probabilities of outcomes is useful, the results generally violate the assumption of linearity (Long, 1997; Raudenbush & Bryk, 2002), and assuming linearity with binary variables may produce results outside the probability range of 0 to 1 as well as yielding nonsensical results (Long, 1997; Snijders & Bosker, 1999). Subsequently, HGLM transforms these data using link functions such as logit to represent linear relationships. By applying the logit link function, researchers can estimate the odds of an outcome that ranges from zero to infinity (Snijders & Bosker, 1999).

Binary dependent variables also violate the assumption of homoscedasticity. For example, binary outcomes may assume a Bernoulli sampling model that presupposes a mean of the probability p and a variance of p $(1 - p)$ (Long, 1997; Snijders & Bosker, 1999). This equation shows that variance changes with the mean; thus, heterogeneous variance exists. Moreover, this equation implies that errors are heteroscedastic because they rely on the dependent variable (Snijders & Bosker, 1999). Applying ordinary least squares could produce bias standard errors (Guo, 2005), HGLM, on the other hand, allows for heterogeneous variance by including random effects (Raudenbush & Bryk, 2002). In addition, HGLM can use maximum likelihood algorithms such as the Laplace, which provides robust estimates for models with heterogeneous errors (Raudenbush, Yang, & Yosef, 2000).

Given this rationale for using HGLM, and the rate of missing data, I subjected five imputed data sets to a two-level multilevel logistic regression using HLM 6.04. This version of the HLM software was used because it can compute MLR estimates using multiple data sets.

First, I used MLR to assess the degree of between-communities variation in behavior problems. Scholars have used two approaches to test between-communities variance. Some researchers have recommended graphing the community probabilities as a function of community log-odds (Raudenbush & Bryk, 2002). Snijders and Bosker (1999), on the other hand, have suggested using a modified intraclass correlation coefficient (ICC) formula. Although Larsen and Merlo (2005) contended that ICC was uninformative in MLR, researchers consider the modified ICC computation acceptable (Snijders & Bosker, 1999). Thus, the present study applied the modified ICC formula.

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To determine between-communities variation in behavior problems, I ran an unconditional one-way ANOVA with random effects that assumed a Bernoulli sampling model and a logit link function. Specifically, I computed a level-1 model

$$\eta_{ij} = \beta_{0j}$$

and a level-2 model

$$\beta_{0j} = \gamma_{00} + \mu_{0j}, \; \mu_{0j} \sim N(0, \tau_{00}),$$

where η_{ij} is the log-odds of behavior problems for individual i in community j, β_{0j} is the average log-odds of behavior problems for community j, γ_{00} is the average log-odds of behavior problems for all communities, τ_{00} is the log-odds of between-communities variance in behavior problems, and μ_{0j} refers to a community with a random effect equal to 0 (Hofmann, 1997; Raudenbush & Bryk, 2002). I further computed a 95% confidence interval $[\gamma_{00} \pm 1.96 \; \sqrt{\tau_{00}}]$

Using results from the unconditional one-way ANOVA, I applied Snijders and Bosker's (1999) modified ICC formula, which specified $\rho_I = \tau_{00} / (\tau_{00} + \pi^2/3)$, where ρ_I is the ICC coefficient of a binary dependent variable, τ_{00} is the variance in community average log-odds of behavior problems, and $\pi^2/3$ represents the within-community variance (Long, 1997; Snijders & Bosker, 1999). Using the ICC formula and results from the one-way ANOVA, I computed the ICC coefficient for each dependent variable.

Second, I used MLR to determine level-1 random effects. Specifically, I ran two models for each level-1 variable, where both models had the same fixed effects structure but differed on the random effects structures. Using the deviance scores and the difference in degrees of freedom between models, I calculated chi-square statistics. I also used a Laplace approximation of the deviance tests because, unlike other estimation algorithms, studies have

shown that Laplace yields stable results for HGLM (Raudenbush et al., 2000). One challenge with Laplace, however, is convergence. Subsequently, I centered the variables around their grand mean, which adjusts for differences in units, because it aids with convergence (Raudenbush & Bryk, 2002; Snijders & Bosker, 1999). Additionally, because HLM 6.04 cannot compute Laplace deviance scores while using multiple data sets, I tested random effects for one imputed data set.

Third, after determining level-1 random effects, I ran three models, following a model-building approach. Model 1 included both level-1 variables (community capacity, caregiver support, community peer behavior problems, gender, race, age, and socioeconomic status) and level-2 variables (community socioeconomic status, ethnic heterogeneity, and residual mobility). Model 2 added group-level community capacity to Model 1. Model 3, the full condition model, added the community capacity interaction term to Model 2. I used deviance tests, estimated using the Laplace transformation, to assess model fit.

Fourth, I ran a full condition model for each dependent variable, using MLR, to answer the three research questions. In line with other MLR studies, I used a Bernoulli sampling distribution, a logit link function [$\eta_{ij} = \log$(probability of behavior problems / 1 - probability of behavior problems)], and a linear structural model that included level-1 and level-2 predictors and adjusted for a nested data structure (Raudenbush & Bryk, 2002; Raudenbush et al., 1992; Rumberger, 1995; Small, 2007). Specifically, I tested the following full model for each dependent variable:

$\eta_{ij} = \gamma_{00} + \gamma_{01}$ (community capacity) + γ_{02} (community socioeconomic status) + γ_{03}

(ethnic heterogeneity) + γ_{04} (residential mobility) + γ_{10} (gender) + γ_{20} (African

American) + γ_{30} (Latino) + γ_{40} (other) + γ_{50} (age) + γ_{60} (lunch) + γ_{70} (caregiver

support) + γ_{80} (community peer behavior problems) + γ_{90} (community capacity) + γ_{91}

(community capacity * community capacity) + μ_{0j},

where η_{ij} is the log-odds of behavior problems (drug use, drinking, smoking, and sexual

behaviors) for student i in community j; γ_{00} is the average log-odds of the behavior problem

across level-2 units; γ_{01}, γ_{02}, γ_{03}, and γ_{04} are community-level main effects; γ_{10}, γ_{20}, γ_{30}, γ_{40},

γ_{50}, γ_{60}, γ_{70}, and γ_{80} are average covariate effects (as regression slopes) across level 2; γ_{90} is

the average level-1 effect (as regression slopes) across level 2; γ_{91} is the cross-level

interaction; and μ_{0j} refers to level-2 random effects.

To assess model fit, I used deviance tests, which provide more stable results than

other tests of random effects in MLR (O'Connell & McCoach, 2008).

Outliers and Leverage

I examined level-1 and level-2 residuals for potential cases that were outliers or

leveraged the data. Using HLM 6.04, I generated two residual data sets. Next, using SPSS

14.0, I graphed histograms of the residuals by the probability of each behavior problem. I

examined level-1 residuals first because problems at this level could confound level-2 results

(Raudenbush & Bryk, 2002).

Chapter 4: Results

The gender distribution shows that approximately half of the sample was male (48.2%). The sample comprised 61.4% European Americans, 15.6% African Americans, 10.5% Latinos, and 12.6% other (Native American or Alaskan Native, Asian or Pacific Islander, multiracial, or other). With the exception of students 11 years old and younger and 18 years old and older, youths' ages were almost evenly distributed (Table 2). A little more than a quarter of the sample (27.6%) reported receiving free or reduced-price lunch at school—an indicator of low household income.

Table 2

Adolescent Age Distribution

	Sample size	
	n	%
Age		
11 years old or younger	161	7.6
12 years old	342	16.3
13 years old	335	16.0
14 years old	297	14.1
15 years old	268	12.8
16 years old	282	13.4
17 years old	301	14.3
18 years old or older	113	5.4

N = 2,099

Figure 5 depicts the distribution of the dependent variables based on the original data set that included missing data. The results show that, of the 2,099 adolescents in the sample, few reported drug use (9.1%, *n* = 186), drinking (13.3%, *n* = 275), smoking (13.5%, *n* = 272), or engaging in sexual behaviors (15.2%, *n* = 309). Because research often shows that few engage in severe behavior, the skew of the distribution is expected.
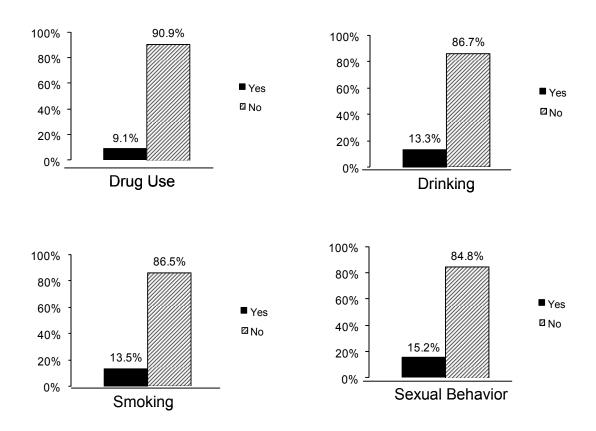

Figure 5. Percentage of sample reporting behavior problems

Missing Data

Missing data analysis showed that the National School Success Profile data set includes missing data. The data set comprises 1,818 cases with complete data and 281 cases

with at least one item missing information. Thus, 15.4% of the cases in the present sample are missing data. Further, 3.6% (n = 76) of the cases are missing a dependent variable.

Moreover, the missing data analysis supports the assumption that the NSSP has data missing at random, because cases missing data differ from cases with complete information. Little's MCAR test shows mean differences between cases with and cases without missing values on continuous scales [$\chi^2(27, N = 2,099) = 56.84$; p < .001]. Additionally, African American adolescents [$\chi^2(1, N = 2,095) = 7.23$; $p < .01$] and Latino [$\chi^2(1, N = 2,095) = 4.81$; $p < .05$] have significantly more missing data than other youths. These results support the possibility that MAR data exists in the present data set.

Additionally, publications that establish guidelines for distinguishing between MAR and MNAR support the assumption that the NSSP has MAR data. Schafer and Graham (2002) contended that there may be several reasons for missing data on survey items of a "personal or sensitive nature," beyond the dependent variable (p. 173). Hence, researchers using survey data such as the SSP may assume that MAR occurs. These authors also suggested that, after controlling for covariates, the missing data and an outcome probably correlates at less than .40. Thus, only minor bias may occur. Raudenbush and Bryk (1992) supported this claim.

Given the analysis results, I assumed that the NSSP has MAR data and instituted a missing data remedy. Consistent with previous research, I elected to use multiple imputations and computed five data sets, because a majority of the variables had minimal rates of missing data (McKnight et al., 2007; Saunders et al., 2006). As shown in Table 3, with the exception of caregiver support, the rate of omission for the variables was less than 3.6%, with most variables missing less than 1% of their data. These results support the use of five data sets

(Little & Rubin, 2002; Rubin, 1987). I deleted 76 cases because they were missing a dependent variable.

Table 3

Rate of Missing Data Expressed as a Percentage

Variables	Drugs	Drinking	Smoking	Sexual behavior
Community capacity	2.29	3.29	2.29	3.29
Gender	0.32	0.42	0.42	0.42
African American	0.10	0.12	0.13	0.19
Latino	0.07	0.12	0.10	0.12
Other	0.14	0.17	0.17	0.23
Age	2.29	2.29	2.29	3.29
Socioeconomic status	0.25	0.32	0.28	0.32
Community peer behavior problems	2.29	3.58	2.29	3.29

Hierarchical Generalized Linear Modeling

Between Communities

Table 4 shows the between-communities variation in behavior problems among adolescents. The item characteristic curves for drug use, drinking, smoking, and sexual behavior are .11, .15, .11, and .11, respectively. These results indicate that approximately 11% of variability in drugs use is between communities. Stated differently, the typical odds of drug use for a community with a random effect ($\mu_{0j} = 0$) is .11. Moreover, the probability score of 95% of communities lies between .08, and .12 with respect to drug use. Results for drinking, smoking, and sexual behavior are similar.

Level-1 Random Effects

Given that the deviance test chi-square statistics are nonsignificant, I set all level-1 variables as fixed. Thus, none of the level-1 variables varied across communities. Such fixed effects indicate that the estimates do not vary across communities (Hofmann, 1997). The level-1 coefficients were constrained to be the same for all communities, indicating that level-1 variables are similar in each community.

Table 4

Intraclass Correlation Coefficient Statistics

Variable	Average log-odds		ICC		Confidence interval	
	$\gamma 00$	$\tau 00$	#	%	probability	
Drug use	-2.31 (se = .10)	0.39	0.11	11	0.08	0.12
Drinking	-1.82 (se = .10)	0.56	0.15	15	0.13	0.20
Smoking	-1.85 (se = .09)	0.39	0.11	11	0.13	0.19
Sexual behaviors	-1.84 (se = .09)	0.40	0.11	11	0.16	0.22

Model Building

Table 5 presents the average deviance scores from the model-building analysis. Based on the average deviance scores, the results show no significant difference between models. In other words, adding community capacity at level 2 and as an interaction term failed to strengthen the models statistically.

Table 5

Average Deviance Scores From Model-Building Analysis

	Deviance scores			Significance	
	Model 1	Model 2	Model 3	Model 1 - Model 2	Model 2 - Model 3
Drug use	4791.39	4791.21	4791.15	0.67	0.81
Drinking	5127.22	5127.20	5125.94	0.89	0.26
Smoking	5153.39	5151.82	5151.15	0.21	0.41
Sexual behaviors	5323.82	5323.81	5323.40	0.92	52.00

Full Conditional Model

Table 6 presents the estimated HGLM coefficients and other statistics for the full condition model. None of the level-2 predictors is significantly associated with behavior problems in any of the four models. Thus, the findings fail to support the first hypothesis that group-level community capacity deters behavior problems. Second, after controlling for all other variables in the model, individual-level community capacity is not associated with any of the dependent variables. The findings also failed to support the second hypothesis, that individual-level community capacity deters behavior problems. Third, after controlling for all other variables in the model, the cross-level interaction was not significantly associated with behavior problems, thereby failing to support the joint-effect hypothesis.

Results show that females were less likely than males to engage in three of the behavior problems. For example, the risk (β) of drug use among females compared to the risk

Table 6

Community Capacity and Behavior Problems Among Adolescents

Parameters	Drug use		Drinking		Smoking		Sexual behaviors	
	β	exp(β)	β	exp(β)	β	exp(β)	β	exp(β)
Level-one								
Community capacity	-0.05	0.95	-0.05	0.95	-0.09	0.91	-0.10	0.90
	(0.06)		(0.05)		(0.06)		(0.05)	
Level-two								
Community capacity	-0.05	0.95	-0.07	0.93	0.24	1.27	0.02	1.02
	(0.31)		(0.29)		(0.27)		(0.27)	
Cross-level interaction								
Community capacity*community capacity	0.04	1.04	-0.10	0.90	-0.08	0.92	0.06	1.06
	(0.12)		(0.09)		(0.12)		(0.10)	
Level-one controls								
Caregiver support	-0.09	0.91	-0.09	0.91	-0.08	0.92	-0.06	0.94
	(0.02)**		(0.02)**		(0.02)**		(0.02)**	
Community peer behavior problems	0.33	1.39	0.30	1.35	0.29	1.34	0.21	1.23
	(0.06)**		(0.05)**		(0.06)**		(0.05)**	
Gender (female=1)	-0.79	0.45	-0.52	0.59	-0.31	0.73	-0.36	0.70
	(0.17)**		(0.14)**		(0.14)*		(0.14)*	
African American (=1)	-0.01	0.99	-0.18	0.84	-0.43	0.65	0.31	1.36
	(0.28)		(0.26)		(0.26)		(0.21)	
Latino (=1)	0.33	1.39	0.22	1.25	-0.18	0.84	0.30	1.35
	(0.33)		(0.26)		(0.29)		(0.25)	
Other (=1)	0.27	1.31	0.16	1.17	-0.15	0.86	0.14	1.15
	(0.25)		(0.22)		(0.23)		(0.20)	
Age	0.09	1.09	0.15	1.16	0.15	1.16	0.10	1.11
	(0.06)		(0.06)*		(0.05)*		(0.04)*	
Socioeconomic status (Poverty=1)	0.02	1.02	-0.32	0.73	0.10	1.11	0.17	1.19
	(0.18)		(0.16)		(0.17)		(0.16)	
Level-two controls								
Community socioeconomic status	-0.01	0.99	0.00	1.00	0.00	1.00	-0.00	1.00
	(0.01)		(0.00)		(0.00)		(0.00)	
Community ethnic heterogeneity	0.00	1.00	-0.01	0.99	-0.01	0.99	-0.01	0.99
	(0.00)		(0.01)		(0.01)		(0.00)	
Residential mobility	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
	(0.01)		(0.01)		(0.01)		(0.01)	
Fit Statistics								
Deviance scores	4791.15		5125.94		5151.15		5323.40	

* $p < 0.01$. ** $p < 0.001$. Values in parentheses represent standard error.

Note: HGLM model used population-specific estimates expressed as standardized factor change. Continuous variables grand mean centered.

of drug use among males is -0.79. Interpreting the risk of drug use using a β coefficient is challenging because the magnitude of the beta coefficient cannot be directly interpreted. Subsequently, researchers often compute and interpret odds ratios. Because these ratios are more meaningful, I discuss the study results in terms of odds ratios.

Table 6 presents odds ratios [exp (β)]. For example, the odds ratio of drug use is 0.45, which is less than 1, suggesting that females are less likely than males to use drugs, controlling for all other variables in the model. Scholars further convert odds ratios into percentages. In this study, for example, females are 55% less likely than males to use drugs (1 – 0.45 = 0.55). Therefore, after controlling for all other variables in the model, females on average are 41% less likely than males to drink, 27% less likely to smoke than males, and 30% less likely to engage in sexual behaviors.

Although it was not the central focus of the present study, the results show that three of the other level-1 control variables are associated with behavior problems. First, caregiver support is associated with each measure of behavior problems. Each unit increase in youths' report of caregiver support decreases the average odds of drug use by 9%, drinking by 9%, smoking by 8%, and sexual behavior by 6%, after controlling for all other variables in the model.

Second, the results show that community peer behavior problems are associated with individual behavior. Each unit increase in the community peer behavior problems score increases the average likelihood of drug use by 39%, drinking by 35%, smoking by 34%, and sexual behavior by 23%, holding all other predictors constant. These results suggest that for each standard deviation increase in community peer behavior problems, the likelihood that

youths will engage in one of the problem behaviors increases by approximately 20% to 40%, holding everything else in the model constant.

Third, adolescents' age is associated with three of the dependent variables. Every one-year increase in age, increases the average odds of adolescent drinking increases by 16%, smoking by 16%, and sexual behavior by 11%, after controlling for all other variables in the model. Drug use was not significantly associated with age. Thus, holding everything else constant, older adolescents have an increased likelihood of drinking, smoking, and sexual behaviors, but not of drug use.

Residuals and Outliers

At level 1, the results suggest that one adolescent may leverage the odds of both drug use and smoking whereas another youth may only leverage the odds of smoking. The results further suggest that no outlying cases exist. At the group level, one community may leverage the odds of all behavior problems downward. Additionally, one community appears to be an outlier for drinking. Nevertheless, the study includes all cases.

Summary

The results of this study failed to support the study hypotheses. Although it was not a focus of the present study, findings suggest an inverse association between caregiver support and all four measures of behavior problems. Community peer behavior problems, on the other hand, have a positive relationship with behavior problems. The results further indicate a link between gender and age and study outcomes; however, the study failed to find a connection with other demographic characteristics. The lack of association between race and behavior problems is surprising, because scholars often report a link between race and different types of behavior problems (CDC, 2006; FBI, 2007; NCES, 2005). Failing to find a

link between socioeconomic status and behavior problems is less surprising, because most

community studies have failed to find an association between individual-level socioeconomic

status and behavior problems once substantive explanatory variables are entered into the

equation (Wright et al., 1999).

Chapter 5: Discussion

The present study aimed to discretely and simultaneously examine the influence of individual-level and group-level community capacity on behavior problems among adolescents. Specifically, I hypothesized that group-level and individual-level community capacity has a direct effect on behavior problems. I also posited that the influence of individual-level community capacity on behavior problems varies by the level of community capacity in a community. Although the results neither proved nor disproved study hypotheses, this study contributes to research on community capacity and behavior problems in four ways.

First, this study specifically contributes to research that subscribes to a social organization perspective, because few, if any studies have concurrently explored multiple aspects of this framework. The present study focused on community capacity as well as offering a contextual effects conceptual model that allows for the examination of factors beyond adolescents' awareness (Blalock, 1984; Boss, 1993; Lewis & Smith, 1981). In addition, this study applied a contextual effects measurement approach and tested a cross-level interaction hypothesis.

Second, this study contributes to research on community by indicating that a compositional measurement approach may not help to explain between-communities variation in behavior problems. Studies examining the influence of community composition on behavior problems tend to report mixed results (Haynie et al., 2006; Leventhal & Brooks-Gunn, 2000; Simons et al., 2004). The present study detected no relationship between

community composition and behavior problems, thus lending support to the argument that community composition measures may not aid scholars in their understanding of behavior problems. These proxy variables may be inadequate measures of community characteristics, particularly community processes, in contextual effects studies. Moreover, the present study showed that between 11% and 15% of the variability in behavior problems is between communities, though I was unable to significantly explain this variability through measures of community composition, suggesting the existence of other unmeasured community factors.

Third, the present study highlights the need for researchers to include caregiver support and community peer behavior problems in conceptual models that explain behavior problems among adolescents. Previous research has shown that these constructs are associated with behavior problems among adolescents (Chung & Steinberg, 2006; Hoeve et al., 2009), and the present study supports this conclusion. The results regarding caregiver support are of particular importance because, although adolescents' social bonds expand to include adult and peer community members (Erikson, 1963, 1980), the current study found that, controlling for everything else in the model, caregiver support decreased the odds of behavior problems among adolescents.

Fourth, this study demonstrates the importance of exploring youths' demographic characteristics in community studies on behavior problems. Consistent with previous research, the present study showed that females on average are 55% less likely than males to use drugs, 41% less likely than males to drink, 27% less likely to smoke than males, and 30% less likely to engage in sexual behaviors (CDC, 2006; NCES, 2005). Moreover, because it examines behavior problems categorically, the study reveals the existence of links between specific demographic characteristics and particular behavior problems. For example,

consistent with previous research (NCES, 2005), this study found that older adolescents are more likely than younger adolescents to engage in drinking, smoking, and sexual behaviors.

Limitations

The findings from the present study must be interpreted with caution, due to study limitations. The present study is limited in that it tested fixed versus random effects for each covariate separately, as suggested by the empirical literature, rather than assessing for different structures of the random effects. Future research should test for different structures of random effects because hierarchical generalized linear modeling is particularly sensitive to these structures (Raudenbush & Bryk, 2002). Although the present study used prior research and statistical diagnostics to determine the structure of the random effects, the final model may have been misspecified because I set the covariates as fixed effects.

This study also is limited in that it established community boundaries by using the school zip code rather than youths' own specified community boundaries. This approach lends itself to two issues. First, adolescents may reside in one geographic unit but commute to a different geographic unit for school (Sampson, 2002). This study may have captured a variety of communities that crossed the school zip code boundaries and decreased the ability to determine an effect. To address this limitation, researchers should consider applying community member mapping (Coulton et al., 2001). This approach defines community boundaries by allowing members to indicate on a map of residential streets their perception of boundaries. In a pilot test of 140 community members in Cleveland, Ohio, Coulton et al. (2001) found that residents tended to indicate that their community was roughly the same size; however, they crossed multiple statistical boundaries. Although community member

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mapping provides an alternative to establishing geographically bound communities, this approach is expensive. As such, this method may create a complex, nonsustainable method.

The second limitation of using school zip codes rather than youth-specified boundaries is that adolescents may consider their community smaller than the school zip code (Coulton et al., 2001). For example, youths may perceive their community to exist within a few streets rather than within geographic boundaries established by the United States Postal Service (Blalock, 1984; Duncan, 1999). Subsequently, this study may have assessed a variety of communities within a single zip code area rather than one specific community suggesting that the study again may not accurately assess community differences.

Another limitation of this study lies in its use of survey data. This study used self-report data, which can result in error because individuals may over- or underreport behavior problems or may have difficulty recalling events (Carmines & Zeller, 1979). Despite these shortcomings, however, self-reported data may be more reliable than indirect assessments, because adolescents may not report all occurrences of behavior problems to adults (Connell & Farrington, 1997). The present study also is limited by its use of cross-sectional data. Cross-sectional data assesses an association between constructs at a specific time, whereas longitudinal data may clarify the temporal order of events and help assess causality.

An additional limitation to this study was the measure used to assess behavior problems among adolescents. Youths reported on disagreements with their parents in the past 30 days about their behavior and not about their specific involvement in behavior problems; therefore, the measure used in this study may better assess difficulties between caregivers and adolescents rather than represent youths' behavior problems. Future research should use direct measures of behavior problems.

Further, I recoded the measures of behavior problems into categorical variables. One category captured both youths' reporting *no* and *does not apply*. By collapsing these two responses into one variable I made the assumption that youths' reporting these responses are similar, however, the response *does not apply* may have multiple meanings. Perhaps some adolescents reporting *does not apply* do engage in behavior problems, however, their behavior does not create difficulties with adults in their home. In this event, the present study may under represent the occurrence of behavior problems, which then yields spurious results. Future research should consider applying models for multinomial data to handle such response options.

The present study also was limited by using a school-based sample, thereby omitting adolescents not enrolled in school (Henry, 1990). Perhaps community capacity is more important for youths not enrolled in school because they experience increased exposure to community capacity. Scholars, therefore, should maintain caution and not generalize these results to other adolescent populations.

Finally, although this study assessed the existence of outlying or leveraging cases, it failed to explore the influence of these cases on study outcomes. Specifically, the study could be strengthened by conducting follow-up analysis on the outlying and leveraging cases. At present, the study cannot determine the magnitude of influence these cases may have on study results.

Despite its limitations, this study has several strengths. Conceptually, it tested and measured a contextual effects model of community capacity. Methodologically, it used a contextual effects measurement approach, contended with missing data by using five

multiply imputed data sets, and employed a hierarchical generalized linear model to deal with nested data structures and binary outcome variables.

Implications for Social Work Practice

This study has implications for social work practice. First, the results suggest that interventions aimed at increasing community capacity may not be as effective in deterring behavior problems as programs focusing on increasing caregiver support and minimizing community peer behavior problems. Perhaps community capacity interventions should add caregiver and peer components. For example, the Comprehensive Community Initiative, which focuses on community capacity and uses holistic planning, could be expanded to encourage community member collaboration with adolescents' caregivers and community peers (Chaskin, 2001).

Second, the present study indicates that programs targeting community capacity should consider educating community members about the importance of caregivers and peers in youths' lives. For example, mentoring programs such as Big Brothers Big Sisters of America, which aim to foster relationships between adult community members and youths, could encourage mentors to also include caregivers and peers in some mentoring activities (Grossman & Tierney, 1998; Tierney, Grossman, & Resch, 2000), thereby strengthening relationships among mentor, mentee, caregivers, and peers.

Third, similar to the work of Mancini and Bowen (2009), the present study raises the issue of the degree of community capacity operating in a community. Perhaps community capacity exists within a community but fails to operate at an optimal level to influence youths' behavior. This idea suggests that social work interventions could assess the degree of community capacity and then focus on increasing it to better serve community residents. This

notion also indicates that perhaps a typology of community capacity exists and that, by identifying the different classes of community capacity operating within a community, practitioners may better match intervention efforts with adolescent needs.

Fourth, because the study found demographic differences in the likelihood of behavior problems, social work interventions should consider matching interventions to youths' needs. For example, the present study showed that males have higher odds of drug use than females, suggesting that males may benefit more than females from drug interventions. Similarly, this study showed that older adolescents are more likely than younger adolescents to engage in problem behaviors. Perhaps older youths would benefit from more intervention efforts.

Implications for Future Research

The present study also has implications for future research. Although social organization researchers contend that community capacity deters behavior problems, the present study found no support for this direct relationship (Mancini et al., 2003). Previous research, on the other hand, has showed a link between collective efficacy and behavior problems (Browning et al., 2008; Cantillon, 2006; Simons et al., 2004). Community capacity examines community member actions and collective efficacy assesses member sentiments (Mancini et al., 2003). Combining the present study with previous research suggests that only community member sentiments help deter behavior problems. Thus, scholars could argue for the elimination of community capacity from conceptual models. However, I caution against the removal of community capacity and recommend that researchers expand their conceptualization of community capacity to include both community member actions and sentiments.

By combining actions and sentiments, researchers may better understand the influence of community member effects on behavior problems among adolescents. Perhaps previous research has found that sentiments matter because youths engage in fewer problem behaviors when adults monitor youths' behavior and adolescents perceive that the adults care about the adolescent. I contend that scholars need to understand community members' actions and sentiments, and that exploring community capacity alone assesses only half of adult community members' influence on behavior problems among adolescents.

Additionally, I advocate extending community capacity conceptual models to include measures of caregiver support and community peer behavior problems. Assuming that scholars combine community capacity with collective efficacy, further research might examine whether caregiver support and community peer behavior problems influence the relationship between community capacity and behavior problems. For example, SSP-related research by G.L. Bowen, Bowen, and Cook (2000) reported a positive association between neighborhood collective efficacy as reported by adolescents living in single parent homes and their perceptions of supportive parenting. Other possible variables may also influence the relationship between community capability at both the individual and aggregate level and problem behavior, such as adolescent self-control (Crosswhite & Kerpelman, 2009).

I further suggest researchers examine the role of mediators in studies of behavior problems among adolescents, particularly caregiver support and community peer behavior problems. Perhaps the present study was unable to identify whether the influence of individual level community capacity on behavior problems among adolescents was moderated by community level community capacity because caregivers support and community peer behavior problems mediated this relationship. Future research should

examine whether these variables mediate this relationship. Testing the meditational role of

strong predictors of behavior problems will better researchers' understanding of direct and

indirect effects of community variables (Fraser, Richman, & Galinsky, 1999).

I also suggest that future research test whether the influence of community capacity

on behavior problems varies among different demographic groups. Although the present

study examined the influence of community capacity on behavior problems among

adolescents while controlling for gender, race, and socioeconomic status, it did not assess for

this relationship among different demographic groups. Further research could expand on the

present study by focusing on specific groups such as adolescent males to assess whether the

role of community capacity on behavior problems varies among these individuals.

Conclusion

Although the current study neither proved nor disproved study hypotheses, it

highlights the need for complex contextual effects models that explain behavior problems

among adolescents, particularly the role of mediators and moderators. The study showed that

assessing community members' actions alone may not help researchers understand the role of

adult community members in the lives of youths. Thus, future community research on

behavior problems should consider adult community members' actions and sentiments as

well as the degree of community capacity operating in a community.

Appendix: Measuring Community Controls

Using data from the 1990 Census, I subjected five variables to factor analysis (child poverty, public assistance usage, single parent families, other-than-English households, non-white community members). The measurement section of this paper presents information on the operationalization of these variables. Consistent with other community studies, I subjected five variables to factor analysis. The variables yielded an adequate Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (KMO = .78) and a significant Bartlett's test of sphericity ($p < .001$), which indicated ample correlation among variables. Additionally, the ratio of cases to variables was adequate for the sample with approximately 18 communities to every one variable (Castello & Osborne, 2005; Kline, 2005). Further, Spearman's diagnostic of multicollinearity indicates that minimal multicollinearity existed (*rho* $\leq$ .87) (Kline, 2005). Tolerance statistic (TOL) and variance inflation factor (VIF) also indicated minimal multicollinearity (TOL > .50, TOL < 2) (Kline, 2005).

Since two of the indicators showed some evidence of kurtosis (Aid to Families with Dependent Children $\beta2= 6.53$; non-white community members $\beta2= 6.63$), I used Principal Factor Analysis using SPSS version 14.0. Further, promax as the rotation method was employed because the variables were oblique, most variables were moderately correlated (>.78), with the exception of one correlation (.46). The results suggested two factors based on adequate eigenvalues (> 1.0), moderate communalities (> .74), and the scree plot (Costello & Osborne, 2005; Kline, 2005).

Table A presents factor loadings. As stated previously, principal Axis Factor Analysis showed three indicators loading on one factor (community socioeconomic status) and two indicators loading on another factor (community ethnic heterogeneity). Although some

scholars have contended that fewer than three indicators on a factor may yield unstable

results, other community studies have used a factor with two variables to assess ethnic

heterogeneity (Costello & Osborne, 2005; Sampson & Raudenbush, 1997; Kline, 2005). The

final result explained approximately 82% of the shared variance among variables. Consistent

with previous research, Factor 1 is labeled community socioeconomic status and Factor 2 is

labeled community ethnic heterogeneity (Stewart et al., 2002).

Table A

Community Structural Characteristics Factor Loadings

Variable	Factor loading
Community socioeconomic status	
Adolescent socioeconomic status	.99
Households with public assistance	.89
Single parent families	.85
Community ethnic heterogeneity	
Other-than-English spoken	.90
Non-white neighbors	.86

Principal axis factor analysis, with promax rotation.

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