Published in final edited form as:

J Adolesc Health. 2008 November ; 43(5): 482–489. doi:10.1016/j.jadohealth.2008.04.013.

Measuring Neighborhood Connection and the Association with Violence in Young Adolescents

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Abstract

Purpose—The objectives of this study were to construct measures of adolescent neighborhood connection and test the association of these measures with violence-related behaviors.

Methods—This study uses data from the baseline *Lead Peace-Plus* evaluation survey completed by 6th grade students (n=118). The survey was conducted in Fall, 2006 in four urban community schools with similar ethnically diverse and economically disadvantaged student bodies. The survey instrument, tailored for adolescents, included questions about violence involvement in the past year, as well as youth perceptions of and interactions with others in their neighborhood. Exploratory factor analysis was employed to construct neighborhood connectedness scales. Mixed-model logistic regression was used to examine relationships of these scales with students' violent behaviors, adjusting for age, gender and ethnicity.

Results—Exploratory factor analysis yielded two factors. The first factor, Intention to Contribute, was composed of five items ($\alpha = 0.86$) that indicated whether adolescents value and intend to work to improve their neighborhoods. The factor, Neighborhood Social Resources, was composed of eight items ($\alpha = 0.76$) that reflected adolescents' familiarity with neighbors and perceptions that their neighbors could provide support. Students with lower levels of both neighborhood connection measures were more likely to report violent behaviors in the past year. However, the trends were statistically significant only for relationships between Intention to Contribute and violence indicators.

Conclusions—Neighborhood connection can be measured with reliability in middle school students. Cultivating young adolescents' intentions to contribute to their neighborhoods may be an effective strategy for reducing youth violence.

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Keywords

violence; adolescent health; neighborhood cohesion; neighborhood connection

Introduction

There is increasing evidence that neighborhood cohesion plays a role in young people's health and development [1-6] and may be a critical determinant for economically disadvantaged youth [6-9]. Neighborhoods have a variety of collective qualities that can engage adolescents. However, levels of engagement may differ vastly between adolescents living in the same neighborhood. Furthermore, strong neighborhood connections may not necessarily lead to positive outcomes, if the collective neighborhood qualities that a young person or family taps into support anti-social, rather than pro-social norms [10].

Youth violence is a widespread problem with severe consequences. In 2004, an average of six youth aged 10-19 were murdered each day in the United States and in 2006 over 513,000 youth aged 10-19 ended up in emergency rooms to be treated for violence-related injuries, including self-harm [11]. There is sizable disparity in homicide rates between ethnic groups, for instance, African American male adolescent homicide rates are dramatically higher than those for European American males (33.5 vs. 12.1 per 100,000 in 2004) [11]. Excess violence exists in non-cohesive impoverished communities [12, 13]. Indeed, high levels of social disorganization, scarcity of economic opportunities, and low levels of citizen engagement are all known to be community-level risk factors for youth violence [14-16]. Additionally, since witnessing violence has been shown to be a risk factor for aggressive behavior in youth [17], neighborhoods with endemic violence may become vulnerable to developing a cycle of violence.

A neighborhood with high collective efficacy is one in which there are high levels of social cohesion and where neighbors are willing to intervene on the behalf of others in pro-social ways [18, 19]. In the Project on Human Development in Chicago Neighborhoods, Sampson and colleagues found that higher collective efficacy in neighborhoods was linked to less violence in neighborhoods [19]. Although Wright and Fitzpatrick found no connection between their measure of neighborhood connection and violent behavior; the measure of neighborhood connection that they used consisted of only three items that had poor reliability [20]. Still, it has been shown that adolescents' connections with school, parents, and other adults are negatively associated with violence involvement [21]. In a similar fashion, adolescents who feel strong connections to their neighborhoods and can benefit from the collective efficacy of their neighborhoods may be less likely to perpetrate violence.

Adolescents' connection to their neighborhood may be related to whether adolescents contribute to their community. The social development model and previous research suggest that adolescents are likely to develop strong social connections to their neighborhoods when they are provided with multiple opportunities for active involvement, possess skills for becoming involved in their neighborhoods, and experience positive reinforcements for neighborhood involvement [22, 23]. Kegler and colleagues found that psychological sense of community was related to community involvement in Native American adolescents [22].

This active, pro-social participation in their neighborhoods may in turn reduce violence perpetration among young people. However, individuals living in areas of concentrated poverty tend to have fewer sources of social support and their communities tend to be less cohesive [13, 24, 25]. The causes of non-cohesiveness in poorer communities likely lie upstream and relate to political and economic processes such as income inequality, class relations, and residential segregation [26-28].

The objectives of this study were to 1) construct multi-item measures of adolescent neighborhood connections, and 2) test associations of these measures with violent behaviors using data from 6th grade students involved in the *Lead Peace-Plus* evaluation study.

This study uses baseline data from the *Lead Peace-Plus* evaluation study. *Lead Peace* is a classroom-based service learning program for middle school students that aims to reduce violence by building core internal assets and external supports among young people who reside in challenging environments. The study schools are located in among the most socially and economically troubled neighborhoods in Minneapolis. While in Minneapolis, 12% of families with children under age 18 live below the poverty level; in neighborhoods of the study schools, between 30% and 42% of families with children under age 18 live in poverty [29]. In 2006, these neighborhoods had among the highest rates of homicide and assault in the city of Minneapolis [30]. The *Lead Peace* evaluation survey was intentionally tailored for young adolescents since the evaluation focuses exclusively on changes during the middle school years.

Methods

Study Design

This study used data from the baseline *Lead Peace-Plus* survey, conducted in Fall 2006 in 6th grades of four urban community K-8 schools. With consultation from the Minneapolis Public School District, four schools with similar ethnically diverse and economically disadvantaged student bodies were selected to be involved in the *Lead Peace-Plus* evaluation. All 6th graders in regular classrooms in these schools were eligible to participate in the research. Student self-report surveys were completed at the beginning of 6th grade, and will be administered again at the end of 6th, 7th, and 8th grades to permit comparisons of core health risk behaviors, risk and protective factors. This study reported in this article employs only data from the baseline survey, which was administered before *Lead Peace* intervention activities began. The survey, intentionally tailored for young adolescents, included questions designed to measure perceptions and interactions with others in their neighborhoods. Prior to fielding this survey, we conducted focus groups with parents and young adults who worked with middle school students and pilot tested the instrument with 6th grade students from another public school, to refine items in ways that would be clearly understandable and relevant to young adolescents.

Data Collection

Active consent for participation was obtained from parents/guardians. Youth whose parents gave consent for them to be in the study, had an opportunity to assent or refuse participation

on the day of the survey. From the 183 total students in the 6th grades of the 4 schools, 172 parents returned consent forms or were reached by phone. Of these, parents of 123 youth gave consent (67% of total student sample). The percent of parents giving permission is comparable to other school-based adolescent health studies that employ extensive parent follow-up methods [31]. Four youth did not give assent on the survey day and one was absent from school on both the survey day and the make-up survey day. Thus, our baseline sample size was 118.

The survey was administered in 6th grade classrooms. Students not taking the survey were given workbooks by research staff and were instructed to work quietly during the survey hour while the rest of the class took the survey. The survey instrument was written in English, however several accommodations were made to increase survey comprehension for subjects with lower reading levels or limited English proficiency. All survey questions were read out loud by research staff, research staff were available who could answer youths' questions in Spanish, and in the one school with a high percentage of Hmong-speaking students the survey was read out loud in both English and Hmong. Prior to administering the survey, research staff did an interactive demonstration with a sample question to show students how to interpret the response options for the neighborhood connection questions, noted below. All study procedures were approved by the both the University of Minnesota Institutional Review Board and the Minneapolis Public School District Research, Evaluation, and Assessment Committee.

Measures

Violence involvement was ascertained by four survey items that measured violent behaviors in the past year (Table 1). To make a distinction between students who did and did not report involvement in each violence indicator in the past year, we collapsed the response options "once" and "more than once" so that all of the violence outcome measures reported in this study are dichotomous. In addition, we created an "overall violence" measure which distinguished youth who reported involvement in any one of the four violence questions from those who did not. The Cronbach's α for the overall violence measure was 0.77.

Survey questions measuring neighborhood connection are listed in Table 2. These questions were adapted from the Chicago Youth Development Study community and neighborhood measures [32], The World Bank's social capital questionnaire[33], and neighborhood items from the National Longitudinal Study of Adolescent Health [20]. Each item had a 4-point Likert-style set of response options. These were "YES!" (coded as 4), indicating very strong agreement, "yes" (coded as 3) indicating agreement, "no" (coded as 2) indicating disagreement, and "NO!" (coded as 1) indicating very strong disagreement. Individuals' scores for each of the neighborhood connection scales were created by averaging responses to each item (each item in the scale was weighted equally). Student scores on each of the two neighborhood connection scales were classified as "high", "medium", and "low". "High" indicated that a student's average score on the items in the scale was 3 or higher (or "yes" or higher), "medium" indicated an average score between 2 and 3 (between "yes" and "no") and "low" indicated an average score of 2 or lower ("no" and lower). These categories

were chosen to separate youth who reported high, medium, and low levels of neighborhood connection.

Analysis

We used exploratory factor analysis (EFA) to explore underlying components of the neighborhood connections construct. We assessed eigenvalues, the scree plot, residuals, and proportion of variation explained in the EFA to determine the final number of scales, and items within scales. The initial EFA indicated that a two factor solution was reasonable and that the two factors would be highly correlated. Due to this correlation we employed an oblique rotation. Since an oblique rotation was used, we examined the factor pattern matrix of standardized regression coefficients for each item to assign items to factors. Finally, Cronbach's α was used to assess internal reliability in the resulting scales.

To test associations between neighborhood connection measures and students' self-reported violent behaviors, we used mixed-model logistic regression analyses to calculate predicted probabilities or prevalences. Schools are intact social groups, and behaviors of individuals within schools are assumed to be correlated since the students have common experiences and they interact. The mixed model employs a second component of variance in order to account for the clustering of individual students within schools [34]. The Intra-class Correlation Coefficient (ICC) for the schools reflects this clustering and has the correcting effect of adding an additional component of variance in the model. The ICC was estimated by running an intercept-only model using overall violence as the outcome and calculating the ratio between the variance attributed to school and the total variance. The ICC for the overall violence outcome in this sample was 0.365. In situations where the initial prevalence of the outcome behavior is relatively high, use of odds and odds ratios highly misleading [35]. Instead of odds ratios we have reported predicted probabilities or prevalences of the violent behaviors at high, medium, and low levels of the predictor scales and the associated 95% confidence intervals. We were unable to test for interactions between the neighborhood connection predictors and demographic factors likely due to the study's relatively small sample size.

Results

Table 1 displays demographics of the sample as well as distribution of students' responses to neighborhood connection predictors and the violence involvement outcomes. The majority of the students in the *Lead Peace-Plus* evaluation study identified as African American and sizable minorities identified as Asian and Latino. The sample was roughly equally split between the genders and most of the youth were 11 or 12 years of age, as would be expected at the beginning of the 6th grade year. Self-reported violence involvement was not uncommon with 58.6% of youth reporting being involved in at least one violent act in the past year.

In the EFA, two factors with distinct themes emerged (Table 2). The first, "Intention to Contribute", consisted of five items measuring intentions and values related to working to improve one's neighborhood ($\alpha = 0.86$). The second, "Neighborhood Social Resources", consisted of eight items measuring neighborhood familiarity and support from neighbors (α

= 0.76). The correlation between the final factors was $r = 0.6$ ($p < 0.001$). After factor themes were identified, three neighborhood items that did not seem to tap into the themes of youths' personal neighborhood resources or intentions but instead seemed to relate to youth's general assessment of the neighborhood (e.g. "People in my neighborhood are willing to help each other", "My neighborhood is safe") were excluded.

Figure 1 shows that compared to youth with lower levels, those with high levels of each neighborhood connection scale tended to report involvement in overall violence when adjusting for demographic characteristics. The p-value for the trend across the levels for the Intention to Contribute predictor and the overall violence outcome was significant at 0.01. While the p-value for the trend on the Neighborhood Social Resources predictor and overall violence outcome was not significant, those youth with high levels of Neighborhood Social Resources were significantly less likely to engage in overall violence than those with low levels of Neighborhood Social Resources. Table 3 shows adjusted predicted probabilities of the individual violence items at various levels of neighborhood connection. The Intention to Contribute predictor had statistically significant trends with all of the violence outcomes across levels while none of the trends with the Neighborhood Social Resources predictor and violence outcomes were significant. Since the overall violence measure distinguished youth who reported violence involvement in any of the four questions from those who did not, the adjusted predicted probabilities for overall violence, reported in Figure 1, are higher than those reported in Table 3 for each of the individual violence measures.

Discussion

Among our sample, young adolescents' intentions to contribute to their neighborhoods were linked to lower levels of violence involvement. Although associations between Neighborhood Social Resources and overall violence did not have a statistically significant trend, they were, generally, in the expected direction. A possible explanation for the lack of statistically significant associations between neighborhood social resources and violence involvement is that these connected youth were tapping into both pro-social and anti-social qualities of their neighborhoods, with anti-social connections reducing the protective effects of pro-social connections. Past research has found that connection to anti-social peers groups is associated with adolescents engaging in greater risk behavior [36, 37]. Neighborhood quality, which includes elements of collective efficacy, normative expectations for behavior, and safety is also critical for healthy youth development [38]. In this study we did not measure the collective efficacy of the youths' neighborhoods so we were unable to determine whether the neighborhood resources that youth rely on for support were predominantly pro-social or anti-social. Study findings lend support to one of the core premises of the *Lead Peace* program which is that building young peoples' motivation and skills for community involvement along with providing opportunities and support for pro-social neighborhood involvement may reduce their risk for violence involvement.

Study findings suggest that among young adolescents, neighborhood connection is measurable and its components are interrelated. As documented in this study, Neighborhood Social Resources was highly correlated with Intentions to Contribute. While this cross-sectional analysis cannot confirm order, young adolescents who have greater access to social

resources may develop stronger intentions to become involved in improving their neighborhood. In turn, a range of individual characteristics, social influences, and influences within the cultural environment may determine how connected young people are to their neighborhoods. Individual characteristics that influence neighborhood connection might include a young person's skills to engage with neighbors and become involved in neighborhood activities, as well as their past experiences with neighborhood involvement. Social influences might include modeling and support for pro-social neighborhood involvement by family, friends, and people at school. At the environmental level, neighborhoods have varying levels of opportunities for youth to connect. In neighborhoods blighted by concentrated poverty, there may be few opportunities for adolescents to participate in the community in positive ways. At the structural level, previous research suggests that the economic and political processes such as income inequality, class relations, and residential segregation are strongly related to lower levels of neighborhood connection and social cohesion [26-28]. Though not the focus of the *Lead Peace* intervention, structural level interventions are crucial to increasing social cohesion in economically disadvantaged communities.

Our estimates of youth violence are in the same range as those found in previous studies in similar populations. In the 2004 Minnesota Student Survey 40% of sixth grade boys and 22% of girls in the cities of Minneapolis and St. Paul reported that they "hit or beat up another person one or more times in the past 12 months" [39]. In the 2005 Youth Risk Behavior Surveillance study, 43.1% of African Americans, 41.0% of Hispanic and 33.1 % of White adolescents in grades 9-12 reported having been in a fight in the preceding 12 months [40]. These numbers are similar to the 42.6% percent of youth in our sample that reported "getting into a physical fight" in the past year.

This study has several limitations as well as strengths that we wish to highlight. Since the study is cross-sectional, we cannot assert that the associations reported are causal. Additionally, our small sample size is apparent in the wide confidence intervals and thus imprecise point estimates. It is possible that there were real effects of neighborhood social resources on violence outcomes that were too small to detect with the limited power inherent in the sample size. Our neighborhood connection measures have the disadvantage that they were not specifically tailored to the neighborhoods in which the participants live, for instance we did not ask about particular local programs or mentors for youth. However, an advantage of these measures is that they are likely to be useful with young people from a range of communities. A strength of this study is the performance of items measuring neighborhood connection intentionally tailored for young adolescents. Previous surveys

Future research should examine relationships between adolescents' neighborhood connections and other health risk behaviors as well as protective effects of neighborhood connections scales in larger, longitudinal samples. Additionally, the quality of the neighborhood social resources, and whether they are pro-social or anti-social in nature should be measured. The constructs and associations with violence described in this paper should be examined in other youth populations, to establish the validity of the neighborhood connections measure. Cultivating young adolescents' intentions to contribute to their neighborhoods may be an effective strategy for reducing youth violence. Future research

should evaluate the impacts of interventions and policies aimed at increasing young people's social resources and opportunities for pro-social community participation in reducing youth violence.

Acknowledgments

This research was supported by center funding for the Healthy Youth Development Prevention Research Center, cooperative agreement 1 U48 DP000063-02 from the Centers for Disease Control and Prevention and by a grant from the University of Minnesota Center for Urban and Regional Affairs. The authors would also like to thank Ms. Shari Plowman for coordination of data collection and Dr. Debbie Bernat for her collaboration designing the survey instrument.

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Figure 1.

Adjusted^{a,b} Predicted Probability (or prevalence) of Overall Violence for Each Neighborhood Connection Scale.

^a Logistic regression models adjusted for age (11, 12, 13), gender, and self-reported African American, Latino, Asian or Native American ethnicity. Due to small cell counts, White ethnicity was not included in the models as a covariate.

^b Logistic regression models employ a random effect for clustering within the four schools.

Table 1

Sample Descriptors.

			n*	%
Demographics	gender	male	55	47.0
		female	62	53.0
		total	117	
	age	11	64	54.7
		12	49	41.9
		13	4	3.4
		total	117	
	ethnicity ^a	Am. Indian or AK Native	10	8.6
		Asian	41	35.0
		Black or Afr. Am.	61	52.1
		Spanish/Hispanic/Latino	19	16.1
		White	6	5.1
Violence Measures	Overall violence ^b	one or more times	65	58.6
		none	46	41.4
		total	111	
	<i>In the past year, how often did you...</i> Use or threaten to use a weapon to get something from someone?	one or more times	35	30.4
		none	80	69.6
		total	115	
	Take part in a fight where a group of your friends was against another group?	one or more times	41	35.3
		none	75	64.7
		total	116	
	Hurt someone badly enough for them to need bandages or care from a doctor or nurse?	one or more times	33	28.7
		none	82	71.3
		total	115	
Neighborhood Connection Measures	Get into a physical fight?	one or more times	49	42.6
		none	66	57.4
		total	115	
	Intentions to Contribute	high ^c	39	33.6
		medium ^c	55	47.4
		low ^c	22	19.0
		total	116	
	Neighborhood Social Resources	high ^c	33	28.2
		medium ^c	51	43.6
		low ^c	33	28.2
		total	117	

^a Participants could select multiple categories for race/ethnicity.^b Indicates if participant reported any of the four violent behaviors that follow on the table.

^cResponse options for items were 1) YES!, 2) yes, 3) no, 4) NO!. High = averaging at least “yes” on scale items; medium = averaging between “yes” and “no”; low = averaging a “no” or less.

* Category totals are less than 118 due to participants skipping questions.

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Table 2

Neighborhood Connections Scale Items and Standardized Regression Coefficients from Exploratory Factor Analysis.

	All neighborhood items			Final items		
	Factor1	Factor2	α if deleted	Factor1	Factor2	α if deleted
I am interested in finding out about new things in my neighborhood	0.255	0.294	0.862	0.274	0.215	0.862
If I needed advice about something I could go to someone in my neighborhood	0.523	0.233	0.836	0.529	0.227	0.836
There are adults in my neighborhood I look up to	0.574	0.168	0.839	0.536	0.206	0.839
If I got in trouble I know someone who would help me out in my neighborhood	0.685	0.134	0.830	0.570	0.275	0.830
I know the names of a lot of people in my neighborhood	0.742	0.005	0.832	0.661	0.132	0.832
I know someone I could borrow money from (for bus fare or something else).	0.707	-0.315	0.859	0.693	-0.249	0.859
I regularly stop and talk with people in my neighborhood	0.607	0.144	0.834	0.717	0.006	0.834
I visit with neighbors in their homes	0.711	0.043	0.828	0.732	0.036	0.828
It is important to me to find a job that helps others	0.149	0.560	0.744	-0.056	0.769	0.697
It is important to me to volunteer my time to help people in need	0.097	0.562	0.750	-0.051	0.709	0.711
I feel I can make a difference in my neighborhood	0.051	0.526	0.750	-0.014	0.532	0.729
I plan to work to improve my neighborhood.	0.364	0.379	0.756	0.316	0.422	0.731
Working to improve my neighborhood is important	0.338	0.317	0.763	0.066	0.608	0.724
People in my neighborhood are willing to help each other	-0.033	0.686	0.753			
My neighborhood is safe	-0.186	0.674	0.770			
People should find time to help out in their neighborhood	0.046	0.330	0.786			

Table 3Adjusted Predicted Probabilities^a for Violent Behaviors^b at Low, Medium and High Levels of Neighborhood Connection^c.

Neighborhood Social Resources					
		Predicted Probability	95% CI	p for trend	
In the past year, how often did you...	Use or threaten to use a weapon to get something from someone?	Low	0.39	0.13 0.73	0.16
		medium	0.25	0.08 0.57	
		high	0.20	0.06 0.53	
	Take part in a fight where a group of your friends was against another group?	Low	0.28	0.12 0.52	0.78
		medium	0.32	0.17 0.53	
		high	0.32	0.15 0.55	
	Hurt someone badly enough for them to need bandages or care from a doctor or nurse?	Low	0.20	0.07 0.46	0.71
		medium	0.28	0.12 0.53	
		high	0.17	0.06 0.40	
	Get into a physical fight?	Low	0.38	0.17 0.64	0.57
		Medium	0.37	0.20 0.57	
		High	0.30	0.14 0.53	
Intentions to Contribute					
In the past year, how often did you...	Use or threaten to use a weapon to get something from someone?	low	0.61	0.24 0.89	0.05
		medium	0.17	0.04 0.48	
		high	0.24	0.06 0.60	
	Take part in a fight where a group of your friends was against another group?	low	0.43	0.20 0.70	0.03
		medium	0.38	0.21 0.59	
		high	0.15	0.06 0.34	
	Hurt someone badly enough for them to need bandages or care from a doctor or nurse?	low	0.41	0.41 0.72	0.01
		medium	0.26	0.26 0.50	
		high	0.09	0.09 0.26	
	Get into a physical fight?	low	0.62	0.30 0.86	0.03
		medium	0.42	0.23 0.63	
		high	0.16	0.06 0.36	

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Logistic regression models adjusted for age (11, 12, 13), gender, and self-reported African American, Latino, Asian or Native American ethnicity. Due to small cell counts, White ethnicity was not included in the models as a covariate.

Each violence measure is dichotomous to distinguish youth who reported no involvement in the behavior from those who reported some level of involvement in the behavior.

Logistic regression models employ a random effect for clustering within the four schools.