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Use of a Local Worker Survey as a Source of Neighborhood Information

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Abstract

Researchers increasingly recognize the potential influence of the neighborhood environment on individual health and social behavior. To examine these influences, it is important to use varying measures and sources of neighborhood characteristics. Though neighborhood residents are often surveyed, the perceptions of neighborhood workers have been largely ignored. The current study documents procedures and findings from two longitudinal studies in which workers in 60 neighborhoods were surveyed about neighborhood social cohesion and social control (collective efficacy), and neighborhood problems. Results indicated that workers within neighborhoods were more homogeneous in their views of neighborhood collective efficacy and neighborhood problems than were workers across neighborhoods. In addition, workers' perceptions of their neighborhoods were similar to the perceptions of neighborhood residents, but also provided unique information. Overall, this study demonstrates the viability and usefulness of local workers as an additional source of neighborhood information.

Keywords

Neighborhoods; Collective Efficacy; Measures; Multilevel Modeling

Researchers increasingly recognize the need for linking micro and macro level dimensions of social behavior. Neighborhood demographic and structural characteristics have been shown to exert both negative and positive influences on individual behavior, including problem behavior such as crime and delinquency (e.g., Ensminger, Lamkin, & Jacobson, 1996; Huber, 1990; Sampson, 1988; 1992), health and well-being (e.g., Malmström, Sundquist, & Johansson, 1999; Sampson, Raudenbush, & Earls, 1997), and physical activity (e.g., Duncan, S.C., Duncan, T.E., Strycker, & Chaumeton, 2002; Sallis, Johnson, Calfas, Caparosa, & Nichols, 1997; Sallis, Buono, Roby, Micale, & Nelson, 1993; King et al., 1995).

Neighborhood Collective Efficacy

Sampson et al. have postulated that structural or demographic characteristics of neighborhoods affect problem behaviors at least in part through the social mechanism of neighborhood collective efficacy (e.g., Sampson & Groves, 1989; Sampson, 1998). Sampson and colleagues (1998) describe neighborhood collective efficacy as the link between mutual trust and a shared willingness to intervene for the common good of the neighborhood, based on social control

and social cohesion. In this view, residents increase their ability to control the community when they form local social ties.

Neighborhood Problems

Research evidence also suggests that neighborhood structure can have health-promoting or health-degrading effects on residents. For example, the physical availability of alcohol appears to relate to use (Gruenewald, Millar, & Treno, 1993; Gruenewald, Treno, Taff, & Klitzner, 1997) and to arrests for alcohol-related problems and public drunkenness (Watts & Rabow, 1983). Neighborhoods with fewer problems (Sallis et al., 1993) may increase the probability of physical activity while neighborhood barriers may constrict activity (Sallis et al., 1997).

Sources of Neighborhood Level Data

The influence of neighborhood characteristics on individual health and social behavior may seem obvious, but it has not been widely studied, in part because of the historical lack of analytic techniques for handling multilevel data. Recent advances in multilevel modeling software designed to analyze nonindependent data, such as Mplus (Muthén & Muthén, 1998), have made it possible to conduct more methodologically sophisticated community studies to illuminate how the environment affects the individual. To inform these analyses, researchers in the past (e.g., Sampson, Raudenbush, & Earls, 1997; Diez-Roux et al., 1997; Cleveland, 2003; Caughy, O'Campo, & Patterson, 2001) have focused on neighborhood income, using archival data sources. Social, political, cultural, and institutional processes at the neighborhood level may be equally important, but are rarely measured (O'Campo, 2003), especially for studies of children (Coulton, Korbin, & Su, 1996). There are exceptions, including a study by Buka, Brennan, Rich-Edwards, Raudenbush, and Earls (2003) in which one set of respondents was surveyed regarding health outcomes and another set was surveyed about neighborhood characteristics. Similarly, van der Linden, Drukker, Gunther, Feron, and van Os (2003) administered one survey to measure social capital among neighborhood inhabitants unrelated to the children targeted in the study. These study designs reduce the risk of same-source bias (Duncan & Raudenbush, 1999). A review by Furstenberg and Hughes (1994) argued that studies should include direct measurement of neighborhood conditions, both from secondary data sources and from more ethnographic methods. Sole reliance on archival data sources may create an oversimplified picture (Caughy, O'Campo, & Brodsky, 1999). The collection of data from multiple sources can be costly, but necessary to achieve study goals (Gruenewald et al., 1997).

Where community studies have supplemented archival data, most have used direct observations/videotaping (e.g., Harwood et al., 2003; O'Neil, Parke, & McDowell, 2001; Coulton et al., 1996; Caughy, O'Campo, & Patterson, 2001; Sampson & Raudenbush, 1999), interviews (e.g., Russell, Cooper, Frone, & Peirce, 1999), surveys (e.g., Herrenjohl, Hawkins, Abbott, Guo, & Social Development Group, 2002; Ross, 2000; Caughy, Brodsky, O'Campo, & Aronson, 2001; Ross & Mirowsky, 2001; Ennett, Flewelling, Lindrooth, & Norton, 1997), or a combination of methods (e.g., Barber, Pearce, Chaudhury, & Gurung, 2001). Cheadle et al. (1998) went a step further and sought the opinions of community leaders and activists. While neighborhood *residents* are often surveyed to gather data about their environment, neighborhood *workers* have been largely overlooked. Workers are well-positioned to provide information, since they often spend 40 or more hours per week in the neighborhood, but a literature search covering the past 10 years did not identify a single ecological study in which neighborhood workers were systematically surveyed.

The purpose of the present study is to document the feasibility, validity, and reliability of a survey designed to gather neighborhood information from local workers. We hypothesized that

workers within neighborhoods would be more homogeneous in perceptions of neighborhood collective efficacy and problems than workers across neighborhoods, based on previous research (e.g., Sampson, Raudenbush, & Earls, 1997; Sampson et al., 1997). We further hypothesized that workers and residents would be somewhat homogeneous, but that each data source would provide unique information. Finally, we hypothesized that data collected from workers would be significantly associated with neighborhood socioeconomic indicators from Census data.

Method

Participants and Procedures

Data for this study were collected from 60 well-established neighborhoods in a Pacific Northwest metropolitan area for two longitudinal studies, one involving youth physical activity (Duncan, S.C., Strycker, Duncan, T.E., & Chaumeton, 2002a; Duncan, S.C., Duncan, T.E., Strycker, & Chaumeton, 2004) and the other focused on youth alcohol and other drug use (Duncan, S.C., Strycker, Duncan, T.E., He, & Stark, 2002b). Annual health surveys were administered over 4 years to female and male youth (9-, 11-, and 13-year-old cohorts in one study; 8-, 10-, and 14-year-old cohorts in the other) and parents/caregivers. Data from individual participants in both studies were merged for the present analyses (N=1,963 individuals in 2000; N=1,864 individuals in 2003).

Neighborhood data from secondary sources, including Census data, were collected for both studies. Additionally, surveys were administered to a random sample of workers in each neighborhood in 2000 and 2003 (N=60 neighborhoods in 2000; N=58 in 2003). Procedures outlined by Dillman (1978) were followed to increase participation.

Neighborhood Surveys were distributed to nonresidential addresses randomly selected from a telephone database. The surveys were distributed primarily by mail in 2000 and in person in 2003. In 2000, a total of 2,852 surveys were distributed, of which 530 surveys were returned, with returns ranging from 1 to 18 surveys per neighborhood. Because of low mail returns in 2000, surveys were hand-delivered in 2003. In 2003, a total of 1,230 surveys were distributed, of which 589 were returned, with returns ranging from 3 to 21 surveys per neighborhood. Costs, totaling \$1,431 in 2000 (about \$2.70 for each returned survey) and \$7,793 in 2003 (or about \$13 per returned survey) were split across the two studies.

Measures

Neighborhood social control, social cohesion, and problems—Data on perceived neighborhood social control, social cohesion, and problems were collected from both health survey participants and workers, using 5-point response scales and averaging across items. Social control was measured with a four-item scale (Sampson, 1998; Sampson et al., 1997). Respondents assessed the likelihood that people in the neighborhood would take action in four different situations (e.g., “Children were skipping school and hanging out on a street corner”). Reliability estimates for family members and workers were both $\alpha = .85$. Social cohesion was measured with a five-item scale (Sampson, 1998; Sampson et al., 1997). Respondents indicated the extent to which they agreed or disagreed with the listed statements (e.g., “People around here are willing to help their neighbors”). Reliabilities for family members and workers were $\alpha = .75$ and $\alpha = .81$, respectively. An index of neighborhood problems was created from 19 items, including gangs, graffiti, and noise. Reliabilities for family members and business respondents were both $\alpha = .94$.

Business respondent characteristics—Neighborhood Survey respondents were asked about type of business, ownership, their position at the business, business longevity in the community, neighborhood residence, and commuting time.

Census data—Census data from 2000 of neighborhood population density, percent White residents, percent households with children, median income, and median property value were used.

Analytic Method

Descriptive statistics—Descriptive statistics were computed of response rates, and social control, social cohesion, and neighborhood problems at both time points. Tests of group differences were conducted.

Multilevel modeling—The data structure suggested multilevel modeling. Hierarchical modeling, described in detail elsewhere (e.g., Goldstein, 1986), is appropriate for handling dependence of data collected in a clustered fashion (T. E. Duncan, S. C. Duncan, Strycker, Li, & Alpert, 1999). However, in this study, the worker and health survey participant datasets were differently structured, presenting a practical problem in specifying a single model. Health survey participants (parents and youth) were nested in families, which in turn were nested in neighborhoods. Workers were nested directly in neighborhoods. To compare workers with health survey participants, a series of models using Mplus software (Muthén & Muthén, 1998) was conducted.

Multilevel models of nested vs. averaged worker data—Worker data for the three neighborhood constructs were analyzed, separately in 2000 and 2003, in two-level random coefficients models clustered by neighborhood. The models yielded correlation coefficients for each neighborhood construct which compared values obtained from nested raw data with values obtained by averaging worker responses (between-level covariate) by neighborhood. The resulting high correlations (.937 for social control, .970 for social cohesion, and .947 for neighborhood problems in 2000), as well as similar means and variances, indicated that averaged worker data presented a reasonable proxy for clustered data in subsequent analyses.

Multilevel level models comparing workers with health survey participants—Separate three-level models were tested, for each time point and each of the three neighborhood constructs, correlating health survey participant data (individuals nested within families, nested within neighborhoods) with the worker data (the proxy version, aggregated to the neighborhood level). Since Mplus is limited to two levels, a three-level model for the health survey participant data was approximated by specifying neighborhood as the between level and dividing the within level into two levels consisting of a family factor on which individual respondent values were loaded. Two-level modeling in Mplus utilizing this strategy has been shown suitable for three-level data structures (e.g., T. E. Duncan, S. C. Duncan, Okut, Strycker, & Li, in press; T. E. Duncan et al., 1999; Muthén & Muthén, 1998). Thus, the three-level models partitioned neighborhood, family, and individual sources of variance for health survey participants, with the person-level data treated multivariately.

Intraclass correlation coefficients (ICCs)—Multilevel models were specified to estimate intraclass correlation coefficients (ICCs), in addition to other sample statistics, to quantify the degree to which workers and health survey participants had similar perceptions. Within the multilevel framework, ICCs represent the between- (neighborhood) to-total variance of a variable and are a measure of the dependency that exists among clusters (e.g., neighborhoods) of individuals. A value of 0 between-to-total variation suggests a lack of across-neighborhood variation (i.e., the neighborhood in which individuals work or live has

no influence on how they respond and there is no dependency among clusters of individuals), and such a finding indicates that a multilevel analysis is not needed, since the observations can be considered independent of one another and standard statistical procedures could be employed. However, if the between-to-total variation is statistically significant, ignoring the clustered nature of the data and the dependency among the observations would result in biased estimates, and lead to incorrect conclusions about the relationships at all levels of the hierarchy.

Models comparing worker perceptions and Census data—A model was specified to correlate averaged worker perceptions of their neighborhoods in 2000 with 2000 Census data. Like the averaged worker perceptions, the Census represents data aggregated to the neighborhood level.

Results

Return rates

As can be seen in Table 1, the overall return rate in 2000 was 18.6%. The overall return rate in 2003 was 47.9%.

Characteristics of neighborhood businesses and respondents

Table 2 summarizes worker and workplace characteristics from the 2000 and 2003 Neighborhood Survey. Reasonably diverse samples of business types and respondents were obtained. About a third of businesses in 2000 and about half of businesses in 2003 were classified as manufacturing or sales (e.g., restaurant, retail store) compared to all other types of business (e.g., professional office, school). Roughly half of respondents were business owners. Most businesses were locally owned and most had been in the community for 16 years or more. About a third of workers also lived in the neighborhood. Most respondents had a relatively short commute to their work places (e.g., less than 5 minutes; 5–10 minutes).

Neighborhood perceptions

As illustrated in Table 3, workers had similar perceptions about the neighborhood's collective efficacy and problems regardless of business ownership or their position at the business. However, workers in manufacturing/sales businesses tended to rate their neighborhoods as having less social control, less social cohesion, and more problems than workers in all other business types. Also, workers who resided in the neighborhood tended to perceive their neighborhoods more positively in 2003 than nonresident workers.

Workers compared to health survey participants

Table 4 presents descriptive statistics and ICCs summarizing results of the multilevel analyses comparing health survey participants and local workers. Because of multicollinearity issues, only three of the six three-level models could be specified to compare health survey participant data (nested within family, nested within neighborhood) with worker data (averaged to the neighborhood level) on the three neighborhood constructs. Family-member responses, which were treated multivariately, tended to correlate so highly that three of the models would not converge. However, three models were specified successfully, with good fit, one each for social control (using 2003 data; $\Pi^2(6) = 7.013$, $p = .3197$, Comparative Fit Index [CFI] = .976, Root Mean Square Error of Approximation [RMSEA] = .016), social cohesion (using 2000 data; $\Pi^2(6) = 8.816$, $p = .1842$, CFI = .990, RMSEA = .024), and neighborhood problems (using 2000 data; $\Pi^2(6) = 2.222$, $p = .8982$, CFI = 1.000, RMSEA = 0.000).

Perceptions of social control, social cohesion, and neighborhood problems were significantly correlated across the two data sources in the converged models with coefficients of .530, .522,

and .662, respectively. ICCs for the same measures also compared favorably across the two data sources (i.e., social control ICC = .081 for family data vs. .033 for worker data in 2003; social cohesion ICC = .195 for family data vs. .143 for worker data in 2000; neighborhood problems ICC = .181 for family data vs. .096 for worker data in 2000). These ICCs corresponded to significant variation at the neighborhood level in the worker data (ranging from .040, $t = 2.539$, $p < .05$ to .085 $t = 4.020$, $p < .001$).

Worker perceptions compared to Census data

Most of the neighborhood perceptions from workers in 2000 were significantly correlated with 2000 Census data, as summarized in Table 5. Especially strong was the pattern of correlations between perceptions of collective efficacy and neighborhood problems with Census-generated measures of percent White, median income, and median property value. In general, worker-reported perceptions of greater social capital and fewer neighborhood problems were associated with greater collective wealth and fewer non-White residents.

Discussion

Researchers have long recognized the importance of the environment in shaping health and social behavior. Yet measurement of the neighborhood context and how it affects the health and social behavior of individuals has been very limited (Coulton et al., 1996), with a few exceptions (e.g., Buka et al., 2003; Duncan et al., 2004; van der Linden et al., 2003). To thoroughly examine neighborhood influences, varying measures and sources of neighborhood characteristics are necessary (Gruenewald et al., 1997). Appropriately, neighborhood *residents* are most often surveyed to gather data about their collective neighborhood environment. Yet researchers have failed to tap the wisdom of neighborhood *workers*.

The goal of the present investigation was to describe the use of worker surveys as a means of gathering neighborhood data. Workers in local businesses were asked questions relating to neighborhood problems, neighborhood collective efficacy, and business and respondent characteristics. These neighborhood data were used as a source of information separate from health survey participants (neighborhood residents) and as a supplement to archival data sources.

Neighborhood Surveys were administered to a random sample in each neighborhood at two time points. We were concerned about the return rate in 2000 (18.6%), although this rate is fairly typical for mailed surveys (e.g., Berner, Bowers, & Heyman, 2002). Although there is no ideal response rate, a low return rate may indicate that all subsets of the population were not adequately represented, which would introduce bias and jeopardize generalizability (Berdie & Anderson, 1974). Our decision in 2003 to have surveys hand-delivered and returned by mail improved the return rate to a level similar to the return rates in other community studies (e.g., 48% in van der Linden et al., 2003; 40.2% in Morrison, Thomson, and Petticrew, 2003). For surveys in general, higher response rates are generally considered better than lower ones but there is no ideal response rate. Rather, return rates may be considered adequate as long as they result in unbiased, representative samples (Berner, Bowers & Heyman, 2002; Dillman, 1978). Our study findings indicate that diverse samples of business types and respondents were obtained despite quite different return rates and costs.

As hypothesized, the ICC coefficients (.045 to .239) corresponded to significant variation at the neighborhood level, indicating that workers within neighborhoods were more homogeneous in their perceptions than workers across neighborhoods. Although the size of the ICCs may appear low, they are substantial and meaningful for neighborhood-level variables because they correspond to significant variability in these variables at the neighborhood level. The significant ICCs in this study confirm that workers draw conclusions about the

neighborhoods in which they work, similar to others in the same neighborhoods and different from workers in other neighborhoods. Thus, it appears that both workers and residents tap into local social networks and are capable of assessing their quality. This study has established that workers and residents alike are good sources for measuring neighborhood social capital.

Significant differences were found in neighborhood perceptions by workers depending on the type of business and on whether the worker also resided in the neighborhood. Workers residing in the neighborhood tended to have more positive views than those who resided elsewhere. Workers in manufacturing/sales businesses tended to rate their neighborhoods as less socially cohesive and more problematic compared to other workers. It may be that manufacturing businesses are often located in industrial micro-neighborhoods geographically separated from other types of businesses and from residences, socially isolated and in more marginal environments. Despite statistical significance, the actual mean differences for these findings were small, thus limiting the practical, clinical, or community significance of these results.

Views of social control, social cohesion, and neighborhood problems correlated moderately across the two data sources, supporting the validity of the worker survey method. However, the moderate nature of the associations suggests that each data source also provides unique information.

As hypothesized, information collected from workers was significantly associated with selected neighborhood socioeconomic indicators from the Census, and these associations were in the expected direction. Workers apparently form impressions about the neighborhood environments in which they work, corresponding to existing, objective data sources.

Overall, the survey distribution was successful. Refusals were infrequent and rarely hostile. Certain types of businesses were more challenging than others. For example, churches and businesses run from residential addresses were more frequently unstaffed than retail businesses. Also, public schools tended to have policies preventing personnel from participating in research without written administrative approval.

There are strengths and limitations of this study.

One limitation of the analyses is that nested worker data and nested health survey participant data could not be incorporated within the same multilevel model because of different data structures. The use of Mplus software to conduct multilevel models, estimate ICCs and other sample statistics, and provide the necessary correlations is a strength, however. The models handled the clustered data structures appropriately, provided reliable estimates, and addressed the study hypotheses.

There are strengths to the survey approach and to the study. The Neighborhood Survey was simple and relatively inexpensive to administer. Return rates were reasonable. The extra cost of in-person delivery was deemed justifiable given the improved response. Another strength of this study is the ability to test the feasibility of the Neighborhood Survey within a relatively large number (N=58) of well-defined neighborhoods. Finally, the random selection of addresses provided a reasonable, generalizable data sample.

This study lays the groundwork for future research that uses diverse data sources to better understand the effects of the neighborhood environment on health and social outcomes. Building on the formative work of Dever (1991), a number of studies have shown that differences in the social quality of the local residential environment can affect personal health and well-being (e.g., Ellaway, Macintyre, & Kearns, 2001; Verropoulou, Joshi, & Wiggins, 2002; Twigg, Moon, & Jones, 2000). It is beyond the scope of the current study to examine how individual- and neighborhood-level differences in social cohesion, social control, and

neighborhood problems affect behavioral antecedents or outcomes. However, this study is part of a broader investigation in which longitudinal and hierarchical data will be utilized in such examinations. We encourage other researchers investigating contextual influences of human behavior to consider the use of local worker surveys as a source of neighborhood or community information and as a means to reduce same-source bias.

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Table 1

Neighborhood Survey Response Rates

	2000 - Mail Delivery (N=60 Neighborhoods)		2003 - In-Person Delivery (N=58 Neighborhoods)	
No. Surveys Delivered			1,230	2,852
No. Surveys Completed & Returned	530	589		
(Range per Neighborhood)				(1 – 18) (3 – 21)
Return Rate			18.6%	47.9%
(Range per Neighborhood)				(7% – 36%) (2% – 94%)

Table 2
 Characteristics of Neighborhood Business Respondents

	<u>2000</u> Mean (SD) or % (N=524)	<u>2003</u> Mean (SD) or % (N=578)
% Manufacturing/Sales		31%
% Owner as Respondent		51%
% Locally Owned		40%
		91%
		87%
<u>How Long in Community</u>	Not Collected in 2000	
	0–5 Years	20%
	6–10 Years	13%
	11–15 Years	12%
	16+ Years	55%
% Live in Neighborhood	Not Collected in 2000	
		36%
<u>Travel Time to Business</u>	Not Collected in 2000	
	10 Minutes or Less	40%
	11–20 Minutes	36%
	More than 20 Minutes	24%

Table 3
Neighborhood Scale Means By Business and Respondent Characteristics*

	Social Control		Social Cohesion		Neighborhood Problems	
	2000	2003	2000	2003	2000	2003
Business Type						
Manufacturing/Sales	3.4	3.3	3.1	3.0	3.2	3.2
All Other	3.5	3.4	3.1	3.1	3.0	3.0
Ownership						
Local	3.5	3.4	3.1	3.1	3.1	3.1
Not Local	3.3	3.2	3.0	3.0	3.2	3.2
Respondent Type						
Owner	3.6	3.4	3.1	3.1	2.9	3.0
All Other	3.4	3.3	3.1	3.0	3.2	3.1
Respondent Residency						
Resident	--	3.5	--	3.1	--	3.0
Nonresident	--	3.2	--	3.0	--	3.2

NOTE: The following comparisons were significant in *t*-tests ($p < .05$). Social Control: manufacturing/sales vs. all other in 2000, neighborhood residents vs. nonresidents in 2003, and owners vs. all other respondents in 2000. Social Cohesion: manufacturing/sales vs. all other in 2003. Neighborhood Problems: manufacturing/sales vs. all other respondents in 2000, and neighborhood residents vs. nonresidents in 2003.

Table 4
Comparisons of Health Survey Participants and Workers on Neighborhood Scales

	<u>2000</u>		<u>2003</u>
	Parent and Youth Health Surveys (N=524)	Neighborhood Worker Survey (N=1,963)	Parent and Youth Health Surveys (N=578)
			Neighborhood Worker Survey (N=1,864)
Social Control			
Mean (SE)	3.75 (.03)	3.43 (.06)	3.61 (.04)
Between-Level Variance	.025 ($t=2.09$)	--	.050 ($t=2.73$)
ICC	.045	--	.081
Social Cohesion			
Mean (SE)	3.57 (.04)	3.06 (.03)	3.51 (.05)
Between-Level Variance	.085 ($t=4.10$)	.079 ($t=4.02$)	.105 ($t=4.21$)
ICC	.195	.143	.239
Neighborhood Problems			
Mean (SE)	2.16 (.05)	3.12 (.05)	2.20 (.08)
Between-Level Variance	.090 ($t=4.03$)	.085 ($t=3.92$)	.245 ($t=3.29$)
ICC	.181	.096	.123

Note: Some results are missing because of model nonconvergence due to multicollinearity.

Table 5

Correlations between 2000 Worker Data and 2000 Census Data on Neighborhood Scales

	Social Control	Social Cohesion	Neighborhood Problems
Population Density	.024		.018
			.170
Percent White	.487***		.429**
			.633***
Percent Households With Children	.167		.07
			.4
			.298*
Median Income	.577***		.389**
			.610***
Median Property Value	.614***		.320*
			.530***

Note: Results marked with * are significant at $p < .05$, ** are significant at $p < .01$, and *** are significant at $p < .001$.