University of Alaska Anchorage
Justice Center

Working Papers

Collective Efficacy and Firearms Violence in Anchorage, Alaska: Preliminary Findings

by

Shel Llee Evans

and

Robert H. Langworthy

Justice Center
University of Alaska Anchorage

Paper presented at the 2007 annual meeting of the
Western Society of Criminology, Scottsdale, Arizona.

Working Paper Number 5

February 2007

http://justice.uaa.alaska.edu/workingpapers/
ISSN 1555-3445

Collective Efficacy and Firearms Violence in Anchorage Alaska:
Preliminary Findings

One of the most important essays in the past decade directed at improving our understanding of neighborhood effects on crime and violence is that written by Robert Sampson, Steven Raudenbush and Felton Earls appearing in a 1997 issue of *Science*. The paper was one of the many products of the Project on Human Development in Chicago Neighborhoods (PHDCN). What makes this essay profound is that it introduced a concept of 'neighborhood collective efficacy' to a wide audience, and related that concept to incidence of violence while controlling for neighborhood level effects of poverty, immigration, and residential stability. Their findings suggest that the effects of these historically important social composition correlates (poverty, immigration, and stability) are mediated by collective efficacy.

There were several things that made the paper important. First, though collective efficacy was not a new concept (see Taylor, 2002), it was new in name to the discipline. Second, their development of instruments, measures, and samples were theoretically informed, validated, well documented, and widely distributed. This allowed others in the research and scholarly communities to fully grasp their ideas and integrate them into the community of ideas while setting the stage for replication. Third, they shared their data with the research and scholarly communities. Finally, and perhaps most importantly their thesis offers an empirical test of a social explanation of the relation between community structure and violence.

The body of work examining the relation between structure, collective efficacy and crime has focused on alternative examinations of the PHDCN data by members of the research team (see for example Sampson and Raudenbush, 1999; Sampson, Morenoff

and Earls, 1999; Morenoff, Sampson and Raudenbush, 2001) and others using the PHDCN data (see for example, Browning, Feinberg and Dietz, 2004; and Browning, 2002). Not surprisingly these studies have leant credence to the primacy of collective efficacy in interpreting the relations between structural disadvantage and crime.

Others involved in the discussion have focused on individual level explanations of fear of crime using individual assessment of neighborhood collective efficacy (Xu, Fiedler, Flaming, 2005; Gibson, et al., 2002; Maxson, et al. 1999). Finally, one recent study sought to attribute resident action to either neighborhood context or individual characteristics (Wells, et al. , 2006).

To date the bulk of what we presume to know about the mediating effect of collective efficacy on neighborhood levels of known crime (versus perceptions of crime) is drawn from the PHDCN data. While the collective efficacy thesis is an elegant derivative of the rigorous analysis of the Chicago neighborhood data, it remains unclear whether this thesis will be supported in other settings.

This paper seeks to advance the discussion of the utility of collective efficacy, as captured by Sampson, Raudenbush and Earls, in understanding community levels of crime by exploring the relation between community structure, collective efficacy, and in this case firearms violence, in another locale—Anchorage, Alaska. The specific aims of this paper are to:

- Report on efforts to replicate the measures employed in the 1997 *Science* paper by Sampson, Raudenbush and Earls; and,
- Report the results of a test of the collective efficacy thesis, modeled loosely after the test presented in the 1997 Science paper by Sampson, Raudenbush and Earls, as an explanation of neighborhood rates of firearms violence in Anchorage.

Measures Replication and Data

The collective efficacy thesis suggests that neighborhood crime rates are the product of structural characteristics of neighborhoods mediated by neighborhood collective efficacy. The analysis requires construction of three types of measures: community structure, collective efficacy, and violence. These measures are addressed in some detail below.

Community Structural Measures. The community structure measures used in the original *Science* essay (Sampson, Raudenbush, Earls, 1999) were developed from an analysis of 1990 census data aggregated to neighborhood clusters (a combination of two or three census tracks per cluster). These measures were founded on theory and prior empirical research and were designed to capture aspects of community disadvantage. Sampson and his colleagues proceeded with a factor analysis of ten variables[1] isolating three factors they dubbed 'concentrated disadvantage,' 'immigrant concentration,' and 'residential mobility.'

The present study followed this lead with two exceptions. First, the measures developed for this study were based on 2000 census. Second, the measures were computed at the census tract level (N=55) rather than at a neighborhood cluster level (N=343). Results of the Chicago and Anchorage factor analyses are presented in the table 1 below.

[Table 1 here]

[1]The census derived variables were % of families below poverty, % of families on public assistance, % of families female headed, % 16 years and older unemployed, % of population less than 18 years, % of population Black, % of population Latino, % of population foreign-born, % of population over 5 year in the same house since 1985, and % of residences owner-occupied.

Review of table 1 suggests that the factor structure apparent in the 1990 Chicago census data was not reproduced in the analysis of the 2000 Anchorage data. The departures were several. First, the percent under 18 did not load with any of the other measures. Second, percent black did not load with the measures that constituted 'concentrated disadvantage' in Chicago. Third, the immigrant concentration factor did not emerge. Finally, the residential stability factor isolated for Anchorage included percent black. It is also apparent that, with the exception of percent under 18, all of the census variables loaded strongly on the first factor and that the remaining two factors were weakly identified as indicated by eigenvalues barely above 1.

With these considerations in mind a second factor analysis was done this time excluding percent under 18. The results of this analysis are presented at the right of table 1 under the Anchorage 2 Factor heading. Again, it is apparent that one factor is clearly identified (eigenvalue approaching 6) and the other weakly identified (eigenvalue just 1.14). Further it is apparent that percent black and the two residential stability measures that had previously loaded on factor 3 now load most strongly on the first factor. These findings suggest a single measure of community disadvantage in Anchorage well captures the content of the three measures of community structure isolated and used in Chicago—this factor is labeled *multiform disadvantage.* Multiform disadvantage is the first factor taken from the nine variable (percent less than 18 years was excluded) principle components factor solution.

Collective Efficacy. Collective efficacy, "…defined as social cohesion among neighbors combined with their willingness to intervene on behalf of the common good…" (Sampson, Raudenbush and Earls, 1997:918) was captured as a composite measure that combined ten Likert scaled items measuring informal social control (5

items) and social cohesion and trust (5 items). In Chicago the survey items were collected through in-person interviews as part of a 1995 community survey—these same survey items were asked as part of the 2005 Anchorage Community Survey, a telephone survey of nearly 2,500 households in Anchorage.

Comparison of the measures in Chicago and Anchorage was done in two stages and reveals nearly identical construction. First, measures of informal social control and social cohesion and trust in Anchorage census tracts were computed as they were reportedly computed in Chicago. Second, the measures of informal social control and social cohesion and trust were correlated at r=.84.[2] Following the Chicago procedure the five items that made up the informal social control measure were added to the five items that constituted the social cohesion and trust measure to form the summary measure, *collective efficacy.*

Violence. Measures of violence in Chicago were captured from two sources. First, respondents in in-person interviews were asked about recent violence in the neighborhood and about their personal victimization experience. The second source of data about violence was incidence of homicide (from records of the Chicago Police Department) aggregated to neighborhoods.

Neighborhood violence in Anchorage was measured using two types of data provided by the Anchorage Police Department: firearm incident reports and calls for service. The firearms incident reports are reports of offenses known to the police and were collected over the period between June 2003 and January 2005. These reports

[2] Before accepting the summation of informal social control and social cohesion and trust measures as a measure of collective efficacy the ten items that constitute the measure were examined by factor analysis to assure that measures of social control and cohesion were apparent. The ten items from both the Chicago community survey data (available from ICPSR) and the Anchorage Community Survey were subjected to factor analysis and indeed in both data sets two factors emerged with loadings that were consistent with the arguments made in the *Science* paper.

provide information about day, time, and nature of the incident as well as location. It was possible to geo-code and aggregate to census tracts 345 of the 350 incidents available for this analysis and compute census tract rates of firearms incidents per 1,000 population.[3]

Two other measures of violence were developed from APD calls for service data spanning the period between 2003 through 2005. The first, a violence rate per 1,000 population, was computed by summing the number calls for assaults, assaults with weapons, homicides, sexual assaults and robberies[4] across census tract and dividing by the resident population of the census tract (in thousands). The violence rate is dominated by assaults which constituted about 75 percent of the calls in this measure. The second measure of violence focus on weapons offenses. The weapons offense rate per 1,000 population was computed by summing the number of calls for assaults with weapons, disturbances with weapons, misconduct involving weapons, and robberies[4] across census tracts and dividing by the resident population of the census tract (in thousands). The weapons offense rate is dominated by misconduct involving weapons offenses which constituted slightly more than 60 percent of the calls that made this measure.

Two of the three types of measures (community disadvantage and violence) are not direct replicates of measures reported in the *Science* paper (collective efficacy is a replicate). That noted, multiform disadvantage captures the conceptual content of concentrated disadvantage, immigrant concentration, and residential stability.

The only substantial measurement departure is the measurement of violence. The Chicago study sought to explain violence as measured by perceptions of violence in

[3] It is apparent that the project did not gain access to all firearms incident reports reported to the police during the period between June 2003 and January 2005 (there were several untenable gaps in the dates of reports). That noted, it does not seem likely that the reports received misrepresent the neighborhood distribution of firearms incidents.

[4] Does not include strong-arm robberies.

respondent communities, by recollections of victimization experience, and by reported homicide levels. The Anchorage study seeks to explain violence rates as measured by known firearms incident rates, and rates of calls for service to weapons offenses and violent offenses. While these measures differ it seems likely that a robust explanation of violence would reasonably be tested using either set of measures.

Collective Efficacy and Violence in Anchorage

The collective efficacy thesis holds that neighborhood collective efficacy mediates the effects of social structure on violence. In essence the thesis argues that social structure produces collective efficacy which in turn impact crime. This is a particularly attractive theory because it suggests that the effects of structural properties of a community (which are notoriously intractable) on crime are substantially indirect through their relation to community empowerment (a seemingly more malleable property of communities). If collective efficacy is a proximate cause of violence or crime more generally, then it maybe that crime prevention efforts may be better focused on community building than on community structure.

The collective efficacy thesis found support in the PHDCN studies by introducing a collective efficacy term into multivariate models that related community structure variables (concentrated disadvantage, immigrant concentration, and residential mobility) to the incidence of violence. In all instances the collective efficacy term was statistically significant and substantially reduced the explanatory power of the structural variables.

The present study follows their lead though less elegantly.[5] Using the measures presented earlier in the paper, two models each to explain variation in neighborhood

[5] The analysis presented in the *Science* paper was a three level hierarchical linear model analysis that allowed response bias and neighborhood composition biases

firearms incident report rates, neighborhood weapons offense call rates, and neighborhood violent offense call rates are estimated using OLS regression. The first model relates multiform disadvantage (the Anchorage equivalent to the social composition variables presented in the *Science* paper) and the proportion of the population under 18 years (this variable was included in the concentrated disadvantage measure used in the *Science* paper but did not load with those variables in Anchorage) to our dependent variables. The second model adds collective efficacy to the multivariate explanation with the expectation that the collective efficacy term would be statistically significant and diminish the explanatory power of multiform disadvantage and proportion under 18 years.

Table 2 presents the results of this analysis in three panels: a) Neighborhood firearms incident rate; b) Neighborhood weapons offense call rate; and c) Neighborhood violent offense call rates. Review of the models makes it apparent that in none of the three trials were the effects of the social composition variables on firearms incident rate, the weapons offense call rates, or the violent offense call rates mediated by collective efficacy. Indeed, in no instance was collective efficacy found to be statistically significant nor was the explanatory power of the social composition variables significantly diminished.

[Table 2 here]

Discussion and Conclusions

Certainly the foregoing analysis does not support the neighborhood collective efficacy thesis as it has emerged from the Chicago project. There are a host of explanations for the departure of these findings from those in Chicago. The present study captured the collective efficacy measure using a telephone survey rather than in-person

interviews. That noted, comparison of the structure of the collective efficacy measures in Anchorage and Chicago reveal substantial similarity. When the ten survey items that constitute collective efficacy were subjected to factor analysis both data sets (Anchorage and Chicago) isolated two factors (informal social control and social cohesion and trust) composed of the same variables. When those two indices were correlated both correlated at greater than r=.80. The evidence suggests that the Anchorage and Chicago measures of collective efficacy were quite similar even if captured through a differed survey method.

It could also be argued that our measure of multiform disadvantage did not reasonably capture the three structural measures of social composition isolated in the Chicago study and that somehow accounts for the findings. This is plausible mostly as a function of aggregation. The unit of analysis in the Anchorage study was census tract, whereas the Chicago study took neighborhood cluster of two or three census tracts as the unit of analysis.[6] While aggregation bias is always a concern, it remains that the Anchorage measure of multiform disadvantage was composed of the same elements that constituted the three social composition measures used in the Chicago study suggesting that the measure's departure was more of form than substance.

Another methodological departure is the method of analysis. The Chicago study used a three level hierarchical linear model analysis while the Anchorage study relied on OLS regression. The nested analysis allows for statistical control of sample bias and

[6] In another analysis the factor structure derived from the ten census items that constitute the social composition variables was conducted at both a census tract and block group level. The block group analysis revealed a single factor while the census tract analysis isolated two or three factors depending on the inclusion of proportion under 18 years. This suggests an aggregation effect and lends credence to the argument that the factor structure emergent from the Anchorage census data differed because the unit of analysis was smaller.

within neighborhood reliability of the collective efficacy measure. That noted, this should impact only on the collective efficacy measure used in the study. Otherwise the study was based on valid and reliable neighborhood indicators of social structure (derived from census). Thus, the non-significance of collective efficacy as measured in Anchorage could be attributed to its not capturing the 'true' level of neighborhood cohesion, trust, and capacity for informal social control. This concern remains plausible and waits further testing.

It is also possible that the collective efficacy thesis does not generalize to Anchorage. This possibility emerges at two levels: a) measures of constructs may differ from place to place; and b) the thesis needs to be specified to account for place differences. Regarding varied measures of constructs it maybe, for example, that the social condition captured in Chicago and labeled immigrant concentration would be better measured in Anchorage with different variables. That is, the concern with ethnic diversity and its presumed impact on the capacity for a community consensus might well be measured in Chicago by a composite of percent foreign born and percent Latino but it is not well captured by those variables in Anchorage with its very different immigrant populations.

The second concern is most significant. If the measures capture the constructs important to the thesis, and if the form of the analysis produces robust results that are consistent with the theory some places and at odds in others, then it will be necessary to specify the thesis and to acknowledge that it is not generalizable. Indeed, it may well be that the collective efficacy thesis operates differently in older cities with established neighborhoods than in new cities with unstable, ill-defined neighborhoods. The challenge will be to better understand where it works and where it doesn't.

References:

Browning, Christopher R. (2002) The Span of Collective Efficacy: Extending Social Disorganization Theory to Partner Violence. *Journal of Marriage and the Family*, 64(4): 833-50.

Browning, Christopher R.; Seth L. Feinberg; Robert D. Dietz. (2004) The Paradox of Social Organization: Networks, Collective Efficacy, and Violent Crime in Urban Neighborhoods. *Social Forces*, 83(2): 503-34.

Gibson, Chris L.; Jihong Zhao; Nicholas P. Lovrich; Michael J. Gaffney. (2002) Social Integration, Individual Perceptions of Collective Efficacy, and Fear of Crime in Three Cities. *Justice Quarterly*, 19(3): 537-64.

Maxson, Cheryl; Karen Hennigan; David Sloan; Molly Raney. (1999) *The Community Component of Community Policing in Los Angeles: Final Report to the National Institute of Justice*. University of Southern California.

Morenoff, Jeffrey D. ; Robert J. Sampson; Stephen W. Raudenbush. (2001) Neighborhood Inequality, Collective Efficacy, and the Spatial Dynamics of Urban Violence. *Criminology*, 39(3): 517-59.

Sampson, Robert J.; Jeffrey D. Morenoff; Felton Earls. (1999) Beyond Social Capital: Spatial Dynamics of Collective Efficacy for Children. *American Sociological Review*, 64(5): 633-60.

Sampson, Robert J.; Stephen W. Raudenbush. (1999) Systematic Social Observation of Spaces: A New Look at Disorder in Urban Neighborhoods. *The American Journal of Sociology*, 105(3): 603-51.

Sampson, Robert J.; Stephen W. Raudenbush; Felton Earls. (1997) Neighborhoods and Violent Crime: A Multilevel Study of Collective Efficacy. *Science*, 277: 918-24.

Taylor, Ralph B. (2002) Fear of Crime, Social Ties, and Collective Efficacy: Maybe Masquerading Measurement, Maybe Déjà vu All Over Again. *Justice Quarterly*, 19(4): 773-92.

Wells, William; Joseph A. Schafer; Sean P. Varano; Timothy S. Bynum. (2006) Neighborhood Residents' Perceptions of Order: The Effects of Collective Efficacy on Response to Neighborhood Problems. *Crime and Delinquency*, 52(4): 523-50.

Xu, Yili; Mora L. Fiedler; Karl H. Flaming. (2005) Discovering the Impact of Community Policing: The Broken Windows Thesis, Collective Efficacy, and Citizens' Judgment. *Journal of Research in Crime and Delinquency*, 442(2): 147-86.

Table 1: Comparison of Chicago and Anchorage factor loadings related to specification of *concentrated disadvantage*, *immigrant concentration*, and *residential stability*

	Chicago Neighborhoods Clusters (N=344)			Anchorage Census Tracts (N=55)			Anchorage 2 Factor	
	Concentrated disadvantage	Immigrant. concentration	Residential stability	F1	F2	F3	F1	F2
Below poverty level	.93	--	--	**.883**	-.110	-.633	.872	.193
On public assistance	.94	--	--	**.853**	-.301	-.678	.893	.123
Female-headed families	.93	--	--	**.938**	-.221	-.485	.842	.404
Unemployed	.86	--	--	.562	-.666	-.511	.665	.035
Less than age 18	.94	--	--	-.134	**.947**	.025	----	----
Black	.60	--	--	.466	.100	**-.884**	.720	-.487
Latino	--	.88	--	**.820**	-.103	-.749	.891	.009
Foreign-born	--	.70	--	**.869**	-.276	-.287	.704	.544
Same house last 5 years	--		.77	-.465	.211	**.929**	-.772	.526
Owner-occupied house	--		.86	-.585	.414	**.855**	-.825	.334
Eigenvalues	>5			5.83	1.34	1.10	5.79	1.14

Note: Factor loadings for Chicago Neighborhood Clusters were presented in the *Science* paper (Sampson, Raudenbush and Earls, 1997:920).

Table 2. Neighborhood correlates of firearms incidents rate, weapons offense rate of calls for service and violence offence rate of calls for service, Anchorage, Alaska

Variable	Model 1: Social composition			Model 2: Social composition with collective efficacy		
	Coefficient	SE	t	Coefficient	SE	t
Neighborhood Firearms Incident Rate						
Intercept	**2.715**	.755	3.595	4.967	4.402	1.128
Multiform disadvantage	**.935**	.142	6.601	**.850**	.246	3.450
Proportion under 18 years	-4.644	2.636	-1.762	-3.765	2.816	-1.337
Collective efficacy	---	---	---	-.066	.116	-.565
R^2		.513			.526	
Neighborhood Weapons Offense Call Rate						
Intercept	**84.943**	12.338	6.885	62.257	73.566	.846
Multiform disadvantage	**15.521**	2.344	6.622	**16.913**	4.130	4.095
Proportion under 18 years	**-196.984**	43.279	-4.551	**-184.382**	46.004	-4.008
Collective efficacy	---	---	---	.525	1.937	.271
R^2		.598			.604	
Neighborhood Violent Offense Call Rate						
Intercept	**285.720**	43.900	6.508	138.229	264.694	.522
Multiform disadvantage	**34.183**	8.340	4.098	**40.869**	14.861	2.750
Proportion under 18 years	**-820.045**	153.999	-5.325	**-858.525**	165.527	-5.187
Collective efficacy	---	---	---	4.190	6.970	.601
R^2		.511			.518	