Published in final edited form as:

J Community Psychol. 2009 September ; 37(7): 795–808. doi:10.1002/jcop.20331.

Family and Community Influences on Educational Outcomes Among Appalachian Youth

Ryan Brown¹, William E. Copeland², E. Jane Costello², Alaattin Erkanli², and Carol M. Worthman³

¹Northwestern University, School of Education and Social Policy

²Duke University Medical Center

³Department of Anthropology, Emory University

Area Effects in Urban and Rural Environments

In the past two decades, fields ranging from demography to developmental psychology have increasingly focused on how quantifiable aspects of community context at the neighborhood or census tract level affect a range of behaviors, including violence (Khoury-Kassabri, Benbenishty, Astor, & Zeira, 2004; Sampson, Raudenbush, & Earls, 1997), parenting style (Gonzales, Cauce, Friedman, & Mason, 1996; Klebanov, Brooks-Gunn, & Duncan, 1994), and educational attainment (Boyle, Georgiades, Racine, & Mustard, 2007; Brooks-Gunn, Duncan, Klebanov, & Sealand, 1993). These studies have tended to focus on urban rather than rural areas. This urban focus is partially rooted in the way that “neighborhood effects” have traditionally been theorized. In *The Truly Disadvantaged*, William Julius Wilson described the concentrated poverty and limited opportunities in urban Black areas due to social processes leading to intensified zones of neighborhood deprivation such as “White flight,” gentrification, and housing discrimination have been most well documented in urban areas (Wilson, 1987).

Much ensuing research has assumed that area effects require the kind of urban, highly concentrated disadvantage described in Wilson’s work for the translation of structural limitations into individual behavior, as well as the “epidemic” transmission of behaviors across individuals (Crane, 1991; Jencks & Mayer, 1990). Furthermore, the notion of “neighborhood” as a critical component in area effects research tends to emphasize the intensive effects of local setting that one might assume are not as strong in areas with lower population density. A careful examination of the rural U.S. calls both of these reasons for assuming fundamental urban-rural differences in area effects into question. Local social stratification, labor exploitation, and rural gentrification also lead to pockets of intensive deprivation in the rural South (C. A. Duncan, 1996), and rural attachment to place tends to be significant (Tigges, 2006). In a study of rural educational aspirations, Howley (2006) found rural youth to be *more* attached to place than non-rural youth, and that this attachment had a significant limiting impact on postgraduate educational plans.

Furthermore, recent research has begun to consider influences that occur over longer distances and with less temporal regularity, such as the way that nearby neighborhoods (and associated social networks, resources, opportunities, etc.) condition the impact of more geographically immediate neighborhood context (Morenoff, Sampson, & Raudenbush, 2001). These developments also provide a justification for the study of area effects in rural environments.

If rural areas actually share many of the characteristics that “translate” community context to individual outcomes in urban areas, then one would expect that area effects in rural regions might operate in a similar way to area effects in urban locales. In support of this, Simons et al.

(Simons, Johson, Conger, & Lorenz, 1997) found that community disadvantage was linked to poor parenting in rural areas, and Pinderhughes et al. (Pinderhughes, Nix, Foster, & Jones, 2001) found that relationships between community disadvantage and parenting practices were not moderated by urban vs. rural residence. In a study of urban and rural contextual factors related to violent victimization, Gruenewald et al. (Gruenewald, Freisthler, Remer, LaScala, & Treno, 2006) found similar relationships between proximity to bars and violent incidents in urban minority and rural middle-income areas. Meanwhile, Boehmer et al. (Boehmer, Lovegreen, Haire-Joshu, & Brownson 2006) found that opportunities for physical activity and mobility restrictions due to fear of crime were related to obesity in rural areas, echoing similar findings in urban regions (McNeill, Kreuter, & Subramanian, 2006).

Despite differences in population density and other parameters, it appears that area effects, originally demonstrated in urban areas, may work similarly in rural areas on diverse outcomes and behaviors. To date, however, there are no published studies of area effects on education in rural areas. In this study, we examine the impact of area effects and childhood family environment in determining educational goals and attainment patterns among a sample of rural youth.

Ecological Influences on Educational Goals and Attainment

Most research on contextual or community effects on educational outcomes has focused on educational attainment rather than goal-setting (see Ceballo, McLoyd, & Toyokawa, 2004; Plunkett, Abarca-Mortensen, Behnke, & Sands, 2007 for recent exceptions). While certainly related to each other, goal-setting and attainment are far from identical; a large empirical and theoretical literature documents the linkages and disjunctures between the two (Grant & Dweck, 2003; Wigfield & Eccles, 2000). Attainment is a marker of long-term effort and success, and requires more personal perseverance and ecological scaffolding than goal-setting. However, prioritizing educational goals and maintaining achievement motivation are critical components of educational attainment (and may be especially important where ecological scaffolding is relatively weak).

Thus, we argue that studying family and neighborhood effects on both educational goals and patterns of attainment simultaneously is important for understanding the complex ecological influences on variation in educational outcomes. While both area and family effects on educational attainment have been well demonstrated and replicated (Boyle et al., 2007; Brooks-Gunn et al., 1993; G. J. Duncan, 1994; Garner & Raudenbush, 1991; Gonzales et al., 1996), we know of only two studies documenting area effects on education goals or priorities, both of which were conducted in urban regions. Among urban Latino high school students, Plunkett et al (2007) found a direct effect of neighborhood factors on educational aspirations, and a mediated (by perceptions of neighborhood) effect on grades. Among urban African Americans adolescents, Ceballo et al. (2004) found that percent of middle class neighbors was related to stronger value placed on education among females (but not males), and that educational values were significantly related to school effort.

Here, we present analyses of community (census tract) poverty and average educational attainment as they are related to educational goals and attainment patterns among a population of 200 White youth (19–24 years) living in the Appalachian mountains of western North Carolina. These youth have been studied longitudinally, which allows us to compare area effects with family poverty and parental education. We make use of a novel ethnographically-based instrument to assess life course goals and attainment among this age set and population, the Life Trajectory Inventory for Youth, or LTI-Y (Brown, Worthman, Costello, & Erkanli, 2006). Using the LTI-Y carries the added advantage of being able to investigate educational priorities and goal-setting as well as outcomes.

Methods

Sample

The participants in this study are part of a longitudinal study of families and health, the Great Smoky Mountain Study or GSMS (Costello et al., 1996). This study reports on a sample of 200 White GSMS participants (98 male, 102 female) who completed the Life Trajectory Interview for Youth (LTI-Y) when they were between 19–24 years of age (Brown et al., 2006). Although the GSMS sample includes both American Indian and White participants, the analyses presented here concern only White youth. American Indian participants live in a small and relatively homogeneous area comprised of very few census tracts. Cherokee participants mostly attend a single high school, and face different incentives than Whites for attending college (the Tribe will pay for any college to which an enrolled Tribal member gains admission). Finally, very few American Indians elect to live outside the reservation, leaving no room for an even partially exogenous impact of community context. Including the American Indian population would thereby violate one of the underlying assumptions of area effects analysis (Oakes, 2004). For these reasons, only White participants are included in the following analyses.

The LTI-Y sample was drawn to create an even distribution of exposure to family poverty. Additional information about the sampling strategy can be found in Brown et al. (2006). The LTI-Y collects extensive information during the transition to adulthood concerning major life course goals, hopes, expectations, and attainment patterns, and taps locally salient and age appropriate aspects of life course achievement for youth in Appalachia. All youth participated voluntarily and underwent informed consent procedures approved by the Emory University Institutional Review Board.

Family Context

Each year between the ages of 9–16, parental figures of GSMS participants reported household economic circumstances (income, assets, total number of dependents, etc.), allowing the calculation of whether each household was subsisting above or below the Federal Poverty Line. We used the percent of years below the poverty line during the ages of 9–16 to assess overall exposure to family poverty. For comparative purposes (to model the potential impact of household economic advantage as well as disadvantage), analyses were also run with household income, which was calculated as the average household income for participants across all waves of assessment. Parental figures (who often changed from year to year) also reported their highest grade completed, and we assessed exposure to parental education as the percent of waves in which participants lives with a parental figure holding at least a two year (Associate's degree or higher) college degree.

Community Context

The sample covers 12 counties and 72 census tracts, and is overwhelmingly rural; inclusive of several small towns and one small city, the average population density is 38 persons per square mile. Community context was assessed through matching participants' geo-coded residential addresses from the most recent available interview (usually at age 18 or 21) with census tract data from the 2000 U.S. Census. Census tracts contained an average of approximately three participants. We assessed community poverty as the percentage of all individuals living below the poverty line and community education as the percentage of all individuals with a 2-year (Associates) degree or higher.

For comparative purposes, analyses were also run with community high income households (to model the impact of community advantage rather than disadvantage). For exposure to high income by census tract, Krieger et al. (2006) recommend using 400% of the U.S. median

household income. However, such households are very rare in the GSMS study area (non-existent in several census tracts). Thus, we defined exposure to high income at the community level as the percent of households in each census tract with incomes greater than \$75,000 (approximately 180% of the U.S. median income in 1999).

Educational Goal-setting and Attainment

Educational attainment was assessed through response to three questions administered during the LTI-Y. These questions assessed whether participants (1) currently held a high school degree or GED, (2) had completed any post-secondary training (with or without a degree), or (3) had received a college degree (either Associates or Bachelor's degree). This yielded four possible outcomes for educational attainment: none, high school, some college, and college degree.

Educational goal-setting was assessed through a card sort procedure during the LTI-Y which assesses priorities and goals in the lives of Appalachian youth. A score of 1 was assigned if these participants included "Get college, technical, or vocational degree" in a set of their personal "most essential" life events (and a score of 0 if this card was not included). College goal-setting was only coded and analyzed for participants who did not already report having a college degree. Notably, part-time and other non-traditional college tracks are very common in this region of the country. For example, when participants were asked to suggest an ideal age for completing college, the mean response was 23 and the interquartile range was 21–25 (25% of the sample indicated an age above 25 as the ideal age for completing a college degree). Thus, asking 19–24 year old adults about their college aspirations in this sample is quite relevant, despite the fact that they might be considered to have "missed the boat" for a "traditional" 4-year college track.

Analytic Strategy

Due to sparse data and collinearity at the census tract level (Rehkopf, 2007), we were unable to use hierarchical linear modeling (Raudenbush & Bryk, 2001) with this data set. To examine the impact of family and community context on educational attainment (a 4-point scale), we used ordered logit regression in Stata 9.2 (StataCorp, 2005), with robust standard errors adjusted for clustered data at the census tract level. To examine the impact of family and community context on college goal-setting (a dichotomous outcome), we used logistic regression. Models predicting college goal-setting were run only with the participants who had not yet attained a college degree. As the sample includes participants between the ages of 19–23, we included age as a covariate in all models to control for the potential effects of age-based censoring on educational outcomes. As GSMS participants were originally oversampled for behavioral risk, all models were run with sampling weights to approximate the local population (Costello et al., 1996). In all models, we also standardized community and family contextual variables (mean of 0, standard deviation of 1).

For both educational attainment and college goal-setting, we first ran models with the community (census tract) variables, and then with both the community and family variables together. Census tract poverty and education level are essentially *aggregate* measures - they are characteristics of the same population from which our sample was drawn - which means that family and community context will inherently covary (Krieger et al., 2006). We interpreted census tract level indicators that remained significant after the addition of comparable family indicators as evidence of the additional role of community context (beyond that shared with family context) in influencing educational goals and outcomes.

Due to previous findings of gender-specificity in neighborhood effects (Ceballo et al., 2004; G. J. Duncan, 1994; Leventhal & Brooks-Gunn, 2000), all analyses were run once for the entire

sample, and then separately by gender. In the case of any gender differences in the significance level of predictors, full models were run with gender as a covariate and the relevant difference tested as an interaction term. For comparative purposes, analyses were first run using family and community poverty, then using family income and community high income households (family/community poverty and income can not be run in the same models due to high collinearity).

Results

Descriptive Statistics

Out of 200 participants, 20 reported having attained less than a high school degree or GED, 69 reported a high school degree or GED only, 70 reported some college education (with no degree), and 41 reported having attained at least a 2-year college degree. The 41 reporting already having attained a college degree were therefore excluded from analyses predicting college goal-setting. These 41 individuals did not differ from the rest of the sample by community (census tract) characteristics or gender; however, they did report more years of exposure to parental figures with a 2-year degree or higher (79% vs. 57%, $p < .05$). Of the remaining 159 participants, 76 (48%) indicated that getting a college degree was one of their most essential life goals.

Table I displays weighted averages of family poverty and parental education for the sample, neither of which differed significantly by gender. Relatively high exposure to parental education reflects both the local popularity of 2-year community college degrees and the fact that family composition changed fairly frequently in this sample. Specifically, 38% of this sample experienced one or more changes in family (parental) composition during the ages of 9–16, increasing the chances of one or more years of exposure to a parental figure with a 2-year or higher college degree. Table I displays number of participants per census tract and other census tract characteristics used to code community context variables.

Table II presents the pairwise correlations among the family and community predictor variables (corrected for multiple comparisons). As can be seen, there was statistically significant intercorrelation within and across family and community levels at the $p < .05$ level, but none high enough to present a risk of collinearity in regression models.

All models were run with age as a covariate, to help correct for the censoring problem posed by including participants with differential opportunities for exposure to education (spanning the ages of 19–23). Age was unrelated to any of the family or community predictor variables (pairwise correlations ranged from $-.15$ to $.08$, $p > .1$).

Educational Attainment

For educational attainment (assessed on a 4-point scale), initial models including only community (census tract) variables indicated that participants living in census tracts with higher average educational attainment showed higher personal attainment (see Table III, Model 1). This effect became non-significant ($p > .1$) when family poverty and parental education were entered into the model. Family-level variables had statistically significant effects in the expected direction; participants with more exposure to family poverty reported less educational attainment, while those who had lived with a college-educated parent reported higher attainment during emerging adulthood. The model with both area and family variables explained 9% of the variance in educational attainment for Appalachian youth (see Table III, Model 2).

Stratified results by sex (see Table III) were quite similar, with the exception that family poverty was more strongly associated with female educational attainment, while parental education

was more strongly related to male education attainment. However, in separate models (not shown), interactions between sex and family poverty / parental education were non-significant.

Results were very similar in analyses substituting average household income and community high income households for family poverty and community poverty (not shown). In these models, directions of influence and patterns of variable significance were identical, and r^2 did not differ by more than 2% in any model.

College Goal-setting

With respect to college goal-setting, participants living in census tracts with higher proportions of college-educated adults were more likely to endorse getting a college degree as an important life goal (see Table IV, Model 1). This area-level relationship remained statistically significant after exposure to family poverty and parental education level were entered into the model (see Table IV, Model 2). When these family level variables were entered into the model, exposure to parental education was also a significant predictor of college goal-setting: participants who spent more time with a parental figure holding at least a 2-year college degree were more likely to endorse getting a college degree as an important life goal. The full model including both area and family variables explained 15% of the variance in college goal-setting. As with educational attainment, results of models substituting average household income and community high income households for family poverty and community poverty (not shown) were almost identical. Directions of influence were identical, patterns of variable significance were nearly identical, and r^2 did not differ by more than 1% in full models (sex-specific models with income variables explained 4–5% more variance in college goal-setting).

The pattern of results for males and females was similar, but both family and community-level predictors explained considerably more variance in college goal-setting among males (29%) than among females (9%). Separate analyses for males and females (see Table IV) indicated that community educational level had a much stronger association with college goal-setting among males. Therefore, we tested the interaction between gender and community education. A model including only community variables yielded an interaction ($p = .06$) between gender and community education, which explained 13% of the variance in college goal-setting across the entire sample.

Discussion

While past studies have tended to focus on intensified deprivation and social transmission in more densely populated urban areas, this study demonstrates that community context (over and above the direct family environment) might exert an influence over the educational trajectories of rural youth as well. The observation of area effects on educational goals among rural youth is pertinent to the way that we theorize “exogenous” influences on life trajectories in environments with lower population density.

Previous studies have shown that area effects are generally weaker than the effects of family influence (Leventhal & Brooks-Gunn, 2000). Indeed, this seems to be the case in our sample for educational attainment during the transition to adulthood: family poverty and parental education during childhood influenced patterns of attainment several years later, while community context did not. Completion of educational milestones requires considerable resources, persistence, and social support, and these must be provided on a regular and consistent basis. Our analyses suggest that, in Appalachia, families (rather than communities) may be the primary pathway for the provision of these resources, scaffolding, and support. Indeed, this is supported by ethnographic interviews conducted during this study. For example, two 17-year old males who were living in one of the most rural counties commented (names have been changed):

Thomas: I know a lot of students that are able to go to college because, like, they get scholarships or something like that. And that's the only reason they can go to college. But a lot of people that might even be able to go to college...have to take care of our parents or help our parents, or we don't have the money, or our parents don't have money to send us to college. They can't afford for us to leave, for having us - helping trying to support things around here.

Tony: I mean, our parents are no better off than we are. If we want something, they don't have the money to buy it, because they're just as much in debt as we are. So I mean, we have to work for stuff! ... If I go off to college though, and I am in college full time, there's no way I can work. So who's going to pay for my truck? Who's going to pay for all my bills that I have? My parents don't have extra money to pay. They have extra bills and stuff.

While family environment is certainly important in rural areas, a close examination of economic deprivation and labor exploitation in rural areas (C. A. Duncan, 1996), as well as rural senses of place and identity (Howley, 2006) also indicates that one might expect community context to matter for rural populations. Such is the case for college goal-setting among this population of Appalachian youth, who are at a critical point in the transition to adulthood. Youth who had not yet attained a college degree and were living in census tracts with higher proportions of adults holding college degrees were more likely to endorse obtaining a college degree as an important life goal. The fact that individuals living in census tracts with low educational attainment also had lower educational goals makes sense in light of the significant attachment to place noted among rural youth. Specifically, labor market opportunities in such census tracts likely demand lower levels of educational attainment; if youth desire local employment and residence, aiming for a college degree might make little sense in light of these goals.

This community influence was particularly strong among rural males; of the males living in the quartile of census tracts with the lowest levels of adult educational attainment (10–19% holding a college degree), only 16% endorsed getting a college degree as an important life goal. Contrast this with males living in the quartile of census tracts with the highest adult college attainment (37–67%), of whom a full 44% endorsed college as an essential goal. In this case, rural males appear to be quite attendant to patterns of achievement in the general population, perhaps absorbing cues about life course opportunities and constraints from the extra-familial environment in ways that affect females somewhat less strongly. It is important to note that several existing studies find stronger community effects for educational outcomes on males (Leventhal & Brooks-Gunn, 2000). The persisting labor market disparities in favor of males in Appalachia (Thorn, Tickamyer, & Thorne, 2004) might accentuate such tendencies for environmental cues about educational attainment to translate more readily to male than female goals.

Unlike several existing studies in urban areas, we did not find an effect of community context on patterns of educational attainment. As this is a relatively small sample, it is difficult to know whether the absence of an effect is due to the fact that our sample did not have enough power to detect such effects, which are generally fairly small (Leventhal & Brooks-Gunn, 2000). As significant community effects were detected for educational goals, we believe that it is unlikely that non-detection resulted from a limited sample size, as that would mean that community effects on attainment are more modest than those on goals - a finding that to our knowledge has not been reported. If this pattern of community effects on educational goals but not attainment is replicated in other rural studies, it could make more sense to focus on families as sites for educational capacity building, rather than efforts to change school or community practices regarding education. However, replications in other rural areas are certainly needed before recommending this course of action.

Limitations

Hierarchical linear modeling (HLM) has become the standard method for estimating area effects on a wide variety of outcomes, from education (Bryk & Raudenbush, 1988) to violent crime (Sampson et al., 1997). However, sparse data (i.e., 1–2 observations) in one or more census tracts can yield a matrix of data where the level of collinearity among the variables in our sample leads to HLM models that will not converge, as well as parameters that are difficult to interpret (D. Rehkopf, personal communication, September 12, 2007). Thus, we presented the results of standard regression models, with robust standard errors adjusted for clustering at the census tract level.

Due to high levels of parental marital instability, we were unable to create a meaningful single variable to capture the impact of living with two parental figures with college degrees (rather than “one or more”); this may have underestimated the impact of parental education levels.

Studies of area effects have been critiqued for not properly considering the role of residential selection and endogeneity in explaining associations between outcomes and aggregate community properties (Oakes, 2004). Propensity score matching to control for relationships between demographic characteristics of individuals and their probability of living in a given area helps ameliorate such concerns (Diez-Roux, 2004). This approach - applied to relationships of neighborhood poverty with high school dropout - suggests a robustness impact of area effects on educational outcomes (Harding, 2003). Considering levels of residential mobility also yields important information regarding endogeneity and selection. In our sample, only 8.6% of GSMS participants move from one county to another during childhood and adolescence (ages 9–16). Additionally, the sort of residential selection patterns that can occur in urban areas to produce spurious “reverse causal” relationships – e.g., a young man “marrying up” and moving ten blocks to a neighborhood with a clearly different social class – are less likely to occur in rural areas. One must travel longer to experience a markedly different context, and families are often tied to the land through multigenerational histories of residence. Examining variability in area parameters across individual-level exposures also helps ameliorate concerns about the theoretical “exchangeability” of one area for another (Diez-Roux, 2004). In this sample, area and family exposures are correlated at quite low levels, and distributions of area exposures are very similar across levels of individual variables.

One of the weaknesses of studies on area effects is that they are primarily descriptive, with a minority of studies assessing potential process-related mediators (Sampson, Morenoff, & Gannon-Rowley, 2002). We believe that studying area effects on goal-setting or priorities (as we did in this paper) are a step towards a potential solution for this quandary in causal inference. When analysis detects area effects on the preferences of individuals, this suggests the degree to which community context can influence the cognitive and emotional processes of residents on an everyday basis.

Finally, this study was conducted in Appalachia, a region of the U.S. with a specific cultural and economic history. Thus, findings may or may not necessarily generalize to youth in other rural regions within the U.S. Nevertheless, our findings of a strong relationship between area-level educational attainment and college goal-setting among Appalachian youths does indicate that area effects can be detected in rural regions, and deserve further consideration and study.

Conclusions

In the wake of global urbanization, youth from rural areas face increasing risks of social estrangement and marginalization. Moreover, rural areas show patterns of economic exploitation and intensified deprivation that are both as entrenched and severe as more well-studied urban areas (Thorn et al., 2004). While unique in some respects, rural U.S. youth face

some of the same pressures from changing opportunities as youth across the globe (Mains, 2007). With the disappearance of more traditional labor opportunities in rural areas, it is increasingly important that rural youth find both the motivation and support to pursue alternate pathways, including those afforded by higher education.

This study used a novel, card sort-based instrument to assess life course goals and attainment among Appalachian youth, the LTI-Y (Brown et al., 2006) in combination with longitudinal data regarding the family circumstances of participants and geocoded residential data to determine community context. This represents the first published study to examine both area and family influences on educational outcomes in a rural population, and one of only a few studies (Ceballo et al., 2004; Plunkett et al., 2007) examining area influences on educational goals. Studies of area effects that involve samples with family environments that have been assessed longitudinally (such as this sample) help to parse the effects of aggregated community context from direct family exposure. Our results indicate that, while rural youth may be heavily enabled and constrained by family circumstances, community context also influences the educational hopes and aspirations of youth living in some rural areas. We suggest that future research explore further the impact of community context on youth in rural areas, particularly given the considerable psychosocial risks faced by rural youth (Costello, Keeler, & Angold, 2001; Osgood & Chambers, 2000; Smith & Ramana, 1998).

Acknowledgments

Brown thanks the Robert Wood Johnson Foundation Health & Society Scholars program for its financial support. Research was also supported by the W.T. Grant Foundation (DS804 383-2854) and the National Institutes of Mental Health (NIMH NRSA 5 F31 MH064253-02; NIMH R01 MH63970). Particular thanks to field interviewer Gabe Cyr and to the field staff of GSMS (Lisa Crisp, Wanda Burns, Rebecca Woodard, Shelda Calhoun, Shawn Barger, and Ellen Pfirrmann). We thank Irene Yen, David Rehkopf, Jenna Nobles, Belinda Needham, and Kaja Finkler for reading and commenting on an earlier draft.

References

- Boehmer TK, Lovegreen SL, Haire-Joshu D, Brownson RC. What constitutes an obesogenic environment in rural communities? *American Journal of Health Promotion* 2006;20(6):411–421. [PubMed: 16871821]
- Boyle MH, Georgiades K, Racine Y, Mustard C. Neighborhood and family influences on educational attainment: Results from the Ontario Child Health Study follow-up 2001. *Child Development* 2007;78(1):168–189. [PubMed: 17328699]
- Brooks-Gunn J, Duncan GJ, Klebanov PK, Sealander N. Do neighborhoods influence child and adolescent development? *American Journal of Sociology* 1993;99(2):353–395.
- Brown RA, Worthman CM, Costello EJ, Erkanli A. The Life Trajectory Interview for Youth (LTI-Y): Method development and psychometric properties of an instrument to assess life-course models and achievement. *International Journal of Methods in Psychiatric Research* 2006;15(4):192–206. [PubMed: 17266015]
- Bryk AS, Raudenbush SW. Toward a more appropriate conceptualization of research on school effects: A three-level hierarchical linear model. *American Journal of Education* 1988;97(1):65–108.
- Ceballo R, McLoyd VC, Toyokawa T. The influence of neighborhood quality on adolescents' educational values and school effort. *Journal of Adolescent Research* 2004;19(6):716–739.
- Costello EJ, Angold A, Burns BJ, Stangl DK, Tweed DL, Erkanli A, et al. The Great Smoky Mountains Study of youth: Goals, design, methods, and the prevalence of DSM-III-R disorders. *Archives of General Psychiatry* 1996;53(12):1129–1136. [PubMed: 8956679]
- Costello EJ, Keeler GP, Angold A. Poverty, race/ethnicity, and psychiatric disorder: A study of rural children. *American Journal of Public Health* 2001;91(9):1494–1498. [PubMed: 11527787]
- Crane J. The epidemic theory of ghettos and neighborhood effects on dropping out and teenage childbearing. *The American Journal of Sociology* 1991;96(5):1226–1259.

- Diez-Roux AV. Estimating neighborhood health effects: causal inference in a complex world. *Social Science & Medicine* 2004;58:1953–1960. [PubMed: 15020010]
- Duncan CA. Understanding Persistent Poverty: Social Class Context in Rural Communities. *Rural Sociology* 1996;61(1):103–124.
- Duncan GJ. Families and neighbors as sources of disadvantage in the schooling decisions of White and Black adolescents. *American Journal of Education* 1994;103(1):20–53.
- Garner CL, Raudenbush SW. Neighborhood effects on educational attainment: A multilevel analysis. *Sociology of Education* 1991;64(4):251–262.
- Gonzales NA, Cauce AM, Friedman RJ, Mason CA. Family, peer, and neighborhood influences on academic achievement among African-American adolescents: One-year prospective effects. *American Journal of Community Psychology* 1996;24(3):365–387. [PubMed: 8864209]
- Grant H, Dweck CS. Clarifying achievement goals and their impact. *Journal of Personality & Social Psychology* 2003;85(3):541–553. [PubMed: 14498789]
- Gruenewald PJ, Freisthler B, Remer L, LaScala EA, Treno A. Ecological models of alcohol outlets and violent assaults: Crime potentials and geospatial analysis. *Addiction* 2006;101(5):666–677. [PubMed: 16669900]
- Harding DJ. Counterfactual models of neighborhood effects: the effect of neighborhood poverty on dropping out and teenage pregnancy. *American Journal of Sociology* 2003;109:676–719.
- Howley CW. Remote possibilities: Rural children's educational aspirations. Peabody. *Journal of Education* 2006;81(2):62–80.
- Jencks, C.; Mayer, SE. The social consequences of growing up in a poor neighborhood. In: Lynn, LE., Jr; McGeary, MGH., editors. *Inner-city poverty in the United States*. Washington, D.C.: National Academy Press; 1990. p. 111-186.
- Khoury-Kassabri M, Benbenishty R, Astor RA, Zeira A. The Contributions of Community, Family, and School Variables to Student Victimization. *American Journal of Community Psychology* 2004;34(3–4):187–204. [PubMed: 15663206]
- Klebanov PK, Brooks-Gunn J, Duncan GJ. Does neighborhood and family poverty affect mothers' parenting, mental health, and social support? *Journal of Marriage & the Family* 1994;56(2):441–455.
- Krieger, N.; Chen, JT.; Waterman, PD.; Rehkopf, DH.; Subramanian, SV.; Haughton, L. *The public health disparities geocoding project training course: Geocoding, census data, and social disparities in health*. Boston, MA: Harvard University; 2006.
- Leventhal T, Brooks-Gunn J. The neighborhoods they live in: the effects of neighborhood residence on child and adolescent outcomes. *Psychological Bulletin* 2000;126(2):309–337. [PubMed: 10748645]
- Mains D. Neoliberal times: Progress, boredom, and shame among young men in urban Ethiopia. *American Ethnologist* 2007;34(4):659–673.
- McNeill LH, Kreuter MW, Subramanian SV. Social environment and physical activity: A review of concepts and evidence. *Social Science & Medicine* 2006;63(4):1011–1022. [PubMed: 16650513]
- Morenoff JD, Sampson RJ, Raudenbush SW. Neighborhood Inequality, collective efficacy, and the spatial dynamics of urban violence. *Criminology* 2001;39(3):517–558.
- Oakes JM. The (mis)estimation of neighborhood effects: Causal inference for a practicable social epidemiology. *Social Science & Medicine* 2004;58(10):1929–1952. [PubMed: 15020009]
- Osgood DW, Chambers JM. Social disorganization outside the metropolis: An analysis of rural youth violence. *Criminology* 2000;38(1):81–116.
- Pinderhughes EE, Nix R, Foster EM, Jones D. Parenting in context: Impact of neighborhood poverty, residential stability, public services, social networks, and danger on parental behaviors. *Journal of Marriage & the Family* 2001;63(4):941–953. [PubMed: 19829752]
- Plunkett SW, Abarca-Mortensen S, Behnke AO, Sands T. Neighborhood Structural Qualities, Adolescents' Perceptions of Neighborhoods, and Latino Youth Development. *Hispanic Journal of Behavioral Sciences* 2007;29(1):19–34.
- Raudenbush, SW.; Bryk, AS. *Hierarchical linear models: Applications and data analysis methods*. Newbury Park, CA: Sage Publications; 2001.
- Sampson RJ, Morenoff JD, Gannon-Rowley T. Assessing "neighborhood effects": Social processes and new directions in research. *Annual Review of Sociology* 2002;28:443–478.

- Sampson RJ, Raudenbush SW, Earls F. Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science* 1997;277(5328):918–924. [PubMed: 9252316]
- Simons RL, Johson C, Conger RD, Lorenz FO. Linking community context to quality of parenting: A study of rural families. *Rural Sociology* 1997;62(2):207–230.
- Smith AJ, Ramana R. Mental health in rural areas: Experience in south Cambridgeshire. *Psychiatric Bulletin* 1998;22(5):280–284.
- StataCorp. *Stata Statistical Software: Release 9.2*. College Station, TX: StataCorp LP; 2005.
- Thorn D, Tickamyer A, Thorne M. Poverty and income in Appalachia. *Journal of Appalachian Studies* 2004;10(3):341–357.
- Tigges LM. Introduction: Community cohesion and place attachment. *American Behavioral Scientist* 2006;50(2):139–141.
- Wigfield A, Eccles JS. Expectancy-value theory of achievement motivation. *Contemporary Educational Psychology* 2000;25(1):68–81. [PubMed: 10620382]
- Wilson, WJ. *The truly disadvantaged: The inner city, the underclass, and public policy*. Chicago, IL: University of Chicago Press; 1987.

Sample Characteristics

Table 1

	Mean	SE	95% CI lower	95% CI upper	Min	Max
Family poverty ^a	21.16	3.11	15.03	27.30	0	100
Parental education ^b	52.16	4.14	43.99	60.33	0	100
Family income ^c	35,227	708	33,831	36,624	9,678	51,676
Participants per census tract	2.78	0.24	2.28	3.28	1	13
Tract percent poverty ^d	13.15	0.69	11.77	14.53	3.62	37.34
Tract educational attainment ^e	27.57	1.41	24.75	30.38	10.0	66.68
Tract high income households ^f	12.34	0.8	10.74	13.93	1.51	36.15

^aPercent of years between ages 9–16 in which household was below the Federal Poverty Level.

^bPercent of years between ages 9–16 living with at least one parental figure having 2 year college degree or higher

^caverage household income over all waves of assessment, in U.S. dollars

^dPercent individuals in census tract living below Federal Poverty Level in 1999

^ePercent of individuals in census tract age 25 or older with 2 year college degree or higher

^fPercent of households in census tract with income ≥ \$75,000

Note. Means are weighted to adjust for behavioral risk oversampling in original sample

Table II

Pairwise Correlations, Family and Community Context Variables

	1	2	3	4	5	6
1. Family poverty	1					
2. Parental education	-0.36*	1				
3. Household income	-0.71*	0.48*	1			
4. Community poverty	0.25*	-0.11	-0.26*	1		
5. Community education	-0.22*	0.31*	0.24*	-0.39*	1	
6. Community high income	-0.26*	0.3*	0.34*	-0.63*	0.79*	1

* $p < .05$, Bonferroni corrected

Table III

Educational Attainment, Ordered Logit Regression – Poverty

Coefficients	Model 1 (n=200)	Model 2 (n=200)	Females only (n=102)	Males only (n=98)
Community poverty	.16 (.23)	.29 (.25)	.44 (.36)	.07 (.31)
Community education	.4 (.20)*	.24 (.22)	.23 (.36)	.25 (.26)
Family poverty		-.41 (.21) [†]	-.8 (.37)*	-.06 (.32)
Parental education		.51 (.22)**	.21 (.31)	.74 (.30)*
<i>Adjusted r-squared</i>	.03	.07	.1	.09
Wald <i>chi</i> ²	5.12	20.15***	9.76 [†]	21.49***

Note. Educational attainment values: no high school, high school or GED, some college, college degree

[†]
 $p < .1$,

*
 $p < .05$,

**
 $p < .01$,

 $p < .001$

Table IV

College Goal-setting, Logistic Regression - Poverty

	Model 1 (n=159)	Model 2 (n=159)	Females only (n=77)	Males only (n=82)
Community poverty	.03 (.28)	.01 (.34)	-.21 (.42)	.36 (.77)
Community education	.89 (.26)***	.73 (.3)*	.28 (.34)	1.39 (.71)*
Family poverty		0.21 (.3)	-.4 (.39)	.02 (.49)
Parental education		0.47 (.23)*	.31 (.32)	.74 (.34)*
Pseudo <i>r</i> -squared	.11	.15	.09	.29
Wald <i>chi</i> ²	13.96**	20.14***	9.65 [†]	19.7**

*
 $p < .05$,

**
 $p < .01$,

 $p < .001$