

Dropout Legacy: An Examination of Historic Neighborhood Dropout Rates on Contemporary Dropout Behavior

INTRODUCTION

Recent research has moved from understanding dropout behavior as primarily a confluence of individual and familial characteristics to include both school and neighborhood demographics independently and simultaneously (Ainsworth, 2002; Crowder & South, 2011; Harding, 2003; G. T. Wodtke, Harding, & Elwert, 2011). Understanding the complete set of factors affecting dropout behavior is vital due to the correlation that low-levels of education have with negative social outcomes, such as earning lower wages (Olneck & Kim, 1989; Warren, Grodsky, Lee, & C., 2008), having higher prevalence of criminal behavior (Lochner, 2004; Ou, 2008), and requiring more public assistance (Russell W Rumberger, 1983). Much work has already been devoted to understanding the individual factors leading to increased risk of not completing school (see Bowers (2010) for an overview). What is missing from the current literature on individual dropout behavior is the risk profiles partially determined by the child's family background, including parental education and social status (Albrecht & Albrecht, 2011; Korupp, Ganzeboom, & van der Lippe, 2002). Along with individual and familial predictors of risk, schools (Goldsmith, 2009; Owens, 2010) and neighborhoods (Crowder & South, 2011; Jackson & Mare, 2007; G. T. Wodtke et al., 2011) play an important role in a child's likelihood of not completing high school. Although the influence that neighborhoods have on individual outcomes has been studied extensively in the education literature, few studies have considered temporal components of these associations (Crowder & South, 2011; Sampson, Morenoff, & Gannon-Rowley, 2002; Wheaton & Clarke, 2003; G. T. Wodtke et al., 2011). Stated differently, place is an important predictor of individual student behavior, but time is also a very important

dimension to consider when discussing place based effects. Previous studies have investigated the association of varying lengths of individual exposure to neighborhoods (G. Wodtke, 2013; G. T. Wodtke et al., 2011), yet little work has focused on how the temporal dimension of place, as seen in local neighborhood structure and history (Sharkey & Elwert, 2011), may affect individual educational outcomes.

In order to incorporate both time and place in studies of dropout behavior, we argue that the historical development of neighborhoods, not just the contemporary outcomes of this historical development, affects individuals living in the neighborhood. To test this process, we develop the concept of ‘legacy of place’ to distinguish neighborhood effects that account for the historical development of neighborhoods from neighborhood effects which account only for the contemporary outcomes of these processes. Although neighborhoods have a potential plethora of legacies that are formed through unique social-historical processes, the focus in this paper is on one instantiation of legacy of place – dropout legacy. Dropout legacy is formed through historic social processes of economic and racial residential segregation, which influence economic and social status resource allocation based on processes of institutional racism. Over time, neighborhoods with less economic and social resources become less desirable which affects the ability of the neighborhood to attract and keep higher educated individuals in place over time.

Considering that, in terms of dropout legacy, neighborhoods change through processes of in- and out-migration of high school completers and/or non-completers or developing and retaining high school completers; attracting and keeping higher educated individuals positively changes the trajectory of the neighborhood. Therefore we argue that neighborhoods with a dropout legacy are not only qualitatively different than neighborhoods without this legacy, but

they have an independent effect on contemporary individual outcomes, specifically individual dropout behavior. Legacy links current decisions about dropout behavior to the deep rooted ideas associated with educational outcomes of place. This general hypothesis leads to the research question investigated in this paper: “What effect do neighborhoods with a dropout legacy have on an individual student’s risk of dropping out of school?” Dropout legacy is operationalized in this paper as neighborhoods that experience census tract dropout rates in the top quartile for three out of four census years from 1970 to 2000.

By adding legacy of place effects to investigations of educational attainment outcomes, educational policy makers can focus on remedying the influence of past residential segregation and institutional racism patterns on the current institution of education. From an historic place-based perspective, the concept of legacy of place is theoretically and pragmatically a new factor that needs to be considered as part of the catalogue of determinants of contemporary, individual dropout behavior.

LITERATURE REVIEW

Much research investigates the importance of neighborhood contexts on individual educational outcomes (Ainsworth, 2002; Crowder & South, 2011; Goldsmith, 2009; Harding, 2003; Owens, 2010; G. T. Wodtke et al., 2011). Although clear associations between neighborhood contexts and individual outcomes have been noted, the mechanisms behind these associations remain less clear. Literature has hypothesized that the mechanisms center on collective socialization, social capital, institutional factors, collective efficacy, and/or social control (Ainsworth, 2002; Albrecht & Albrecht, 2011; Jencks & Mayer, 1990; Sampson et al., 2002; Stanton-Salazar & Dornbusch, 1995). Ainsworth (2002) investigates the role of collective

socialization in neighborhoods as seen through role model influence on children's likelihood of completing homework and doing well in reading and math. The logic of this theory is that if a neighborhood has positive role models then students will have positive outcomes, but if a neighborhood has negative role model influences then students will have more negative outcomes. The extent to which individual students are exposed to high status neighbors is vital for this measure of collective socialization to be considered a primary mechanism for how neighborhoods impact individual student outcomes. Although studies have considered length of time an individual has lived in a neighborhood (G. Wodtke, 2013; G. T. Wodtke et al., 2011), this technique still falls short of measuring duration of exposure to high status individuals.

Another explanation of how neighborhoods influence individual educational outcomes is the amount of social capital found within the neighborhood (Sampson, 2012). Neighborhood social capital includes economic and non-economic resources found within social networks that can potentially influence student success (Ainsworth, 2002). Theoretically, social capital can be passed down to future generations of residents through the dissemination of knowledge and social networks, both of which are beneficial in the acquisition of material and/or labor market resources. In this way, social capital theories include a temporal mechanism for why one could expect past neighborhood conditions to have an impact on contemporary neighborhood and individual outcomes; although, to the best of our knowledge, neighborhood social capital has not been operationalized in this way.

A related mechanism to neighborhood social capital is that of institutional factors, which include available school and neighborhood resources (Jencks & Mayer, 1990). Institutional resources as a mechanism for why neighborhoods affect individuals are centered on the idea that the quality and quantity of accessible resources matter in achieving better outcomes for

individual students. Furthermore, the difference in condition and scope of these resources between neighborhoods matters and is likely a result of the composition of the local neighborhood based on individual demographic characteristics (Sampson et al., 2002). Institutional factors affect individuals in a concrete way as institutional resources are used towards achieving educational attainment, and also in an analogous way through relative deprivation. Individuals in neighborhoods lacking sufficient resources may realize these differences relative to other neighborhoods and respond accordingly. The response may include a withdrawal from institutions that are seen as unfair, leading to negative outcomes for these individuals. Institutional resources and relative deprivation processes in education research have been used to explain differences in attainment for minority students in white contexts compared to minority students in minority contexts (Morris, 2005; Roscigno, 1999). The current theory of dropout legacy developed in this paper extends upon this rationale by including the historic systematized process of institutional resource allocation into the discussion.

Sampson et al. (2002) discuss the idea of collective efficacy as a mechanism for neighborhood effects on educational outcomes. This theory simply states that where neighbors have feelings of trust and belonging, they are more likely to intervene for the welfare of the public good. This intervention will have positive outcomes for students as there is more investment in their wellbeing from the community which can interplay with the influence that potential role models have on students.

Lastly, neighborhood effects may operate through social control as measured through peer group influences (Jencks & Mayer, 1990; Owens, 2010; Stewart, 2007). The influence of peers on individuals in neighborhoods was largely the driving force behind the construction of the Harlem Children's Zone, which hypothesized that changing a student's environment was the

most meaningful way to increase educational outcomes (Tough, 2009). Individuals are thought to be influenced by their peer group because of desires of social acceptability. An individual will have a social desire to fit into their peer group and begin to act collectively, as the group does. This theory purports that the mechanism behind neighborhood effects are due to peer group exposure.

To summarize, theories offering causal mechanisms linking neighborhood effects to individual educational outcomes focus on collective socialization, social capital, institutional factors, collective efficacy, and social control. These theories set the groundwork for examining neighborhood influences on education outcomes for individuals, yet they have limitations that must be addressed if research questions are also interested in temporal components of these hypothesized mechanisms (Sampson et al., 2002). For instance, collective socialization theories need to address issues concerning the quantity and quality of role models in an individual's life. It may be true that some positive role models exist in a neighborhood, but how does collective socialization function if an individual is not exposed to these higher status role models or only has limited interaction with them? It is also unclear from a temporal perspective at what stage of development a youth would need to have a meaningful interaction with this role model to lead to positive educational outcomes. Theories on relative deprivation need to address the amount of knowledge that individuals in resource limited neighborhoods have about individuals in resource rich neighborhoods. Also, it may be that resource limited neighborhoods are insular and have micro economies within them, which are tailored to the types of outcomes that are normative for individuals from these neighborhoods. For example, it may be that a student from a neighborhood with high proportions of dropouts may not experience relative deprivation if they drop out of high school. This is because they may have an occupation in the micro economy in

mind when determining the risk/reward of achieving higher levels of educational attainment. This decision is likely based on current economic situations in their immediate neighborhood without a larger understanding of fluctuations in job prospects long term and historically. Lastly, theories on peer groups as a causal mechanism linking neighborhood effects to individual student outcomes need to consider possible exogenous factors driving the influence of peer groups. The peer group is influenced by other exogenous mechanisms like family background, the arrangement of physical space (i.e. the location of schools, bars, public transportation, jobs, etc.) (Sampson et al., 2002), and school environment which may be driving peer group influences. Additionally, these theories must acknowledge the possibility of selection bias into specific peer groups.

A question that may be raised when discussing neighborhood effects is, why not study family characteristics instead? Studies have examined both neighborhood contexts and family contexts simultaneously (Datcher, 1982), while others have included the school environment into this approach (Garner & Raudenbush, 1991). Findings are mixed concerning the importance of family characteristics and neighborhood influences. Some research has found that controlling for family traits is more important than neighborhood characteristics (Björklund & Jäntti, 2012), while other research has found the opposite (Wheaton & Clarke, 2003). Results from Sharkey and Elwert (2011) support the idea that controlling for family (i.e. parental) background measures while estimating neighborhood characteristics may lead to misleading conclusions. This is due to the idea that parental income and educational outcomes are, in part, a result of parental neighborhood contexts. By controlling for family background measures in neighborhood effects models, one assumes that individuals can be disconnected from their neighborhood context. Methodology controlling for both family and neighborhood background

may therefore lead to underestimation of neighborhood associations. The interplay of family characteristics and neighborhood characteristics should not be overlooked (Jencks & Mayer, 1990). The role that family characteristics play in neighborhood choice is important, as neighborhood effects likely operate through family effects (G. T. Wodtke et al., 2011). Since the research here investigates the concept of legacy of place, the focus is on how the *historic* neighborhood affects contemporary outcomes with a cognitive awareness of the intersection these processes have with family characteristics and choices made by families to live in specific neighborhoods.

Linking causal mechanisms to neighborhood effects are important in the broader discussion of the possible impacts of neighborhood structure and historic context on individual dropout behavior. Considering the temporal dimension of the research question addressed here, it is necessary to discuss the possible reasons why past neighborhood indicators may have independent effects on individual behavior even though individuals are not directly exposed to previous neighborhood contexts. The theories mentioned previously do not adequately explain the mechanisms by which local histories may influence contemporary outcomes in the contemporary space. Possible mechanisms of legacy of place include: 1) the role that current and historic residential and school segregation play in reinforcing systems that perpetuate structural racism; and 2) the perceptions that others have of the historic neighborhood.

Past residential segregation is important to the concept of dropout legacy because neighborhood formation policies that include mechanisms like racial steering, white-flight, and status-flight contribute to the historic attributes of place including school segregation. School segregation influences the amount of social capital resources available to a neighborhood which contributes to the existence of clusters of high poverty and high dropout rates. These clusters

limit the number of positive role models, positive peer group influences, and school resources available to children residing in these places. Based off these historic realities of place, contemporary perceptions about place form and perpetuate cycles of limited access to social capital resources. This mechanism assumes that places, much like brands (e.g. Coca-Cola, Apple, etc), have their own perceptions and stereotypes associated with them. People have positive, negative, or ambivalent feelings towards a place given their understanding about the place, but these feelings are separate from any actual individuals residing in the place. This is supported by research finding that when individuals have constrained knowledge about neighborhood compositions, they rely more on social networks and perceptions about neighborhoods when making decisions on where to live (Krysan, Crowder, & Bader, 2014). Negative perceptions about neighborhoods perpetually dealing with high poverty or dropout rates may prevent resources from flowing into these areas in the form of political and social capital. Legacy of place is thus conceptualized as past characteristics of an area that have socially important consequences, and which, over time, come to be seen as intrinsic attributes of a particular place. Legacy of place provides a new way of analyzing traditional studies of neighborhood effects by incorporating historic neighborhood characteristics into concepts of place.

RESEARCH HYPOTHESIS

This study seeks to answer the following research question: What effect do dropout legacy neighborhoods have on a student's risk of dropping out of school when controlling for relevant individual predictors of dropout behavior? It is hypothesized that children living in areas with persistently high proportions of dropout rates will have higher odds of not completing

high school themselves. This association, if strong enough, will remain even when controlling for student demographics, parental educational attainment, parental income, school characteristics, and contemporary neighborhood attributes. By examining the impact that areas with persistently high proportions of dropout rates have on contemporary individual behavior, the total social impact and cost of dropout behavior will be better understood.

DATA AND METHODS

In order to address the research hypothesis, individual data on dropout behavior are needed, as well as spatial indicators that allow individuals to be placed within neighborhoods. Furthermore, neighborhood data are needed which allow neighborhood demographics to be tracked across different time periods. In order to conform to these data requirements, a unique combined data set was created, which includes student data from the Education Longitudinal Study of 2002-Restricted File (Ingels et al., 2007) and information from historic and contemporary indicators of neighborhood poverty and educational attainment from the 2000 Neighborhood Change Database (GeoLytics, 2003). Included in the restricted version of the Education Longitudinal Study of 2002 (ELS-2002) are geospatial identifiers (BYGTRACT) which allow for Neighborhood Change Database (NCD) census data to be attached to each student record based on the census tract the student lived in during the ELS-2002 base year survey.

The ELS-2002 is a longitudinal study following students from the 10th grade into the labor market and postsecondary education. This analysis uses base year data from 2002, first follow-up data from 2004, and second follow-up data from 2006. The ELS-2002 first sampled schools followed by randomly sampling 10th grade students within each sample school.

Respondents to the base year survey included students, parents, and school administrators. The ELS-2002 offers the necessary diversity of questions and large sample size to carry out a thorough analysis of the association of student and parental demographics and neighborhood effects on a student's propensity to drop out of high school. For further documentation on the ELS, including sampling techniques and weighting, see Ingels et al. (2007).

Data from the 2000 Neighborhood Change Database are standardized U.S. census data from 1970, 1980, 1990, and 2000, to 2000 census tract boundaries (GeoLytics, 2003). Census tracts are used as proxies as neighborhoods, which is in line with previous studies investigating neighborhood effects (Crowder & South, 2011; Stoll, Holzer, & Ihlanfeldt, 2000). These data allow for neighborhoods to remain spatially stable over time, thus allowing neighborhood characteristics to be tracked longitudinally.

For this analysis, the concept of legacy of place was operationalized as a neighborhood with persistently high dropout rates from 1970 to 1990. Dropouts were defined as the proportion of individuals in a census tract with less than a high school education, meaning no diploma or equivalent. These proportions were calculated only for the population 25 years and over so that an adequate amount of time was allowed for an individual to obtain a diploma or equivalent. A neighborhood was considered to have a high dropout rate if it ranked in the top quartile of dropout rates for the respective census year. Persistently high dropout rates were defined as a neighborhood that lands in the top quartile two out of the possible three time points. These calculations were made before attaching these data to the individual data of the ELS-2002 so that the individual sample would not have any bearing on determining neighborhood dropout legacy.

Dependent Variable

The dependent variable used in this analysis was a dichotomous variable measuring if students dropped out of high school at some point in time during the survey. Students without evidence of having dropped out were coded as '0' and students with evidence of having dropped out were coded as '1'. Dropout information was gathered from the second-year follow-up. A student in the first follow-up was considered having dropped out if they were out of school in the spring term of 2004 and had not yet received a diploma or GED and missed four or more weeks of school not due to illness or accident. The second follow-up updates first follow-up dropouts. If students were reported as having dropped out in the first follow-up then they were kept as such in the second follow-up. Furthermore, students who reported in the second follow-up that they completed their GED since the last interview or had yet to receive a high school diploma and were not in a completion program were classified as having dropped out. Students could also be classified as having dropped out if their transcript indicated that they had dropped out, were dismissed, were incarcerated, or had received a GED. (Ingels et al., 2007)

Independent Variables

Previous research has shown that males are more likely to drop out of high school compared to females and that there are racial differences seen in students who dropout (Bowers, 2010; Ravitch, 2013). Therefore there are two student demographic variables including sex and race. Race was measured by a series of dummy variables including Hispanic, black non-Hispanic, Asian non-Hispanic, and other non-Hispanic with white non-Hispanic being the reference group. The other non-Hispanic category included student's choosing more than one race, Native Hawaiian/Pacific Islander, and American Indian/Alaskan Native non-Hispanic.

Also included in the analyses is a composite measure of standardized test scores (R. Rumberger & Lim, 2008).

Other research has shown that students with parents from lower SES backgrounds, measured by education and income, had higher probabilities of dropping out compared to those from high SES backgrounds (Dalton, Glennie, & Ingels, 2009; Russell W. Rumberger & Rotermund, 2012). In the base year survey, parents were asked what the highest level of education they had completed with eight possible choices ranging from ‘did not finish high school’ to ‘completed PhD, MD, or other advanced degree’. Both mother’s and father’s education was obtained where available. If either mother’s or father’s education was missing from the parent survey then it was obtained from the student base year survey. The parent with the highest level of education completed was used to represent parental education. Parental education was measured using the following categories: 1) less than high school (reference); 2) high school or GED; 3) some college; and 4) college or greater.

Parental income was reported, in the survey, as a thirteen level categorical income variable in the original survey ranging from ‘None’ to ‘\$200,001 or more’. To make income continuous, we used the median value of each category and assigned this value as parental income. Incomes in the bottom and top category were assigned zero and \$200,001 respectively. The transformed income variable was then logged in the regression analyses.

School type and area urbanicity were also included in the full models, which is in line with research that has investigated differences in dropout rates based on urbanicity (Jordan, Kostandini, & Mykerezi, 2012; Russell W. Rumberger & Thomas, 2000). School type was measured as a series of dummy variables indicating if a school was private, catholic, or public (reference). School type was determined in the original sample by the Common Core of Data

1999-2000 and the Private School Survey 1999-2000 (Ingels et al., 2007). A series of dummy variables was included to control for the community setting where rural (small town or rural community) and suburban (urban fringe of large or mid-size city) were compared to urban (large or mid-sized central city) areas (Lankford, Loeb, & Wyckoff, 2002; Roscigno, Tomaskovic-Devey, & Crowley, 2006).

Considering the research question centers on neighborhood context, controls for contemporary neighborhood attributes are included in the analyses including: the contemporary dropout rate, the employment rate, a measure of poverty, and neighborhood stability. The employment rate is the proportion of the civilian population 16+ employed in the neighborhood divided by the population 16 and over. High poverty areas have been defined in previous literature as neighborhoods between 20-40% or more poverty (Jargowsky, 1997; Wilson, 2012). Sensitivity tests did not reveal any difference in magnitude or significance for the effect of high poverty neighborhoods on dropout behavior when measured at varying levels (20%, 30%, and 40%). We include a dummy variable for neighborhoods with at least 30% poverty and also test for how high poverty neighborhoods of varying levels correlate with legacy neighborhoods.

Finally, a neighborhood stability variable was added to full models in the analyses below. By controlling for neighborhood stability, the true effects of place can be tested as opposed to a legacy of the same token individuals within a given place. Granted, individuals with similar demographic characteristics may inhabit a particular area, but it is not attributes of the individual that are displayed in potential findings of legacy effects, but rather the area which is attracting similarly socially positioned individuals. In other words, by controlling for neighborhood stability, we control against legacy being a proxy for a continuation of the same individuals in the neighborhood. If legacy effects remain when controlling for neighborhood stability, then one

can reasonably argue that legacy of place has independent effects outside of individuals remaining or moving from a neighborhood. We hypothesize that legacy of place effects will remain, and evidence for this hypothesis can be seen in the work of Sampson (2012), as he found that nearly fifty percent of the Project on Human Development in Chicago Neighborhoods sample moved during the observation period, yet neighborhoods continued to maintain their demographic profiles.

The neighborhood stability variable was created using two sources of information from tract data for 2000. First, the proportion of occupied housing units where the householder moved in before 1980 was calculated. Second, in order to control for the fact that some neighborhoods may have older housing structures making it more likely that they would have more individuals who moved in before 1980, this variable was standardized by the number of housing units built before 1980. The proportion of individuals who moved in to their house before 1980 was divided by the proportion of houses built before 1980. The resulting proportion can be understood as the proportion of individuals who have remained in the neighborhood since before 1980. These individuals are referred to as foundation neighbors. If the current proportion of foundation neighbors equals the proportion of houses built before 1980 then we could say that all of the possible foundation neighbors remain, making the neighborhood more stable.

For example, imagine two separate neighborhoods. Neighborhood A has a proportion of individuals who moved into their homes before 1980 equal to 0.35, and this neighborhood is composed of 68% of houses built before 1980. Neighborhood B has a proportion of individuals who moved into their homes before 1980 equal to 0.20 and 23% of houses built before 1980. Neighborhood A would have a proportion of foundation neighbors equal to 0.5147 ($0.35/0.68$). In other words 51.47% of the possible foundation neighbors remain in Neighborhood A.

Neighborhood B has a lower percentage of individuals who moved in before 1980 compared to Neighborhood A, but has a higher proportion of foundation neighbors (0.20/0.23) or 0.8696. Said another way, 86.96% of the possible foundation neighbors remain in Neighborhood B.

Analytic Strategy

Considering the binary distribution of the dependent variable, logistic regression was used to estimate the coefficients. Multilevel models were used as they allow for coefficient estimation of nested data across schools. Nested models were used to determine how the relationship between legacy of place and student dropout behavior changes with the introduction of student, parent, school, and neighborhood stability variables. To further understand legacy areas, cross tabulations are presented to see if legacy neighborhoods are just a proxy for high poverty areas. The final model takes the following form (Luke, 2004):

Equation: Multilevel Logistic Regression of Student Dropout Episode on Predictors with Random Intercept for Neighborhoods

$$\ln \left[\frac{p_{ij}}{1 - p_{ij}} \right] = \beta_{0j} + \beta_1 \text{Dropout Legacy}_{ij} + \beta_2 \text{Sex}_{ij} + \beta_3 \text{Student Race}_{ij} \\ + \beta_4 \text{Parental Education}_{ij} + \beta_5 \text{Parental Income}_{ij} \\ + \beta_6 \text{School Characteristics}_j + \beta_8 \text{Neighborhood Attributes}_{ij} + r_{ij};$$

Where $\beta_{0j} = \gamma_{00} + \gamma_{01}W_j + \mu_j$

Limitations

There are several limitations to the current study that should be noted. First, children's residence was captured at the base-year survey. Measuring residence at one point in time ignores possible moves into and out of legacy neighborhoods. Also, the length of exposure to these neighborhoods as measured by length of stay are not captured in these data. Second, the sample

only includes students from the tenth grade onward, ignoring students who may have dropped out of formal education prior to tenth grade. Students who dropped out before the tenth grade may be demographically different than those who stayed in school long enough to be included in the sampling frame. The effect of dropout legacy may be even greater than reported in the analyses above if more students who drop out before the tenth grade reside in dropout legacy neighborhoods or less if these students reside in non-dropout legacy neighborhoods.

RESULTS

Table 1 shows the weighted means and standard errors for all variables in the analyses for the entire sample and stratified by neighborhood type (legacy/non-legacy). The dependent variable shows that about 12.9% of the entire sample is considered to have dropped out of school. White students make up about 57.1% of the sample followed by Hispanic students (17.7%) and black students (15.0%) as the largest represented racial groups. Most students are from families whose parents have some college education (57.3%) and have an average income of \$63,071. Also, most students attend public schools (91.2%) and go to schools in suburban areas (48.88%). Looking at the means stratified by legacy status, students living in legacy and non-legacy neighborhoods are different in important ways.

Around 19.7% of students living in legacy neighborhoods experienced a dropout episode compared to 11.2% of students living in non-legacy neighborhoods. There also appears to be a racial difference, as students living in legacy neighborhoods are more likely to be racial minorities compared to students living in non-legacy neighborhoods (63% of students in non-legacy neighborhoods are white). Another major difference between the two areas is found in parental education and income as students' parents in legacy areas have lower educational attainment and income compared to students' parents in non-legacy places. Lastly, differences

are seen in the urbanicity of schools attended, as a greater proportion of students in legacy neighborhoods attend schools in urban areas and a greater proportion of students in non-legacy neighborhoods attend schools in suburban and rural areas.

[Table 1 Here]

Table 2 shows three models, each including the main effect of legacy of place on student dropout behavior. Model 1 only includes the influence of dropout legacy on the probability of dropping out of school without any other predictors. This model shows that students living in a dropout legacy neighborhood are over 40% more likely to drop out of school compared to students not living in these neighborhoods. Model 2 adds student, parental, and school characteristics to Model 1. After controlling for these indicators, students living in a dropout legacy neighborhood are 15.1% more likely to drop out compared to their peers in non-legacy neighborhoods. The results show a large gender gap in risk of dropping out as males are almost twice as likely as females to experience a dropout episode. The results also point to racial gaps in the risk of dropping out. Hispanics are just under 8% more likely and blacks are 5.5% more likely to experience a dropout episode compared to whites. Students who identify as Asian demonstrate lower odds of dropping out compared to students who identify as white.

In line with previous research, which has found strong correlations between parental SES and student educational attainment (Dalton et al., 2009; Russell W. Rumberger & Rotermund, 2012), the results show that students whose parents did not graduate from high school are more likely to drop out themselves compared to students whose parents received a high school diploma/GED or greater. Also, family income is an important predictor of dropout behavior as increases in family income are correlated with lower odds of students experiencing a dropout episode. Students who attended catholic or private schools are less likely to drop out of school

compared to student who attended public schools. Students from rural and urban areas do not show any difference in the odds of dropping out. This finding is similar to research done by Jordan et al. (2012).

The final model considers the influence of contemporary neighborhood attributes on dropout legacy. In this model, even when controlling for contemporary dropout rates at the neighborhood level, the effect of legacy of place remains and predicts that students residing in dropout legacy neighborhoods will have 26.4% higher odds of dropping out compared to students who do not reside in these neighborhoods, all else being held equal. One may expect that contemporary indicators of dropout rates would eliminate any legacy effect, yet, this final model provides the strongest evidence for an independent legacy effect on students' odds of dropping out of school. The influence of legacy also remains with the inclusion of our measure of neighborhood stability, as students are less likely to drop out in neighborhoods with above average stability. This finding evidences that legacy is more than a proxy for the same individuals remaining in the neighborhood. Instead, the independent effect of legacy lends strong support for our theoretical hypothesis that historic process of structural racism as seen through racial and economic segregation have lasting influences on contemporary outcomes.

[Table 2 Here]

Dropout Legacy Neighborhoods

So far, the results have focused on the influence that dropout legacy areas have on student dropout behavior. Now attention is turned to investigating the demographic profile of these legacy neighborhoods and how dropout behavior works differently in these areas compared to non-legacy neighborhoods. It may be argued that legacy neighborhoods are merely a proxy for

high poverty neighborhoods and that high poverty neighborhoods and legacy neighborhoods are synonymous. Table 3 provides cross-tabulations for students living in high poverty neighborhoods and dropout legacy neighborhoods to test this premise. The results show little correlation between dropout legacy neighborhoods and high poverty areas when these areas are measured as 40% or greater or 30% greater. Of students living in a legacy neighborhood, a majority (89.55%) do not simultaneously live in a neighborhood with 40% or more poverty. On the other hand, most (91.3%) students living in high poverty areas also live in dropout legacy neighborhoods. A similar pattern holds for neighborhoods with 30% or more poverty, as over 70% of students living in legacy areas do not live in high poverty neighborhoods. Once again, when high poverty areas are measured as 30% or more poverty, a vast majority (83.33%) of students living in high poverty areas also live in dropout legacy areas.

[Table 3 Here]

When high poverty areas are considered to have 20% or more poverty, less than half (49.25%) of students living in dropout legacy areas also live in high poverty areas. A majority of students living in high poverty areas (63.06%) reside in dropout legacy areas when high poverty is calculated as 20% or more. These results reveal a couple of important things about how dropout legacy areas correlate with high poverty areas. One is that when high poverty areas are considered to be 30% or more or 40% or more, there is little evidence that the concept of dropout legacy is equivalent to the concept of high poverty areas. When high poverty areas are defined as areas with 20% or more poverty, then there is some evidence that this concept is related to dropout legacy neighborhoods. It could be argued that this evidence is not strong, as there are still 50.75% of students who live in neighborhoods that are only characterized as dropout legacy neighborhoods and not as high poverty. Furthermore, 37% of students live in neighborhoods

characterized as solely high poverty areas and not simultaneously considered dropout legacy neighborhoods. Of students who live in either a high poverty and/or a dropout legacy neighborhood, 49.25% live in neighborhoods simultaneously characterized as high poverty and legacy areas. This is further evidence that these two measures capture separate social concepts.

DISCUSSION AND CONCLUSION: *Towards a More Promising Future*

Structural racism is a concept that is difficult to measure. This difficulty arises from the fact that structural racism is a process of past patterns of residential and school segregation which lead to current compositions of place. These compositions have been studied in past neighborhood effects literature as research has shown that the neighborhood a child is raised in is important to that child's current well-being, as well as future outcomes including educational attainment (Crowder & South, 2011; Jackson & Mare, 2007; Jencks & Mayer, 1990; Leventhal & Brooks-Gunn, 2000; G. T. Wodtke et al., 2011). The present study not only offers a test for the validity of this research, but it poses a new possible contextual effect on educational outcomes, that of legacy of place. Legacy of place is different than traditional neighborhood effects literature in that it is not dependent upon current social actors within a defined geographic area, but rather carries its own historical weight. Legacy of place's operationalization and emphasis on historic neighborhood compositions allows for a quantitative study of the consequences of structural racism when studying contemporary educational outcomes of individuals.

This study hypothesized that the social history of an area would have a present day influence on individual student dropout behavior. To test this general hypothesis, past census tract dropout data were used in models along with contemporary covariates predicting dropout behavior. After estimating several models controlling for student, parent, school, and

neighborhood influences on student dropout behavior, strong evidence in support of the idea that not only does legacy of place matter, it is an important predictor of contemporary dropout behavior.

Results found that students living in neighborhoods with persistently high dropout rates, defined as being in the top quartile in two out of three census years from 1970 to 1990, had over 26% higher odds of dropping out of school compared to their peers not living in these types of neighborhoods. These results reveal just how important the impact of structural racism seen through dropout legacy is on a student's propensity to drop out of school and that it may be more predictive than individual student demographics alone. Secondly, it may reveal the importance of creating policies which deal with historic neighborhood racial and economic segregation when attempts are made to equalize educational outcomes among different racial groups. Additional examination of the data reveals that minorities are more likely to reside in dropout legacy neighborhoods compared to whites. Also, past research has shown that minorities are less likely to move out of their neighborhoods and less likely to improve their environments if they do move, compared to whites (Harding, 2003). Furthermore, previous research finds that neighborhoods with high contemporary dropout rates are more likely to pass on this characteristic to the younger generation (Saenz & Siordia, 2012). These past findings together with results found here show the importance of creating policies that address the needs and structural histories of dropout legacy neighborhoods in order to end cycles of low education.

The results also give some evidence of the extent to which dropout legacy is a replication of individuals remaining in the neighborhood as opposed to a characteristic of place. Further, if legacy of place effects only capture personal histories of individuals remaining within the neighborhood then simple non-temporal neighborhood effects may suffice. Yet, the results tell a

different story. The neighborhood stability variable showed that the more foundation neighbors living in an area is actually good for students' odds of completing school. This finding gives support that dropout legacy is a characteristic of place as opposed to a continuation of neighbors with low levels of education remaining in the area over time thus lowering the education profile of the neighborhood. If legacy of place was simply a continuation of non-completers remaining in the neighborhood then we would expect the direction of the effect of neighborhood stability to be the same as the effect of dropout legacy – but it is not.

Lastly, the results presented here give evidence that dropout legacy and high poverty are not synonyms or proxies for the same concept. Results showed that when high poverty neighborhoods are categorized as 30% or more and 40% or more in poverty there is little evidence that high poverty neighborhoods are the same as dropout legacy areas. When high poverty neighborhoods are defined as 20% or more residents in poverty, there is some overlap of these concepts as 63% of students living in high poverty areas also live in legacy neighborhoods. Also, a little under 50% of students who live in a legacy neighborhood also live in a high poverty neighborhood using the 20% or more categorization of high poverty. Still, over half of students live in neighborhoods defined as legacy areas, but not as high poverty areas. These results show that although there is some overlap in neighborhoods defined simultaneously as high poverty and dropout legacy, ultimately these two measures are capturing separate concepts.

The main difference is that the concept of legacy of place deals with the temporal and spatial characteristics of place and how these places are products of systemic differential allocation of resources and also agents producing continued disparities as seen here with student dropout behavior. Poverty is an outcome largely based on educational attainment and gendered and racial labor market disparities. Poverty is also more fluid in nature compared to educational

attainment in an individual's life. By looking at persistently high dropout rates in given neighborhoods, the concept of legacy of place separates itself from studies of poverty, even high poverty areas, by focusing instead on the conditions which may lead to individuals being denied the resources that will lead to labor market success, higher incomes, and lower individual poverty. Legacy of place considers the mechanisms of past residential and school segregation simultaneously and incorporates these measures into individual models of dropout behavior. Studies which only consider contemporary neighborhood poverty miss out on capturing the structural reasons for such neighborhood compositions as they fail to incorporate historic realities of the neighborhood and understand the fluid nature of poverty in an individual's life. Because education is less fluid, it is a better indicator of neighborhood and individual life-long disadvantage, as evidenced in this research.

Research presented here gives strong support for the influence of the social history of place. Students attending schools in neighborhoods with a dropout legacy are more likely to drop out of school themselves. The results give credence to the idea that areas have their own influence outside of the collection of individuals presently occupying the contemporary space. These results also give support to the lasting influence that dropping out of high school has on individuals and neighborhoods. It is true that dropping out of high school will negatively alter individuals' job and wage opportunities (Campolieti, Fang, & Gunderson, 2010), but on a larger scale, the research presented here shows how dropping out affects neighborhoods in important and policy relevant ways.

Policy should focus not only on helping individual students to graduate high school, but also look into ways to break cycles of dropout behavior within neighborhoods, especially dropout legacy neighborhoods. Given the growing interconnectedness of American society, it

would benefit all if everyone had the opportunity to reach their full economic earning potential by achieving the highest levels of education necessary for sufficient labor market demands and rewards. If educating everyone fully is seen as beneficial to all of society, which we would argue it is considering the high costs of social ills, then more support should be garnered to implement a holistic approach to educating children properly and identifying risk factors that may prohibit them from completing the amount of education they want/aspire to. We have seen reform efforts in the past allow for more of a hands off approach as was seen in the self-directed study movement and the negative consequences it had on children from impoverished backgrounds (Ravitch, 2000). Counter to this philosophy is one which galvanizes the masses to be active participants in the welfare of all children so that their own children can have a happier, safer future.

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Table 1 - Descriptive Statistics of Variables Used in Analysis by Neighborhood Type

Variable	ELS-2002 Variable Name	All Neighborhoods		Legacy Neighborhoods		Non-Legacy Neighborhoods	
		Mean	Std Error	Mean	Std Error	Mean	Std Error
Dropout Episode	F2EVERDO	0.129	0.005	0.197	0.010	0.112	0.005
<i>Student Variables</i>							
Sex (Male=1)	BYSEX	0.498	0.006	0.470	0.012	0.505	0.006
White	BYRACE_R	0.571	0.010	0.333	0.019	0.630	0.011
Hispanic	BYRACE_R	0.177	0.010	0.333	0.024	0.139	0.008
Black	BYRACE_R	0.150	0.008	0.266	0.018	0.122	0.008
Asian	BYRACE_R	0.045	0.003	0.031	0.004	0.048	0.003
Other	BYRACE_R	0.056	0.003	0.036	0.004	0.061	0.003
Standardized Test Scores	BYTXCSTD	50.45	0.221	45.69	0.309	51.61	0.224
<i>Parental Variables</i>							
No High School	BYPARED	0.064	0.004	0.161	0.012	0.040	0.003
High School or GED	BYPARED	0.187	0.005	0.268	0.009	0.167	0.005
Some College	BYPARED	0.573	0.007	0.488	0.014	0.594	0.008
College Graduate or Greater	BYPARED	0.176	0.006	0.083	0.006	0.198	0.007
Transformed Income	BYINCOME	63,071	877.10	39,931	898.10	68,743	928.60
<i>School Variables</i>							
Public School	BYSCTRL	0.912	0.003	0.949	0.004	0.902	0.004
Catholic School	BYSCTRL	0.054	0.002	0.035	0.004	0.058	0.003
Private School	BYSCTRL	0.035	0.003	0.016	0.001	0.039	0.003
Urban	BYURBAN	0.369	0.009	0.503	0.021	0.337	0.010
Suburb	BYURBAN	0.488	0.009	0.382	0.021	0.514	0.011
Rural	BYURBAN	0.143	0.006	0.116	0.008	0.150	0.008
<i>Neighborhood Variables</i>							
Dropout Legacy	NCDB	0.164	0.010	-	-	-	-
Proportion Dropout	NCDB	0.1951	0.0048	0.3935	0.0099	0.1465	0.0028
Proportion Employed	NCDB	0.788	0.003	0.678	0.006	0.271	0.023
High Poverty Area (Yes=1)	NCDB	0.022	0.003	0.283	0.025	0.015	0.002
Foundation Neighbors	NCDB	0.295	0.003	0.305	0.006	0.293	0.003
N ~		10,530		2,010		8,520	

Data: U.S. Department of Education, National Center for Education Statistics, Education Longitudinal Study of 2002 - Restricted Use Data; Neighborhood Change Database 2000; Survey design with Panel Weight F2BYWT; Student N rounded for confidentiality

Table 2 - Multilevel Logistic Regression of Dropout Episodes on Dropout Legacy and Student, Parent, and School Demographics (School N ~ 640; Student N~10,530)

Variables	Model 1		Model 2		Model 3	
	β	OR	β	OR	β	OR
Dropout Legacy (Yes=1)	0.338***	1.402	0.141***	1.151	0.234***	1.264
Sex (Male=1)			0.595***	1.813	0.592***	1.808
<i>Student Race</i> ^A						
Hispanic			0.074***	1.077	0.067***	1.069
Black			0.054***	1.055	0.051***	1.052
Asian			-0.365***	0.694	-0.383***	0.682
Other			0.346***	1.413	0.345***	1.412
Standardized Test Scores			-0.748***	0.473	-0.746***	0.474
<i>Parent's Education</i> ^B						
High School or GED			-0.222***	0.801	-0.239***	0.787
Some College			-0.594***	0.552	-0.618***	0.539
College or Greater			-0.585***	0.557	-0.616***	0.54
Log Parent's Income			-0.059***	0.943	-0.06***	0.942
<i>School Type</i> ^C						
Catholic			-3.025***	0.049	-3.106***	0.045
Private			-1.34*	0.262	-1.394*	0.248
<i>Urbanicity</i> ^D						
Suburb			-0.703*	0.495	-0.617	
Rural			-0.374		-0.259	
<i>Neighborhood Variables</i>						
Proportion Dropout					-0.104***	0.901
Proportion Employed					-0.014***	0.986
High Poverty Area (Yes=1)					0.13***	1.139
Proportion Foundation Neighbors					-0.194***	0.824
Intercept		-4.636***		-3.041***		-3.102***
AIC		1,544,581		1,410,336		1,405,478
σ_{β}^2		16.82		13.91		13.95

Data: U.S. Department of Education, National Center for Education Statistics, Education Longitudinal Study of 2002 - Restricted Use Data; Neighborhood Change Database 2000; a - Reference is 'White'; b - Reference is 'No High School'; c - Reference is 'Public School'; d - Reference is 'Urban'; Data are weighted using Panel Weight F2BYWT; *P<.05, **P<.01, ***P<.001; School and Student N rounded for confidentiality

Table 3 - Cross Tabulation of 2000 High Poverty Areas and Dropout Legacy Measures (Column Percent in Parenthesis - Rounded for confidentiality)

High Poverty Area Measurement	Dropout Legacy		
	Yes	No	Total
2000 High Poverty Area (40% >)			
Yes	210 (10.45)	20 (0.24)	230
No	1,800 (89.55)	8,500 (99.76)	10,300
2000 High Poverty Area (30% >)			
Yes	550 (27.36)	110 (1.29)	660
No	1,460 (72.64)	8,410 (98.71)	9,870
2000 High Poverty Area (20% >)			
Yes	990 (49.25)	580 (6.81)	1,570
No	1,020 (50.75)	7,940 (93.19)	8,960

Data: U.S. Department of Education, National Center for Education Statistics,
Education Longitudinal Study of 2002 - Restricted Use Data

Table 4 - Multilevel Logistic Regression of Dropout Episodes on Student, Parent, and School Demographics by Legacy and Non-Legacy Areas

Variables	Legacy Areas		Non-Legacy Areas	
	β	OR	β	OR
Sex (Male=1)	0.666***	1.946	0.61***	1.84
<i>Student Race</i> ^A				
Hispanic	-0.976***	0.377	0.36***	1.433
Black	0.089***	1.093	0	
Asian	-1.813***	0.163	-0.237***	0.789
Other	0.634***	1.885	0.383***	1.467
Standardized Test Scores	-0.729***	0.482	-0.777***	0.46
<i>Parent's Education</i> ^B				
High School or GED	-0.133***	0.875	-0.391***	0.676
Some College	-0.734***	0.48	-0.682***	0.506
College or Greater	-0.612***	0.542	-0.737***	0.479
Log Parent's Income	-0.064***	0.938	-0.059***	0.943
<i>School Type</i> ^C				
Catholic	-4.675***	0.009	-3.569***	0.028
Private	-2.135		-1.776*	0.169
<i>Urbanicity</i> ^D				
Suburb	1.335		-0.336	
Rural	-3.308*	0.037	-0.005	
<i>Neighborhood Variables</i>				
Proportion Dropout	-0.353***	0.703	-0.066***	0.936
Proportion Employed	0.038***	1.039	-0.064***	0.938
High Poverty Area (Yes=1)	0.311***	1.365	0.308***	1.361
Proportion Foundation Neighbors	-0.207***	0.813	-0.244***	0.783
Intercept	-6.388***		-4.228***	
School N	350		620	
Student N	2,010		8,520	
σ^2_{β}	54.47		20.33	

Data: U.S. Department of Education, National Center for Education Statistics, Education Longitudinal Study of 2002 - Restricted Use Data; Neighborhood Change Database 2000; a - Reference is 'White'; b - Reference is 'No High School'; c - Reference is 'Public School'; d - Reference is 'Urban'; Data are weighted using Panel Weight F2BYWT; *P<.05, **P<.01, ***P<.001; School and Student N rounded for confidentiality