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Stability and Change in Rural Youths' Educational outcomes through the Middle and High School Years

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Abstract

There is a dearth of literature that examines rural youths' school transition and adaptation over the middle and high school years. Given rural education challenges, this study examines rural youths' developmental trajectories of self-reported grades and affective and behavioral educational outcomes (i.e., school belonging, value of education, school misbehavior, and extracurricular activity participation). The cohort-sequential study consisted of 3,312 African American and White youth (50% female) who were surveyed over three and a half years, including the transition to high school. The results reveal significant changes in the outcomes from sixth to twelfth grade. For example, on average, school misbehavior increased over time while perceived school belonging decreased over time. Gender and race differences emerged; African American youth reported placing higher importance on education and less participation in school activities than White youth. The discussion focuses on the importance of examining rural adolescents' educational pathways during the high school transition.

Keywords

rural; adolescents; middle school; high school transition; school and educational outcomes

The transitions from elementary to middle school and middle to high school are normative for U.S. youth in public schools. But for many youth, these transitions bring about changes – for better and for worse – in schooling experiences and educational outcomes. Negative changes, such as declines in feelings of school connectedness and academic achievement, may reflect discontinuities between the developmental needs of youth and their changing environments (Eccles et al., 1993). Positive changes, such as greater engagement in school activities, may reflect opportunities available to students in a new school environment

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(Mahoney, Lord, & Carryl, 2005). While the elementary to middle school experience has been extensively researched, the middle to high school experience has received much less attention. Yet, schooling experiences and educational outcomes during these years may have long-term and far-reaching implications for life chances in higher education and employment (Reyes, Gillock, Kobus, & Sanchez, 2000; Weiss & Bearman, 2007).

The purpose of this article is to examine developmental patterns over the course of middle and high school for a variety of schooling-related indicators. As appropriate to such an investigation, this study examines trajectories of change using longitudinal data spanning grades 6 through 12. The sample is rural and provides the opportunity to compare the findings to those reported elsewhere for urban youth; the schooling experiences of urban and, to a lesser extent, suburban youth have been much more frequently studied than those of rural youth. Moreover, the current sample includes almost equal proportions of White and African American youth; most studies that examine school experiences of rural youth have not used racially or ethnically diverse samples (Kerpelman, Eryigit, & Stephens, 2008; Mello, 2009). This study examines whether patterns of educational and school experiences vary between White and African American youth, as well as by other socio-demographic characteristics. The schooling indicators examined include the grades students report receiving, affective indicators of the school experience, including students' sense of school belonging and the value they place on education, and behavioral indicators of school experience, including school misbehavior and participation in extracurricular activity.

Theoretical Frameworks

Adolescence is as a period of many changes—physical, social, and psychological. It is also a period when youth go through normative transitions within the U.S. educational system as they move from middle to high school. Researchers argue that developmental change coupled with the transition from middle to high school may have consequences for youth's school and educational outcomes. Examination of change in rural youth's educational outcomes over the course of middle and high school can be framed theoretically by both life course theory (Elder, 1998) and stage-environment fit (Eccles et al., 1993). Both frameworks suggest the importance of the transition to high school, a potential turning point in the life course, and the need to consider the extent to which the demands of the environment match the developmental stage of the individual.

Elder (1998) suggests that to understand the life course, one must examine “interlocking trajectories” (p. 7). That is, simultaneous changes in environment and behavior—as in changing school environments and changing school experiences and educational outcomes. The life course perspective suggests that transitions are shaped by both societal obstacles and opportunity structures, and that transitions offer insight into developmental change. The timing of these transitions has developmental impacts and may act as “turning points.” Turning points are set in motion by the possibility of a new beginning in a new institution/structure that can offer a chance for change or personal growth. The transition to high school, when most youth enter a new setting with new rules, new teachers, and a new mix of peers offers such a “turning point” that may set in motion a particular pathway of development (Benner & Graham, 2009).

Eccles and colleagues (1993) similarly suggest that stage-environment fit is important for youth development and warn that school transitions may offer a “developmental mismatch” for youth. The characterization of adolescence as a turbulent period may be a consequence of a mismatch between the developing individual and the social settings he/she experiences. Focusing on the transition from elementary to junior high school, Eccles and colleagues asserted that decreases in school-related measures, such as diminished teacher-student relationships, were a result of improper school environments for early adolescents’ individual needs. Similarly, the transition from middle to high school may create a mismatch between students’ developmental needs and the opportunities offered by the high school setting.

For example, after the transition to high school, youth who were once the oldest adolescents in middle school are now the youngest adolescents in the high school and at the bottom of the social hierarchy. Youth often transition from a middle school that was larger than their elementary school to an even larger high school where students may feel invisible. At the same time, youth are expected to exercise more autonomy in their interactions with peers and authority figures. They place increasing importance on their relationships with peers (same or opposite sex), and this priority may be in opposition to the demands of schooling. Such challenges suggest considerable opportunities for friction between the high school environment and the developmental needs of youth.

Schooling Experiences of Rural Youth in Middle and High School

The present study examines rural students’ grades, affective school characteristics (i.e., school belonging and value of education) and behavioral school outcomes (i.e., extracurricular activities and school misbehavior) from 6th to 12th grade. As evident from the following review of the literature for these outcomes, there is some inconsistency in the findings making some generalizations difficult. Much of the inconsistency is due to differences in samples, study designs (cross-sectional versus longitudinal) and measures (varying operationalizations of similar constructs). This review highlights any descriptive evidence for rural youth.

School belonging is a psychological construct tapping one’s connection to school and is associated with higher academic achievement (Barber & Olsen, 2004). Evidence from cross-sectional studies suggests that school connection may decrease and then increase over time, with no difference by rurality. Stanley, Comello, Edwards, & Marquart (2008) found that 8th and 9th graders showed less bonding than 7th graders, and that 11th and 12th graders reported higher bonding than 10th grade students. Similarly, in a rural sample, Perry & McIntire (2001) reported a continual decrease in school connection from 6th to 10th grade and an increase in connection from 11th to 12th grade. With a nationally representative sample, McNeely, Nonemaker, & Blum (2002) found no difference in youth reports of school connectedness for rural, suburban, or urban youth. Although there is mixed evidence about gender differences in school belonging, most studies suggest that females report higher levels of belonging (Rostosky, Owens, Zimmerman, & Riggle, 2003).

Youth's views about the value and importance of education may be assessed by their educational aspirations and expectations. In general, earlier studies suggested that rural youth's educational aspirations were lower than their non-rural counterparts (MacBrayne, 1987). More recent studies show increases in rural youth's aspirations on par with urban youth (Crockett & Bingham, 2000; Meece & Farmer, 2009). One longitudinal study with predominantly White youth showed that most rural youth have stable and high (i.e., Bachelor's degree or higher) educational aspirations from 7th to 11th grade (Snyder, 2010). With a sample of rural African American youth, Kerpelman et al. (2008) found that youth reported moderate to high levels of thoughts and plans about their future education.

Some gender, race, and SES differences in educational aspirations have been found with rural samples, but the findings are mixed. Cross-sectional studies show that females report higher educational aspirations (Irvin, Meece, Byun, Farmer, & Hutchins, 2010; Kerpelman et al., 2008) than males, and minority youth aspire to higher educational statuses than White youth (Irvin et al., 2010), yet, rural African American male youth have the lowest educational aspirations when compared to urban and suburban males. With African American samples, Kerpelman et al. (2008) found no SES differences in rural African American youth's thoughts and plans for the future while Strayhorn (2009) found that low SES rural males had lower aspirations than high SES suburban males. Longitudinal studies with national data suggest that developmental trajectories of educational expectations are fairly stable over time with slight declines from 8th to 10th grade and a subsequent rebound from 10th to 12th grade (Mello, 2008, 2009). These studies show no gender differences (Mello, 2008) in educational expectation trajectories for an ethnically diverse sample, but race/ethnic differences were found in educational expectations with African American students reporting the highest levels (Mello, 2009).

Youth's academic achievement tends to decline across time. Stanley et al. (2008) showed with a national sample of 7th – 12th graders that there was no difference between urban and rural youth in this pattern of declining school performance. Yet Estell, Farmer, Irvin, Thompson, & Hutchins (2007) found that rural African American youth who had positive academic functioning in middle school continued to do so with the transition to high school. Other research with urban youth suggests that minority males have the greatest academic difficulty in high school. Roderick (2003) showed that African American males experienced greater declines in academic achievement across the transition to high school than their female peers. In addition, poor youth experience more challenges to achievement than their non-poor counterparts (McLoyd et al., 2009).

As students' grades may decrease over time, school misbehavior may increase (Cillessen, Mayuex, 2007; Karriker-Jaffe, Foshee, Ennett, & Suchindran, 2008). Several studies with rural youth have shown that between about one-quarter to one-third of rural youth can be characterized as physically aggressive. Swaim and colleagues (2006) found that 33 percent of rural middle school youth were physically aggressive at school in the past 30 days, and Linville and Huebner (2005) found that 34% of rural youth in 8th-12th grade had a physical fight in the preceding year. Another study found that twenty-five percent of low-income rural and urban African American youth were characterized by a single-risk profile, which included academic risk, aggression, and low popularity (Farmer et al., 2004). Yet, little

empirical evidence describes rural youth's trajectories of school misbehavior. One study by Karriker-Jaffe et al. (2008) using a rural sample showed that aggression (including school misbehavior) significantly changed over time from age 11 to age 18. The change was characterized by increases in aggression followed by declines. Males reported higher initial levels of physical aggression than females.

While school misbehavior may signal school disengagement, participation in extracurricular activities may reflect school engagement (Mahoney, 2000; Mahoney, Cairns, & Farmer, 2003). Activity participation has been linked to lower likelihood of school dropout, delinquency, and aggression (Linville & Huebner, 2005; Mahoney, 2000; Mahoney & Cairns, 1997). Some non-rural studies have shown that junior high school students participated in more school activities than high school students (Gifford & Dean, 1990) while others show that extracurricular activity participation increases from middle to high school with 38% to 29% non-participation between 7th and 10th grades (Mahoney et al., 2003). Studies with rural youth show similar findings and suggest that rural youth may participate in more activities than urban and suburban youth (Stanley et al., 1998). Seventy-four percent of rural youth participate in afterschool activities (Linville & Huebner, 2005); 48% reported participation at least once a week (Huebner & Mancini, 2003). A scant amount of literature indicates that poor youth do not participate as frequently in extracurricular activities as their non-poor counterparts (McLoyd et al., 2009). Some literature suggests that African American youth participate in more activities (Mahoney & Cairns, 1997) and engage in them more frequently (Huebner & Mancini, 2003) than their White peers. Studies that examine gender differences in activity participation with rural, suburban, and urban youth have mixed findings. Mahoney and colleagues (1997; 2003) found that girls were more likely to participate in extracurricular activities over time than males, but Huebner & Mancini (2003) found no gender differences with rural youth.

Transition to High School

While there are cross-sectional, short-term longitudinal, and a few long-term longitudinal studies that explore changes in educational outcomes for youth, there are fewer studies that explicitly examine the transition to high school and adjustment thereafter. School transitions are a normative and integral part of adolescent development (Barber & Olsen, 2004). As suggested by life course theory and stage-environment fit, the high school transition can be thought of as a critical developmental process (Benner & Graham, 2009; Langenkamp, 2010). Although studied considerably less than the middle school transition (Barber & Olsen, 2004; Benner & Graham, 2009), the high school transition is often described as a disruptive period with academic challenges and increasing academic demands, as well as complex social issues to navigate (Newman, Lohnman, Newman, Myers, & Smith, 2000). Numerous studies have shown the high school transition to be associated with negative outcomes such as achievement declines, lower levels of school belonging, declines in activity participation, lower college aspirations, and increases in school problems (Akos & Galassi, 2004; Barber & Olsen, 2004; Benner & Graham, 2007; Ding, 2008; Gifford & Dean, 1990; Ho, 2009; Newman, Newman, Griffen, O'Connor, & Spas, 2007; Reyes et al., 2000; Roderick, 2003; Seidman, Aber, Allen, & French, 1996; Weiss & Bearman, 2007) that may carry through the high school years (Weiss & Bearman, 2007). Yet, other researchers

have found more favorable associations. Barber & Olsen (2004) found that school misbehavior decreased from 8th to 9th grade. Benner & Graham (2007, 2009) found that school liking increased immediately following the high school transition but declined after 9th grade (2009). They also found that school belonging remained stable following the transition from middle to high school. Many of these relationships are dependent on individual characteristics.

Gender and race impact transition effects (Akos & Galassi, 2004, Benner & Graham, 2007, 2009; Ho, 2009; Roderick, 2003); yet, research findings are mixed. In general, females have more positive school experiences across time than males (Barber & Olsen, 2004; Ho, 2009). Benner and Graham (2007, 2009) showed that girls maintained higher levels of school belonging across the transition to high school than their male counterparts. Others have found that girls performed better academically overall (Roderick, 2003) but had steeper declines in academic performance across the transition than boys (Benner & Graham, 2009). Alternatively, some researchers have shown that boys feel more connected to high school than girls (Akos & Galassi, 2004) or found no gender differences at all (Ding, 2008). In terms of race, African American compared with White youth have been shown to experience poorer adjustment and lower grades following the transition to high school (Benner & Graham, 2007, 2009; Ding, 2008; Murdock, Anderman, & Hodge, 2000), although one study found no race/ethnicity differences in school or academic outcomes (Seidman et al., 1996). These findings illustrate that there are individual differences in school experiences. Such differences may extend to geographical region; however, relatively less is known about rural youth's educational experiences compared with those of urban youth.

Rural Education and Schooling

Approximately 20 percent of American students receive their education in rural schools (Ingels & Scott, 2004). Contrary to popular images of rural populations, small towns and rural areas are becoming more similar to urban environments due to limited economic opportunities (Crockett & Bingham, 2000) and lack of services (Synder & McLaughlin, 2004). Rural poverty rates are similar to or even greater than (Synder & McLaughlin, 2004) the poverty rates in central cities, and economic stress is pronounced in the rural South. Rural minority youth are especially likely to have higher poverty rates than their rural White counterparts (Synder & McLaughlin, 2004). Low-income rural youth are at greater risk for missing more days of school than urban or high-income youth (U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau, 2005). Rural youth are as likely as those in urban areas to experience educational challenges such as narrow curricula, limited resources, and few extracurricular activities (Irvin, et al., 2010; Snyder & McLaughlin, 2004). According to Provasnik et al. (2007), curricular offerings in Advanced Placement or International Baccalaureate classes (which have been associated with college entrance; Poole, 2005) are significantly lower in rural areas than urban or suburban locales. This confluence of factors may impact rural youth's educational outcomes. Using national data, researchers have highlighted differences in youth's educational experiences by geographical location. In general, rural youth fare worse than suburban youth and better than their urban peers on educational indicators. Youth in rural areas (13%) compared with youth in urban areas (11%) are more likely to

repeat a grade (U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau, 2005). The high school dropout rate for 16- to 24- year olds is higher in rural areas (11% in 2004) compared to suburban areas (9%), but lower than in urban areas (13%); differences are exacerbated when examining poverty level (Provasnik et al., 2007). Following a similar pattern, in 2004, the percentage of rural idle teens who were neither working nor enrolled in school was greater than the percent of suburban teens but lower than the percent of urban teens (Provasnick et al, 2007). Provasnik and colleagues (2007) have shown that 42% of rural parents expect their child to attain less than a bachelor's degree compared to 30% and 25% for parents who live in cities or suburban areas, respectively. Further, according to 2004 data, rural youth's college enrollment rates are lower than their suburban or urban counterparts (Provasnik et al., 2007). Given the state of rural education and rural youth's educational outcomes, the current study uses longitudinal data to explore the educational experiences of rural youth from middle to high school to chart their trajectories and examine individual differences in these outcomes.

Study Aims and Hypotheses

While the school experiences of urban youth have received considerable research attention, there is a dearth of literature that explores the schooling experiences of ethnically diverse rural youth (Estell et al., 2007; Farmer et al. 2004; Wettersen et al. 2005). The present study examines the extent to which models of development based on youth living in non-rural areas apply to youth in rural areas. The aims of the current study are two-fold. The first aim is to describe the trajectories of rural youth's grades and their affective and behavioral school outcomes by examining change in grades, school belonging, value of education, school misbehavior, and extracurricular activity participation from 6th to 12th grade. The second aim is to explore the relationships between individual characteristics and these educational trajectories. The study focuses on determining if the high school transition has negative consequences for rural youth.

Several hypotheses are examined, as described below. First, consistent with findings from cross-sectional studies (Perry & McIntire, 2001; Stanley et al., 2008), students' perceptions of school belonging are expected to decrease over time but rebound after the high school transition once youth become more familiar with the school environment, teachers' expectations, and a new network of peers. Second, given most youth's aspirations to continue education after high school (Mello, 2008; Synder, 2010) and the historical increases in rural youth's aspirations (Meece & Farmer, 2009), it is hypothesized that youth's perceptions of the value of education will remain relatively high and stable over time. Even so, and third, self-reported grades are expected to decrease over time because the educational and developmental demands of school increase with each grade, and because academic pressures are heightened in the new school environment that comes with the transition to high school. For similar reasons, and fourth, school misbehavior is expected to increase over time. Fifth, due to the potential increased availability of activities during high school, extracurricular activity participation is expected to increase over time, particularly following the high school transition.

For all trajectories except for school belonging, the trajectory form is expected to be linear (i.e., either steadily decreasing with a negative slope or increasing with a positive slope over time); for school belonging, the shape is expected to be quadratic (i.e., steadily decreasing followed by a stable or steady increase). Based on previous findings that highlight individual differences in education outcomes of rural youth, gender and race/ethnic differences in mean levels of outcomes are expected. Female youth are expected to report more favorable initial levels of all outcomes compared with males (Ho, 2009; Irvin, et al., 2010; Mahoney et al., 2003; Rostosky et al., 2003); African American students are expected to place more value on education (Irvin, 2010; McLoyd et al., 2009) as a possible way to achieve success and to report participation in more school activities than White youth (Mahoney & Cairns, 1997; Huebner & Mancini, 2003).

Method

Study Design

The data for this study were drawn from the Context of Adolescent Substance Use Study (Ennett et al., 2006) and included seven waves of data from adolescents in public schools in two school districts in predominantly rural counties in North Carolina. The study counties are eligible for targeted federal funds for health services due to their rural location and low population density and are classified as nonmetropolitan areas with access to an interstate highway (Ricketts, Johnson-Webb, & Randolph, 1999). The largest cities in the counties have populations that range from approximately 8,700 to 16,000 residents (U.S. Census Bureau, 2010). Reflecting these demographic characteristics, the public schools in the two school districts are classified by the National Center for Education Statistics with the locale codes of either rural: fringe, rural: distant, or town: distant (<http://nces.ed.gov/ccd/districtsearch/>, accessed/10/20/2010). Locale codes are provided individually by school.

The study design included multiple contextual components (i.e., adolescent, parent, and census); however, only data from the adolescent survey are used. The sample included youth from nine schools in the two school districts. The school districts were selected for their proximity to the researchers (i.e., within a 75 mile radius) to accommodate the extensive school based data collection schedules. Within each school district, a census of the schools with the targeted grade levels participated in the study. The schools included four middle schools with 6th – 8th graders, three high schools with 9th – 12th graders, and two alternative schools that included all middle and high school grades. Students did not enter the high schools until wave 2 when the first 8th graders transitioned from middle to high school. Adolescents completed surveys at school, and data collection was timed to coincide with the beginning and end of the academic year for waves 1 through 5. For waves 6 and 7, data collection occurred in the beginning of the academic year.

The institutional review board of the University of North Carolina at Chapel Hill approved all survey protocols. The board approved a waiver of written parental consent. Parents were informed about the study through a letter both mailed and sent home with the child. Parents could refuse their child's participation by returning a postage-paid signed form or by calling a toll-free number. Adolescents provided written assent for participation at school at the time of data collection.

Adolescent Sample and Data Collection

At the initial wave of data collection (i.e., Spring 2002), all adolescents in the 6th – 8th grades were eligible for the study except those in self-contained classrooms for Exceptional Children and those with insufficient English language reading skills to complete the questionnaire. At each subsequent wave of data collection, all adolescents who met eligibility criteria were invited to participate; thus, due primarily to recently enrolled students, new students entered the study at each wave. Approximately 89% of eligible students ($n = 2826$) completed the questionnaires at wave 1, 78% at wave 2, 80% at wave 3, 77% at wave 4, 75% at waves 5 and 6, and 73% at wave 7. Trained data collectors administered the surveys at least two times at each school to account for absenteeism. Adolescents completed the self-administered questionnaire in classrooms or larger group settings (e.g., cafeteria) in approximately one hour. The questionnaires were coded with confidential identifiers but not names. Students put their questionnaires in envelopes before returning them to the data collectors. Teachers stayed in classrooms, at their desks, to help maintain order but did not answer questions about the study.

Analysis Sample

The analysis sample was limited to White and Black/African American youth because there were too few youth of other race/ethnicities for the proposed analyses, resulting in 3,312 unique cases across all seven waves of data collection. The mean self-reported age at wave 1 was 13.18 ($SD = 1.04$). The sample was 50% female and almost equivalently split by grade (cohort) at wave 1 with 36% in 6th grade, 34% in 7th grade, and 30% in 8th grade. Youth were 46% White and 54% African American. Averaged across all seven waves of data collection, approximately 78% of students reported living in a two-parent home, and 55% of students reported the highest level of education for either parent as graduating from college.

As already noted, students could enter the study at any wave of data collection. Of the 3,312 students in the analysis sample, 35% participated in all seven waves of data collection; 44% participated in at least 4 waves of data collection; and 9% participated in only one wave of data collection. Because of the study design, we assessed attrition by comparing adolescents missing at one or more waves with those who were continuously enrolled upon entry to the study. Adolescents with missing data (due primarily to absenteeism at data collection) were significantly more likely to be male, African American, live in single parent households, and have parents with lower education. These youth also placed less importance on education, participated in fewer extracurricular activities, had lower grades, and misbehaved at school more frequently.

Measures

Demographics—All measures were based on adolescents' self reports except for grade at school and county of residence, which were provided by administrative records. Gender was coded with female as the reference group. Race was coded with White as the reference group. Family structure was coded as two parents in the home (reference group) versus some other composition. Parent education, a proxy for SES, was coded as less than high school education, high school graduate or some college, or college graduate (reference group). Grade repetition in school, a control variable, was based on adolescents' responses at each

wave of data collection to the question, “Have you ever had to repeat a grade in school?” and was dummy coded to include ever versus never repeating a grade (reference group).

Educational outcomes—All measures were based on adolescents’ self reports and are categorized as letter grades or affective or behavioral outcomes. Affective outcomes include school belonging and value of education. Behavioral outcomes include school misbehavior and extracurricular participation.

Grades—Adolescents reported their grades (A, B, C, D or lower) at the most recent grading period for English/Language Arts, Mathematics, History/Social Studies, and Science. Responses were averaged across all school subjects, with higher scores indicating higher grades. Cronbach’s alpha range from .79 to .82 across the seven waves of data.

School belonging—Items were drawn from a scale measuring students’ sense of the school as a community (Battistich & Hom, 1997) to measure school belonging. Adolescents reported their agreement with three statements such as “My school is like a family” on a 5-point Likert scale ranging from strongly agree to strongly disagree. Cronbach’s alphas range from .80 to .88 across all seven waves of data. Higher scores indicate greater perceived school belonging.

Value of Education—The value of education was assessed with two items that measured how important “finishing high school” and “going to college” were for the adolescent. Adolescents responded to a 4-point scale ranging from very important to not at all important. The two items were averaged, with higher scores indicating greater value of education.

School Misbehavior—Five items from the Aggression Scale (Farrell et al., 2000) were used to assess the frequency of school-specific delinquency (e.g., skipped school) during the past three months. Response options were on a 5-point scale ranging from none to 10 times or more; higher scores indicate more frequent misbehavior. Cronbach’s alphas range from .70 to .80 across the seven waves of data.

Extracurricular participation—Adolescents reported whether they participated in school activities including sports teams and other clubs ($n = 5$) during the past year. Scores indicate the number of activities the student participated in during the past year.

Results

Data Analysis Plan

As suggested by Bryk and Raudenbush (1992), Hierarchical Linear Modeling (HLM) was used to model the nested structure of the data (time within adolescents). Two-level growth models with time specified at Level 1 and adolescents at Level 2 were estimated. The nesting of adolescents within schools was not included in the models due to the small number of schools and because of the complication of students changing schools over the course of the study. Also, examination of the intraclass correlation coefficients, ratios of between group (i.e., school) variability to the total variability, for the outcome variables

showed that they were relatively small and ranging between .002 and .05. Therefore, the two-level growth model was deemed appropriate.

The cohort sequential design allowed developmental change (i.e., trajectories of educational outcomes) to be modeled over approximately 6 years, corresponding to grades 6 through grades 12, by merging data collected over 3.5 years from three cohorts (6th, 7th, and 8th grade enrollment). Grade was used to measure time. Analyses are reported in stages beginning with descriptive information followed by the estimation of the unconditional models to examine the form of the trajectories (i.e., linear or quadratic). To determine which of these models best approximated the form of the trajectory, the linear and quadratic models were compared using the Bayesian information criterion (BIC) fit statistic. BIC is a penalized model selection criterion that allows for model comparisons among nested and non-nested models; it includes a penalty for the number of parameters in the model; and it is based on theoretical premises rather than an ad hoc statistic (Kuha, 2004). The BIC fit statistic is only provided for the linear models of the value of education and school misbehavior outcomes because the unconditional quadratic models were not interpretable. The G-matrix (estimated covariance parameters) was non-positive definite suggesting that a variance parameter was very small (i.e., close to zero) and that the model needed to be re-specified or simplified (West, Welch, & Galecki, 2007) to a linear model.

Next, the cohort effect was tested by using a likelihood ratio test to compare the unconditional models to models that included a parameter for cohort and grade by cohort interaction. Last the conditional models were examined that included within-person covariates and two-way cross-level interaction terms formed between grade (and grade squared for quadratic models) and the covariates. Significant interactions were probed using online calculators (<http://www.people.ku.edu/~preacher/interact/hlm2.htm>) developed by Preacher, Curran, and Bauer (2006), which provide simple slope estimates for variables under consideration. These online calculators require users to input parameter estimates from the data analysis; these parameter estimates are used to compute simple intercepts, simple slopes, and regions of significance for the interactions. All analyses were conducted using PROC MIXED SAS version 9.2.

Descriptive Information

As seen in Table 1 and Figure 1, on average, students' self-reported grades were between B's and C's and were relatively stable until increasing from 11th to 12th grade. Students' perceptions of school belonging steadily decreased until 10th grade and then increased, although remaining relatively low. Students placed high value on education, with little change throughout middle and high school. Students' reports of school misbehavior were rather infrequent (zero to 1-2 times during past 3 months) but increased until 10th grade and decreased thereafter. On average, youth participated in only one to two school extracurricular activities during the school year. Participation decreased during middle school (grades 6-8) and the transition to high school (9th grade) but then increased from 10th to 12th grade.

Unconditional models

Linear and quadratic models with two random components, intercept and slope, were tested for each outcome. Models were compared using the BIC fit statistic. Smaller values by three or more points suggest better fit (Rafferty, 1995). Based on this criterion, the linear model was a better fit for grades (linear BIC = 30500.4, quadratic BIC = 30502.1), school misbehavior (linear BIC = 24458.9), and the value of education (linear BIC = 16534.6). Quadratic models approximated the data better for participation in extracurricular activities (linear BIC = 52921.6, quadratic BIC = 47431.3) and school belonging (linear BIC = 41048.6, quadratic BIC = 40979.9). The fixed quadratic effect was significant for participation in extracurricular activities ($B = .04$, $SE = .004$, $p < .001$) and school belonging ($B = .02$, $SE = .003$, $p < .001$). For all outcomes, the likelihood tests comparing the unconditional models to models that included the cohort and cohort by grade interaction terms were statistically significant. Therefore, in subsequent analyses, fixed effects for cohort and cohort by grade interactions were included.

Conditional Models

As shown in Table 2, the negative linear effect of grade in school on self-reported grades was significant after adjusting for all other covariates. On average over time, males, African Americans, students whose parents did not complete college, and those who repeated a grade reported lower grades than their counterparts. Initial grades were higher for students who had not repeated a grade as compared to those who had, and the simple slopes showed non-significant declines in self-reported grades over time for students who repeated a grade ($B = -0.004$, $SE = .015$, $p = ns$) as compared to significant declines in grades over time for students who did not repeat a grade ($B = -0.038$, $SE = .012$, $p = .001$).

The positive linear effect of grade in school on school misbehavior was significant after adjusting for all other covariates (see Table 2). African American students and those who had repeated a grade reported higher initial level of school misbehavior than white youth and those who had not repeated a grade. Simple slope analyses indicated that the rate of increase in school misbehavior was greater for White youth ($B = 0.05$, $SE = .009$, $p < .001$) as compared to African American youth ($B = 0.015$, $SE = .008$, $p = .055$). Simple slope analyses also indicated that rate of increase in school misbehavior was greater for males ($B = 0.068$, $SE = .001$, $p < .001$) and youth from other than two-parent homes ($B = 0.081$, $SE = .011$, $p < .001$) as compared to females ($B = 0.05$, $SE = .009$, $p = .001$) and youth from two-parent homes ($B = 0.05$, $SE = .009$, $p < .001$).

The positive quadratic effect of grade on extracurricular activities' participation was significant after adjusting for all covariates (see Table 2) suggesting declines then increases in activity participation from middle to high school. On average, males and students whose parents did not graduate from college participated in fewer activities than their peers. Simple slope analyses indicated that over time, African American youth ($B = -0.37$, $SE = .05$, $p < .001$) participated in fewer activities than their White peers ($B = -0.26$, $SE = .06$, $p < .001$).

For the affective educational outcomes, on average, students' perceptions of the value of education remained stable over time. African American students perceived education to be

significantly more important than White students. Males, students from single parent homes, those with parents who did not complete college, and those who repeated a grade placed less value on education than their counterparts. With respect to perceptions of school belonging, the positive quadratic effect of grade was significant after adjusting for all covariates suggesting that perceived school belonging decreases then increases from middle to high school. Students from non-two-parent homes reported lower levels of school belonging than their counterparts. Simple slope analyses showed that females' connection to school decreased over time ($B = -0.17, SE = .05, p = .001$), but males' self-reported levels of connection was relatively stable over time ($B = 0.01, SE = .005, p = ns$).

Discussion

The normative school transition from middle to high school is less studied than the transition from elementary to middle school (Barber & Olsen, 2004; Benner & Graham, 2007). Yet, the available literature and both life course (Elder, 1993) and stage-environment fit (Eccles et al., 1993) theories suggest that the high school transition may be a difficult developmental period characterized by disruption in social networks (Weiss & Bearman, 2007), academic challenges (Benner & Graham, 2009), and declines in school engagement and performance (Mahoney et al., 2005; Seidman et al., 1996). At the same time, the high school transition offers the potential for positive changes such as new opportunities for extracurricular involvement and the possibility of friendships with more like-minded peers (Sussman, Pokhrel, Ashmore, & Brown, 2006). The period from 9th through 12 grades also offers the potential for equilibrium or rebounding after the turning point of the high school transition.

This study examined trajectories of several educational outcomes (i.e., grades, school belonging, value of education, school misbehavior, extracurricular activity participation) for rural youth over the course of middle and high school, as well as explored individual differences in these trajectories by gender, race, and SES. Overall, the findings revealed significant variation in the educational outcomes over time, except for the value students placed on education. In addition, the results showed individual differences in these educational trajectories similar to those discussed in the literature using cross-sectional studies. Last, some patterns of educational experiences were similar to relationships found with non-rural samples, but differences did emerge.

Across time, the rural students' reports of school belonging declined during middle school and across the transition to high school, then increased during 12th grade. These results add to a mixed literature on geographic differences in levels of school attachment over time. A large, national study found no difference in levels of school belonging by geographic region. Yet, the pattern found in the present study is similar to cross-sectional findings reported using rural (Stanley et al., 2008) and suburban (Newman et al., 2007) youth, but inconsistent with the findings reported for non-rural youth (Akos & Galassi, 2004; Benner & Graham, 2009). Akos & Galassi (2008) reported a positive connection to school after the high school transition. Relatedly, Benner & Graham (2009) explained that urban youth's reports of school belonging increased across middle school with no immediate change thereafter. The mixed pattern of findings may suggest that differences in schools other than those associated with geography may be more salient to students' sense of school belonging.

On average, the rural youth in the present study participated in one to two activities from middle to high school. Almost one-third of 6th and 12th graders participated in no extracurricular activities. Mahoney & Cairns (1997) showed that during middle school only 8% of boys and 13% of girls participated in more than one extracurricular activity, but the rates of involvement substantially increased in high school with 48% of boys and 65% of girls participating in more than one activity. For the rural youth in the present study, extracurricular activity participation steadily declined preceding the high school transition but increased immediately following it. This pattern of findings may reflect the disruption of social networks (Weiss & Bearman, 2007; Barber & Olsen, 2004) during the transition to high school. However, it may be plausible to assume that after youth become more familiar with the new surroundings and have an opportunity to make new friends, their perceptions of the school improve and participation in extracurricular activity increases because of the status associated with extracurricular involvement (Mahoney & Cairns, 1997) or the opportunities for interactions with peers.

Interactions with peers may also increase misbehavior. On average, participation in deviant acts at school increased over time with only 36% of 6th graders as compared to 61% of 12th graders reporting some form of school misbehavior. With predominantly White rural youth, Swaim and colleagues (2006) reported prevalence rates of past-month aggressive behavior and found that 14% of 7th and 8th grade students fought; 68% of students verbally harassed a fellow student; and 33% of students had been physically aggressive. Similar to Karriker-Jaffe et al. (2008) who found that physical and social aggression reached a tipping point between the ages of 14 and 15 years old, this study showed that school misbehavior peaked between 9th and 10th grade. This finding is also consistent with Cillenssen's and Mayeux's finding that student aggression or problem behaviors increase across the transition (2007). This peak may capture the disruption and academic and social challenges of the high school transition as well as increased opportunities for involvement with deviant peers (Huebner & Manicini, 2003). Despite this peak at the transition, these rural youth were rather infrequent in their transgressions, which may suggest overall positive adaptation.

While there were improvements after the high school transition for perceived school belonging and extracurricular participation, self-reported grades and the value of education remained fairly stable. However, there was a subsequent increase in self-reported grades in 12th grade. Compared to Ding (2008) who showed an increase in grade point average during 10th grade with suburban youth, the rebound in grades for these rural youth was delayed. Perhaps the closer they came to college entry, the more they focused on their studies and their grades improved. An alternative explanation is that the finding is spurious due to the effect of students' dropping out: for school districts in this study, youth could legally withdraw from school at the age of 16. It is possible that those students who remained in school and did not dropout had higher mean levels of grades from middle to high school than their counterparts who did decide to leave school.

Similar to other studies, results revealed that youth placed high value on education and remained stable in their perceptions (Synder, 2010). If indeed these youth value education, aspire, and expect to go on to college, they may face a new transition to a new place with new people and encounter another potential "turning point" at entry to college (Elder, 1998)

and further disruption in their transition to adulthood. However, it may be that these aspirations are not attained. According to Poole (2005) and Meece and Farmer (2009), rural youth face several potential barriers to college attainment such as fewer school resources to prepare them for the transition to college, the relative costs associated with higher education, less contact with college-educated role models, and constrained labor markets. Provasnik and colleagues (2007) report that college enrollment and completion rates of rural youth tend to be lower than their counterparts. Given this potential for risk, it is imperative that researchers identify ways to enhance and promote well-being during the transition from adolescence to emerging adulthood.

Taken together, these findings highlight both stability and change in rural youth's educational experiences preceding, during, and after the high school transition. Connection, autonomy, and regulation are all important needs during adolescence and, particularly, during normative transitions (Barber & Olsen, 2004). This study shows similarities between rural and urban youth's educational outcomes and that despite some turbulence from middle to high school, there appears to be some calm after the storm. However, this change may vary by individual.

Individual Differences

Similar to previous studies, race, gender, and SES differences were found for these rural youth. In general, females had more positive experiences from middle to high school. They were more connected, had higher grades, participated in more school activities, and engaged in deviant acts less frequently. African American youth placed more value on education than White youth, which is consistent with previous research that shows minority youth have higher educational aspirations and expectations compared with non-minority youth (Irvin et al., 2010, & Mello, 2009). Contrary to our hypothesis, these African American youth reported participating in fewer extracurricular activities over time than White youth. Mahoney & Cairns (1997) found that 9th grade African Americans participated in more school activities, but there were differences by domain such that African American students participated in more sports and White youth participated in more leadership activities (e.g., student government). The present study did not include activity involvement by domain, which may mask underlying differences in participation. An alternative explanation is that there may be costs associated with activity participation. McLoyd et al. (2009) assert that poor youth participate in fewer extracurricular activities and Synder & McLaughlin (2004) suggest that rural poverty rates are higher than other geographic regions in the U.S. and that rural African American youth may be among the poorest. Taken together, one could conjecture that rural African American poor youth may not be able to participate in multiple activities due to the costs and economic stress associated with such participation. Further, as these youth age, there may be less time for extracurricular involvement if they become involved in the world of work (McLoyd, Kaplan, & Purtell, in press) to earn their own money or assist with their families' economic needs.

Although this study did not include a comprehensive measure of SES, it did provide indication that parents' educational attainment, as reported by youth, is relevant to youth's educational outcomes. Youth's whose parents did not complete college had less favorable

outcomes (i.e., lower grades, participated in fewer activities, and placed less value on education) over time, compared to those whose parents completed higher levels of education. These findings suggest that SES may be related to adolescent outcomes, but the question becomes whether SES makes a unique contribution to adolescent outcomes or whether it works in concert with other developmental processes (McLoyd et al., 2009). Future studies should use more refined measurement of poverty and SES. Parent's reports of education, occupation types, and needs-to-income ratios may be more effective ways to capture SES and variations in it (Hill & Witherspoon, in press).

Limitations and Implications for Future Work

Although our study extends the literature base on rural adolescents' development, there are limitations. A primary limitation is monomethod bias with the use of only a single reporter, adolescents, which may introduce bias avoided with multiple informants or sources of information. Xie, Mahoney, & Cairns (1999) show that teacher ratings of student academic competence have greater predictive validity (i.e., were better predictors of later academic outcomes such as college matriculation and drop out) than students' self ratings of future outcomes. Further, students' reports of academic competence were found to be exaggerated. However, in general, teacher and student ratings of academic competence are positively and significantly correlated, and self ratings can approximate the predictive validity of teacher ratings. Future studies would benefit from multiple reports of the youth's experiences, particularly for outcomes such as academic performance and school misbehavior to eliminate bias and enhance validity. For such outcomes, teacher reports, standardized tests, and administrative school records could be used.

A second limitation is the inclusion of only African American and White adolescents. The sample sizes for other racial groups were too small for use in the statistical analyses of individual difference. Thus, the sample does not reflect the full diversity of the two counties in the study, especially given the growth in Hispanic residents. Since 2000, the counties have experienced approximately 50% Hispanic population growth (Pew Hispanic Center, 2010). Hispanic youth are more likely to drop out of school than White or African American youth (Pew Research Center, 2009) and may differ on the outcomes examined in the current study.

Last, the current study described the trajectories of several educational outcomes for rural youth in general and by socio-demographic characteristics but did not examine explanations for the trajectories. Future studies should move beyond description to explanation by including within-person change and by examining how contextual characteristics such as school ethnic composition (Benner & Graham, 2007) and neighborhood characteristics (Mello & Swanson, 2007) may shape trajectories. Additional research is needed to unpack race and gender differences, such as by including perceptions of discrimination and identity.

Despite these caveats, this study offers an initial step in describing the trajectories of rural youth's educational outcomes. Findings suggest that the transition to high school caused some disruption in rural adolescents' lives, but the changes were both positive and negative. These results underscore important aspects of life course theory and stage environment fit for rural youth. The results further suggest that the trajectories for several of the educational

outcomes for these rural youth were similar to those described in research on urban youth. Yet, youth in both rural and urban schools may face obstacles not experienced by youth in more affluent suburban schools. Rural youth's educational outcomes, especially those related to post-secondary education, look qualitatively different from that of suburban youth due to a lack of school resources, less access to college-educated role models, enhanced connection to place, or feelings of self-doubt (Poole, 2005). Continued investigation of the educational experiences of rural youth in comparison to both urban and suburban youth is warranted.

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Author Biographies

Susan T. Ennett, PhD Brief Biosketch

Susan T. Ennett is Professor and Doctoral Program Director in the Department of Health Behavior and Health Education, Gillings School of Global Public Health, University of North Carolina at Chapel Hill. Dr. Ennett's research focuses on the etiology and prevention of health risk behaviors among adolescents in both the general population and high-risk subgroups. Her primary behavioral focus is youth tobacco, alcohol, and other drug use; she also researches youth violence and dating violence and risky sexual behavior. She focuses on how social contexts, including family, peers, schools, and neighborhoods, interrelate as risk and protective factors for health risk behaviors over the course of adolescence. She is particularly interested in application of social network methods to study the peer context, including use of network methods to measure peer relationships and to facilitate investigation of how peer processes, such as peer influence and peer selection, contribute to homogeneity of adolescent behavior. An additional area of her research concerns evaluation of youth substance use prevention programs, including family and school programs.

Dawn Witherspoon, Ph.D. Brief Biosketch

Dawn Witherspoon, Ph.D. is an Assistant Professor in the Department of Psychology, Developmental Area, at The Pennsylvania State University. Prior to her current appointment, Dr. Witherspoon completed a post-doctoral fellowship at the University of North Carolina at Chapel Hill's Center for Developmental Science and in the Department of Psychology's Black Child Training Grant Program. Dr. Witherspoon received her doctorate in Community Psychology from New York University and her Bachelor's degrees in Psychology and English from North Carolina Central University. Broadly, her research focuses on the ways in which urban and rural families and youth are influenced by the contexts in which they are embedded, particularly focusing on how neighborhood, school, and family factors affect adolescent's academic, psycho-social, and behavioral well-being. The crux of her research focuses on the neighborhood context and its relation to other proximal contexts for adolescents and identifies positive characteristics in multiple contexts

that are related to adolescent well-being. In addition, Dr. Witherspoon, examines the mechanisms (e.g., racial socialization and identity) by which race and/or ethnicity influence development in these various contexts. Dr. Witherspoon uses both quantitative and qualitative methods to examine her research questions with racially and socioeconomically diverse families.

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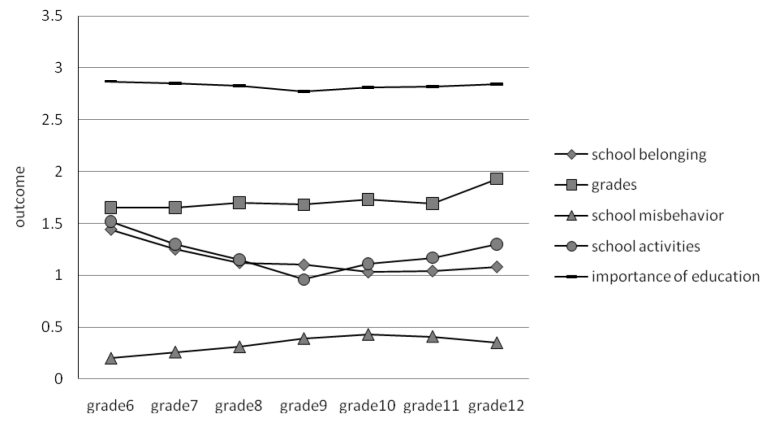


Figure 1. Unconditional trajectories of rural youth’s educational outcomes

Table 1

Descriptive Information about Rural Youth's Educational Outcomes over Time (N=3,312)

Variable	Mean (standard deviation)											
	6 th grade	7 th grade	8 th grade	9 th grade	10 th grade	11 th grade	12 th grade					
Belonging	1.44 (1.21)	1.25 (1.14)	1.12 (1.09)	1.10 (1.10)	1.03 (1.08)	1.04 (1.07)	1.08 (1.04)					
Value of Education	2.87 (0.38)	2.85 (0.44)	2.83 (0.48)	2.77 (0.54)	2.81 (0.48)	2.82 (0.47)	2.84 (0.42)					
Grades	1.65 (0.83)	1.65 (0.84)	1.70 (0.87)	1.68 (0.84)	1.72 (0.85)	1.69 (0.84)	1.93 (0.77)					
Misbehavior	0.19 (0.42)	0.26 (0.52)	0.31 (0.56)	0.39 (0.67)	0.43 (0.67)	0.41 (0.61)	0.35 (0.51)					
Activities	1.52 (1.42)	1.30 (1.24)	1.15 (1.15)	0.96 (1.14)	1.11 (1.18)	1.17 (1.20)	1.30 (1.19)					

Note. Due to the cohort sequential design of the study, data are collapsed across waves and cohorts as applicable at each grade level, resulting in varying sample sizes.

Table 2

Multilevel Models of Rural Youth's Educational Outcomes Fixed Effects (N=3,312)

Variable	Parameter Estimates and P-values				
	Belonging	Extracurricular Activities	Grades	Value of Education	School Misbehavior
Intercept	1.15 (.11)***	1.49 (.12)***	2.22 (.05)***	2.95 (.03)***	.09 (.02)***
Grade	-.21 (.07)**	-.32 (.08)***	-.04 (.02)*	0 (.01)	.05 (.01)***
Quadratic	.04 (.01)**	.07 (.01)***	—	—	—
Cohort	-.002 (.05)	.22 (.06)***	-.005 (.02)	-.01 (.01)	.03 (.01)***
Grade * cohort	.004 (.03)	-.01 (.03)	.003 (.006)	.002 (.004)	-.01 (.002)**
Quadratic * cohort	-.006 (.005)	-.005 (.006)	—	—	—
Male	-.09 (.06)	-.26 (.07)***	-.19 (.03)***	-.04 (.02)*	-.01 (.01)
Black	.13 (.07) †	.14 (.07) †	-.24 (.04)***	.07 (.02)***	.04 (.01)**
One parent	-.17 (.08)*	-.03 (.08)	-.06 (.04)	-.07 (.02)**	.01 (.01)
Some college	0 (.08)	-.34 (.07)***	-.26 (.03)***	-.08 (.02)***	.01 (.01)
Less than HS	.08 (.14)	-.38 (.15)*	-.42 (.07)***	-.12 (.04)**	-.02 (.03)
Repeat grade	.11 (.07)	-.02 (.08)	-.49 (.04)***	-.10 (.02)***	.06 (.01)***
County	.55 (.07)***	.17 (.07)*	.04 (.03)	.01 (.02)	-.05 (.01)***
GR * Male	.19 (.04)***	.05 (.05)	.02 (.01) †	-.01 (.006) †	.01 (.004)*
GR * Black	.03 (.05)	-.12 (.05)*	-.007 (.01)	.01 (.01)	-.02 (.004)***
GR * One parent	.03 (.05)	0 (.06)	-.007 (.01)	-.02 (.01)*	.01 (.005)**
GR * Some	-.006 (.04)	.05 (.04)	.006 (.01)	-.01 (.01)	-.006 (.004)
GR * LTHS	-.01 (.10)	-.01 (.11)	.01 (.02)	-.02 (.01)	-.02 (.02) †
GR * Repeat	-.01 (.05)	-.10 (.05) †	.03 (.01)**	-.04 (.01)***	.002 (.004)
GR * County	-.23 (.05)***	-.07 (.05)***	-.01 (.01)	-.02 (.01)**	.01 (.004) †
MODEL FIT					
BIC	39032.9	44620.5	28516.9	15184.0	4268.0

Note: Linear models do not include estimates for parameter estimates that include a quadratic term. Estimates of the random effects for the quadratic term and the fixed effect interaction terms that include the quadratic are not provided in this table. For parameter estimates of the full complete, please contact the author.

† p < .10,

* p .05,

** p .01,

*** p .001