Changes in Academic Adjustment and Relational Self-worth Across the Transition to Middle School

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Abstract Moving from elementary to middle school is a
time of great transition for many early adolescents. The
present study examined students' academic adjustment and
relational self-worth at 6-month intervals for four time points
spanning the transition from elementary school to middle
school ($N = 738$ at time 1; 53 % girls; 54 % African American, 46 % European American). Grade point average
(G.P.A.), intrinsic value for schoolwork, self-worth around
teachers, and self-worth around friends were examined at
every time point. The overall developmental trajectory indicated that G.P.A. and intrinsic value for schoolwork declined.
The overall decline in G.P.A. was due to changes at the
transition and across the first year in middle school. Intrinsic
value declined across all time points. Self-worth around
teachers was stable. The developmental trends were the same
regardless of gender or ethnicity except for self-worth around
friends, which was stable for European American students and
increased for African American students due to an ascent at
the transition into middle school. Implications for the education of early adolescents in middle schools are discussed.

Introduction

Early adolescence is widely characterized as a challenging
time for youth. The downward trend in adjustment that

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occurs for many children during this stage of life has been a
long-standing problem (Finger and Silverman 1966; Anderman and Maehr 1994; Juvonen et al. 2004). Many
scholars have focused on the transition to middle school as
an impetus for maladjustment during this stage of life
(Rudolph et al. 2001; Seidman et al. 1994; Simmons and
Blyth 1987). The transition to middle school involves great
change and new demands. Students must find their way
around a larger building and are on a more rigid time
schedule. Students shift from being the oldest in elementary school to the youngest in middle school. Social networks are disrupted and students need to make new friends
in a larger social setting. Further, students must coordinate
the varied styles and demands of multiple teachers as they
rotate about different teachers throughout the day. These
changes in school context are often at odds with the cognitive, physical and social changes of early adolescence
that make supportive peer and teacher relationships especially important at this stage of life (Eccles et al. 1993).
Much theory and research indicate that this "mismatch"
between the nature of the middle school context and the
needs of early adolescents contributes to maladjustment
during this time (Eccles 2004).

However, extant research does not provide a comprehensive understanding of the nature and extent to which the
middle school transition begets adjustment problems. First,
the bulk of middle school transition studies have relied on
two time points designs (i.e., pre-post designs), which
provides only a limited view of development during this
stage and cannot disentangle within and between school
year changes. Second, the vast amount of research on
primarily European American students leaves knowledge
of African American students' adjustment to middle school
less well understood. Third, research on the transition to
middle school received much more attention in previous

decades (i.e., the 1980's) than recently. Inconsistencies in this existing literature as well as changes in school practices due to middle school reform in more recent decades warrant a fresh examination. With the goal of advancing knowledge on development during the transition to middle school, the present study examined changes in students' academic adjustment and self-worth with a longitudinal design that included four time points (fall and spring in the years before and after the transition) in a sample that is approximately half European American and half African American. For academic adjustment, we examined report card grades and intrinsic value for schoolwork. In regards to self-worth, we examined relational self-worth around teachers and friends. Our examination of different facets of relational self-worth during the middle school transition is in line with contemporary perspectives that emphasize the multi-dimensional nature of the self (Harter 2012) and research showing that students feel differently about themselves in different relationships (Harter et al. 1998). As the transition to middle school brings about many changes that affect students' relationships with teachers and friends, distinguishing self-worth in these relationships should be informative about adjustment during this stage of life.

Assessing Change Across the Transition to Middle School

Most transition studies have examined changes between two time points (e.g., Anderman and Midgley 1997; Harter et al. 1992; Midgley and Feldlaufer 1987; Rudolph et al. 2001; Simmons and Blyth 1987; Simmons et al. 1991; Seidman et al. 1994). Analyzing change across two points in time provides a limited understanding of development as at least three time points are needed to document a trend (Rogosa 1988). Further, studies that assess adjustment at one point in different grades cannot disentangle within- and between-year changes. Multiple time points at each grade make it possible to examine if documented changes began prior to the transition (i.e., fall to spring in elementary school), occur at the beginning of middle school (i.e., spring to fall across the transition) or unfold during the first year in middle school (fall to spring in middle school). The present study will estimate growth trajectories to examine the overall trend in development across the four time points as well as investigate the within- and between-year patterns of change that contribute to any documented trends.

Changes in Academic Adjustment Across the Transition to Middle School

The transition to middle school has been found to influence academic adjustment negatively for both boys and girls (Kurtz-Costes and Rowley 2012). Declines have been documented on a range of indicators of academic adjustment, including academic self-concept (e.g., Wigfield et al. 1991), interest and intrinsic motivation (e.g., Harter 1981), classroom engagement (e.g., Skinner et al. 1998) and achievement (e.g., Rudolph et al. 2001; Simmons and Blyth, 1987). As noted in a recent review on the middle school transition and academic adjustment, most research has been on European American samples (Kurtz-Costes and Rowley 2012). However, the more limited research on African American samples indicates similar declines in academic adjustment (Seidman et al. 1994; Simmons et al. 1991). Consistent with these patterns, we anticipate declines in academic adjustment (report card grades and intrinsic value). Since most research has assessed academic adjustment at one point in different grades, we add to this literature by examining whether changes in academic adjustment are in progress prior to the transition, occur as students move into middle school and/or unfold across the first year in middle school. This is important because knowledge about when declines happen can inform the timing of interventions and educational practices aimed at supporting motivation and achievement.

Changes in Self-worth Across the Transition to Middle School

Global self-worth or self-esteem has been a key focus in the middle school transition literature. Self-worth refers to the level of regard individuals have for themselves as a person and is viewed as an important outcome in its own right, given that it is an essential component of mental health that is associated intricately with how people think, feel and behave (Harter 2012; Kling et al. 1999). Self-worth is especially important during early adolescence when students are faced with the developmental task of forming a positive self-identity. During the schooling years, students receive feedback about how well they perform in a variety of domains as compared to their peers, which makes their self-appraisals vulnerable to changes in school contexts. Evidence regarding middle school transition effects on changes in self-worth and self-esteem is inconsistent. Research has found declines in self-worth and self-esteem for students when they transition into middle school (e.g., Blyth et al. 1983; Wigfield et al. 1991). However, other studies have found no change in self-worth (e.g., Crockett et al. 1989; Harter et al. 1992) or even increases in self-worth (e.g., Schulenberg et al. 1984).

Layered upon the inconsistent findings of whether self-worth changes across the transition to middle school is inconsistency in whether there are gender and ethnic differences in such patterns. Some studies suggest that girls' (especially European American girls') self-worth may be more vulnerable than boys' (e.g., Simmons and Blyth

1987) and that European American girls often have increased insecurities about their abilities and declining self-esteem in comparison to European American boys as well as African American boys and girls (e.g., AAUW 1991; Greene and Way 2005), but other research finds no gender differences (e.g., Harter et al. 1992). Regarding ethnic differences, some research suggests that African Americans' self-worth is stable across the transition (Simmons et al. 1991) but other research shows declines (Seidman et al. 1994). The limited autonomy of African American adolescents due to racism and negative stereotypes in our society (Graham et al. 1998) could contribute to decreasing self-worth during adolescence; however, there is the potential for declining achievement in tandem with stable or increasing self-worth among African American students (the "achievement-esteem paradox", see Rowley et al. 2011). Finally, the inconsistencies within research on changes in self-worth may be attributed to the over-reliance on two-time point designs. Research that assessed students in the fall and spring of the first year in middle school found that students' self-worth improved during this time (Nottelmann 1987; Wigfield et al. 1991).

Research to date on the middle school transition and changes in self-worth has examined global indices of self-worth (Seidman et al. 1994) or made distinctions in regards to academic or social self-concept (Wigfield et al. 1991). However, individuals' sense of self-worth also varies by relational context (Harter 2012). People feel differently about themselves in reference to different types of relationships. This perspective is especially relevant in early adolescence when individuals' self-descriptions vary across different roles, for example with parents, teachers, friends and romantic partners (Griffin et al. 1981; Harter et al. 1998). The idea that one's self-perceptions are constructed within relationships with others has roots in classic works on the self, for example, Cooley's looking glass self (1902). With this rationale, Harter and her colleagues (Harter et al. 1998) created a measure that adapted her global self-worth items to be specific to adolescents' self-regard in different relational contexts. Factor analysis supported their idea that relational self-worth is distinct in different relational contexts. Self-worth in different relational contexts was associated with perceived support in the corresponding relational context. In the present study, when examining changes in self-worth, we examine the distinction between two salient relationships that are subject to much change as students move from elementary to middle school: teachers and friends.

Changes in Teacher-Student Relationships: Implications for Relational Self-worth Around Teachers

In middle school, students must navigate different teachers for different subjects and coordinate the new expectations and workload from these teachers. Teacher-student relationships change in many ways from elementary to middle school. Previous literature suggests that in middle school classrooms, as compared to elementary classrooms, teachers are more controlling and provide fewer opportunities for choice (Midgley and Feldlaufer 1987), are less friendly, caring and supportive (e.g., Feldlaufer et al. 1988; Midgley et al. 1989), and emphasize relative ability amongst students more than personal improvement and challenge (e.g., Midgley et al. 1995). Eccles et al. (1993) and Midgley (2002) suggest these patterns are caused by the large and bureaucratic nature of middle schools. Due to having many more students for shorter time periods throughout the day, it is harder for teachers to have warm and positive relationships with all their students and engage them in personally relevant and challenging tasks. Because they supervise so many more students, middle school teachers may resort to controlling strategies more often than elementary school teachers. This research suggests that students' relational self-worth around teachers will decline.

Changes in Peer Relationships: Implications for Relational Self-worth Around Friends

When students move to middle school they move to a larger school, join a social scene in which they are the youngest members, and have different peers across class periods. Students' social networks are disrupted and they are unlikely to be with their elementary school friends as often during the course of the day at middle school. Such changes are theorized to be stressful for children as it is likely harder to maintain and form high quality friendships under such circumstances (Eccles et al. 1993). However, there is little longitudinal evidence that friendship quality or support from friends deteriorate as students move from elementary to middle school. Lynch and Cicchetti (1997) found an increase in students' reports of positive relationship qualities with peers from elementary to middle school. Seidman et al. (1994) found no changes in perceived support from best friends for European American and African American students. Hirsch and Rapkin (1987) found no changes in perceived support from friends for European American students and an increase for African American students. This research suggests that students' relational self-worth around friends will be stable or increasing.

Overview of Current Study

The overall aim of the current study is to advance the understanding of changes in adjustment across the transition to middle school. Our sample is approximately half African American and half European American youth who

made the transition from elementary to middle school after sixth grade. We examine academic adjustment (report card grades and intrinsic value for schoolwork) and relational self-worth (around teachers and friends). Our focus is on developmental trends during the transition to middle school and examining the extent to which change is happening pre-transition (from time 1 to time 2 during elementary school), during the transition (from time 2 to time 3 when students move from elementary to middle school) and post-transition (from time 3 to time 4 when students are in middle school). Given that middle school transition research has less often included African American students, we explore variations in the initial levels and developmental trajectories of European American and African American students. Examining ethnic and gender differences across four points in time will be informative about the strength and consistency of group differences in academic adjustment and relational self-worth across the transition to middle school.

Methods

Schools

The data are from the University of Illinois Adolescent Transitions Project, which was a 2 year longitudinal study that examined changes in academic and social adjustment across the transition to middle school. Participants attended one of 15 elementary schools in sixth grade and moved into one of three middle schools in seventh grade. In middle school, students were assigned to an advisory teacher and an interdisciplinary team of teachers within their grade cohort. The elementary schools had an average of 50 % African American students, 46 % European American students and 4 % from other ethnic groups. The middle schools had an average of 48 % African American students, 48 % European American students and 4 % from other ethnic groups. The average rate of eligibility for free or reduced-fee lunch was 66 % across the elementary schools and 59 % across the middle schools.

Procedure

Students took home letters about the study to their parents 2 weeks prior to each data collection. We maximized the sample size by recruiting new students at each wave. If parents did not want their children to participate in the study, they were instructed to have their child return an attached form to the teacher, call the school, or call the researchers at the university number provided on the letter. Teachers had two copies of the letter for each student and teachers checked with students that the letters were delivered home. Less than 5 % of the parents declined to have their child participate at any wave.

Students completed surveys in their classrooms. Researchers told students that the purpose of the survey was to find out about students' beliefs and behaviors and that the survey was not a test and that there were no right or wrong answers. Researchers told students that information in the survey would be kept confidential and that filling out the survey was voluntary. We visited the schools one additional day to administer make-ups for students who were absent for survey administration.

Participants

Students who were not African American or European American were dropped because there were so few that it was not possible to analyze ethnic differences for these students. At the first wave of data collection, 738 students completed surveys. At subsequent time points, we lost some students from our sample (88, 182, and 110, at times 2, 3, and 4, respectively) and gained some new students (110, 280, and 40, at times 2, 3, and 4, respectively). Sample instability was due to two factors: school participation and mobility rates. Regarding school participation, we lost some students who went to a nonparticipating middle school and gained some students from nonparticipating elementary schools. After these students were accounted for, the sample instability was comparable with the mobility rates reported by the state for these schools. One of the strengths of multi-level modeling is its flexibility in dealing with missing data (Raudenbush and Bryk 2002). In multilevel models, participants do not have to have complete data. The terms in multilevel model equations are estimated using maximum likelihood in conjunction with iterative algorithms to solve the likelihood equation. Such flexibility of multilevel models allowed us to include all students with at least one time point of data in the analyses.

Measures

Grade Point Average

Students' semester grades in Reading, Math, Science, English and Social Studies were collected from their school records. The grades were coded F = 1 through A + = 13. Overall G.P.A. was computed by taking the mean of the five subject grades.

Intrinsic Value for Schoolwork

We used an established measure of intrinsic value developed by Eccles (1983; see also Fredricks and Eccles 2002;

Watt 2004). Intrinsic value refers to adolescents' interest and enjoyment in their schoolwork. A sample item is "How much do you like doing schoolwork?" (response scale 1 = a little to 5 = a lot). Another sample item is "In general, I find working on school assignments…" (response scale 1 = very boring, 3 = o.k. and 5 = very interesting). This 3-item scale was reliable in the present sample. The Cronbach's alpha was .74, .77, .74, and .78 at waves 1–4, respectively.

Self-worth Around Teachers and Friends

We used Harter's measure that distinguishes self-worth in different relational contexts (Harter et al. 1998). For this study, we assessed self-worth around the teacher and self-worth around close friends. Sample items for self-worth around teachers are "I'm happy with the way I am around my teachers" and "I am disappointed with myself around my teachers" (reverse scored). Sample items for self-worth around close friends are "I'm happy with the way I am around my close friends" and "I am disappointed with myself around my close friends" (reverse scored). Harter uses a 4-point rating scale but to be consistent with the rest of our survey students rated these items on a five-point scale (1 = not at all true of me through 5 = very true of me). Each of these scales had five items and all were found to be reliable in the present sample. The Cronbach's alpha for self-worth around teachers was .72, .75, .76, and .82 at waves 1–4, respectively. The Cronbach's alpha for self-worth around friends was .73, .73, .81, and .84 at waves 1–4, respectively.

Results

Analysis Plan

Descriptive statistics for all adjustment variables across the four waves are presented in Tables 1 and 2. Multilevel models (Raudenbush and Bryk 2002; Singer and Willett 2003) were used to estimate individual growth curves. We used HLM (PROC MIXED procedure in SAS v. 9.1 with Maximum likelihood) to estimate our growth trajectories.

To estimate the general trend of the development of the different facets of adjustment, four separate growth curve models were estimated with each construct as an outcome variable. Results from these unconditional growth models are summarized in Table 3. The fixed-effects coefficients for the intercepts indicate the average initial levels at time 1 (Fall of sixth grade). The fixed-effects coefficients for the slopes indicate the average rate of change across the four time points.

Once significant individual variability in both the initial levels and rates of changes was identified, we proceeded to

Table 1 Means and standard deviations by gender and ethnicity

| Variable | Wave 1 | | | | Wave 2 | | | | Wave 3 | | | | Wave 4 | | | |
| | Boys | | Girls | | Boys | | Girls | | Boys | | Girls | | Boys | | Girls | |
	EA	AA	EA	AA	EA	AA	EA	AA	EA	AA	EA	AA	EA	AA	EA	AA
G.P.A.	8.86	6.07	9.24	7.44	8.86	6.37	9.36	7.47	7.47	5.03	8.33	6.15	7.21	4.46	7.73	5.78
	(2.46)	(2.45)	(2.42)	(2.47)	(2.41)	(2.46)	(2.23)	(2.40)	(3.05)	(2.40)	(3.16)	(2.80)	(3.00)	(2.36)	(3.12)	(2.89)
Intrinsic value	2.66	2.95	3.13	3.18	2.37	2.80	2.89	2.95	2.55	2.70	2.78	2.89	2.41	2.80	2.63	2.83
	(1.04)	(.97)	(.95)	(1.00)	(1.00)	(1.08)	(.95)	(1.00)	(1.02)	(1.02)	(.94)	(.95)	(.89)	(.94)	(.91)	(.96)
Self-worth around teachers	3.82	3.58	3.97	3.94	3.73	3.59	3.91	3.90	3.90	3.64	4.11	4.06	3.86	3.68	3.98	4.04
	(.99)	(.99)	(.84)	(.96)	(.95)	(.99)	(.83)	(.94)	(.91)	(1.02)	(.80)	(.89)	(.90)	(1.03)	(.87)	(.95)
Self-worth around friends	4.28	4.21	4.39	4.36	4.28	4.30	4.29	4.28	4.28	4.33	4.46	4.47	4.15	4.26	4.39	4.44
	(.76)	(.81)	(.67)	(.65)	(.79)	(.75)	(.75)	(.81)	(.71)	(.72)	(.62)	(.65)	(.79)	(.84)	(.63)	(.73)

Standard deviations are in parentheses. *EA* European American, *AA* African American. G.P.A. is on a 1–13 scale and the other variables are on a 1–5 scale

the conditional model. In the conditional model, we entered gender and ethnicity terms as time-invariant (Level 2) predictors of the growth curves which allowed us to examine possible group differences in the growth trajectories of the adjustment variables. Initially, gender and ethnic terms were examined for all outcomes. If there were no differences by gender or ethnicity in the preliminary analysis, then those terms were dropped from the final models. For most outcomes, both gender and ethnicity

were important to understanding group differences on the intercept. To allow comparisons between different gender/ ethnic groups, we created four dummy-coded variables to capture students' gender and ethnicity (i.e., African American girls, European American girls, African American boys and European American boys). The omitted category was African American girls and thus the significance of the estimates for gender/ethnic membership reported in the tables indicated if the designated group was significantly different from African American girls. Other pairwise comparisons were conducted through contrast analysis to ascertain all group differences. Contrast results are reported in the text when significant. Results are summarized in Tables 4, 5, 6, 7 and displayed in Figs. 1, 2, 3, 4. The figures were created with the coefficients from the growth curve models.

The growth curve models estimate the best linear trajectory, which summarizes the general trend of change for the population. Thus, a growth curve can represent various patterns of changes (e.g., gradual increment over all time points or sudden increase or decrease in two particular time points with no variations across other time points). Therefore, if growth curve analysis indicated a significant increase or decrease over time, we followed up with paired t-tests to ascertain when the change was occurring: pre-transition (between times 1 and 2, when children were in an elementary school classroom), transition (between times 2 and 3, when children moved into a new middle school environment) or post-transition (between times 3 and 4, when children had experienced a year of the middle school environment). Results of paired t-tests are reported in text.

Table 2 (a) Correlations among variables at waves 1 and 2, (b) correlations among variables at waves 3 and 4

		1	2	3	4
(a)					
1.	G.P.A		.10**	.23**	.05
2.	Intrinsic value	.16**		.26**	.04
3.	Self-worth around teachers	.33**	.31**		.31**
4.	Self-worth around friends	.15**	.09*	.36**	
		1	2	3	4
(b)					
1.	G.P.A		.11*	.25**	.05
2.	Intrinsic value	.17**		.17**	.04
3.	Self-worth around teachers	.32**	.24**		.35**
4.	Self-worth around friends	.06	.03	.34**	

Coefficients below the diagonal are for wave 1 and above the diagonal are for wave 2

Coefficients below the diagonal are for wave 3 and above the diagonal are for wave 4

* $P < .05$, ** $P < .01$

Table 3 Preliminary analyses: Unconditional models

Parameter	Fixed effects		Variance parameters			
	Mean initial level	Mean growth rate	Initial status	Covariance	Linear growth rate	Level 1 error
	Est. (SE)	Est. (SE)	Est. (SE)	Est. (SE)	Est. (SE)	Est. (SE)
G.P.A.	8.01 (.11)***	−.59 (.04)***	6.56 (.45)***	−.40 (.11)***	.53 (.05)***	1.29 (.06)***
	(−13.55 to 29.57)	(−.67 to −.51)	(5.68 to 7.44)	(−.61 to −.18)	(.43 to .63)	(1.17 to 1.41)
Intrinsic value	2.96 (.03)***	−.12 (.01)***	.62 (.05)***	−.07 (.02)***	.04 (.01)***	.43 (.02)***
	(2.90 to 3.02)	(−.14 to −.10)	(.52 to .72)	(−.11 to −.03)	(.02 to .06)	(.39 to .47)
Self-worth @ teachers	3.81 (.03)***	.03 (.01)	.42 (.05)***	−.06 (.02)**	.04 (.01)***	.50 (.02)***
	(3.75 to 3.87)	(.01 to .05)	(.32 to .52)	(−.10 to −.02)	(.02 to .06)	(.46 to .54)
Self-worth @ friends	4.31 (.03)***	.01 (.01)	.26 (.03)***	−.03 (.01)**	.02 (.01)***	.30 (.01)***
	(4.25 to 4.37)	(−.01 to .03)	(.20 to .32)	(−.05 to −.01)	(.00 to .04)	(.28 to .32)

*** $Z(t) < .001$, ** $Z(t) < .01$, * $Z(t) < .05$. t-tests and Z-tests were used for the significance testing of fixed effect estimates and variance estimates respectively. 95 % confidence intervals are shown in the parentheses

Table 4 Developmental trajectories of G.P.A

Model parameter	Estimate	SE	df	t
Fixed effects				
Intercept (initial status)				
Mean initial status	7.54	0.17	619	44.81***
	(7.21 to 7.87)			
European American boys	1.39	0.26	619	5.37***
	(.88 to 1.90)			
African American boys	−1.15	0.25	619	−4.67***
	(−1.64 to −.66)			
European American girls	1.9	0.26	619	7.19***
	(1.39 to 2.41)			
Linear change				
Mean change rate	−0.59	0.04	1606	−15.38***
	(−.67 to −.51)			

	Estimate	SE	Z	
Variance components				
Intercept (initial status)	5.21	0.37	14.05***	
	(4.48 to 5.94)			
Covariance	−0.41	0.1	−3.89***	
	(−.61 to −.21)			
Slope	0.53	0.05	10.43***	
	(.43 to .63)			
Level 1 error	1.29	0.06	23.03***	
	(1.17 to 1.41)			

*** $Z(t) < .001$, ** $Z(t) < .01$, * $Z(t) < .05$. t-tests and Z-tests were used for the significance testing of fixed effect estimates and variance estimates respectively. 95 % CI are shown in the parentheses

Table 5 Developmental trajectories of intrinsic value

Model parameter	Estimate	SE	df	t
Fixed effects				
Intercept (initial status)				
Mean initial status	3.14	0.06	1033	50.56***
	(3.02 to 3.26)			
European American boys	−0.48	0.1	1033	−4.89***
	(−.68 to −.28)			
African American boys	−0.2	0.09	1033	2.13*
	(−.38 to −.02)			
European American girls	−0.07	0.09	1033	−0.83
	(−.25 to .11)			
Linear change				
Mean change rate	−0.11	0.01	1818	−7.97***
	(−.13 to −.09)			

	Estimate	SE	Z	
Variance components				
Intercept (initial status)	0.57	0.05	11.29***	
	(.47 to .67)			
Covariance	−0.06	0.02	−3.68***	
	(−.10 to −.02)			
Slope	0.04	0.01	4.41***	
	(.02 to .06)			
Level 1 error	0.43	0.02	24.46***	
	(.39 to .47)			

*** $Z(t) < .001$ ** $Z(t) < .01$, * $Z(t) < .05$. t-tests and Z-tests were used for the significance testing of fixed effect estimates and variance estimates respectively. 95 % CI are shown in the parentheses

Developmental Trajectories of Academic Adjustment and Relational Self-worth

Grade Point Average

As can be seen by the mean change rate, G.P.A. scores declined over time. There was no difference by gender or ethnicity in this pattern of change. Three paired t-tests examining change between each of the contiguous waves indicated there were significant mean differences in G.P.A. scores between waves 2 and 3 ($\Delta M = 1.20$, $t = 11.87$, $P < .001$) and waves 3 and 4 ($\Delta M = .53$, $t = 8.79$, $P < .001$) but not waves 1 and 2 ($\Delta M = .05$, $t = 1.00$, ns). Thus, the decline in G.P.A. began when students moved into middle school and persisted across the first year in middle school.

Associations for gender and ethnicity terms were related significantly to the intercept but not the slope indicating that the gender and ethnic differences present at time 1 were maintained across the four waves (see Table 4; Fig. 1). European American girls and boys had significantly higher G.P.A. scores than African American girls. African American boys had significantly lower G.P.A. scores than African

American girls. Not shown in Table 4, but determined through additional contrast analysis, was the finding that African American boys were significantly lower than all groups (F's 17.22–98.68, P's < .001). The difference between European American girls and boys was marginally significant.

Intrinsic Value for Schoolwork

As indicated by the mean change rate, intrinsic value for schoolwork declined over time. There was no difference by gender or ethnicity in this pattern of change. Three paired t-tests examining change between the contiguous waves indicated there were mean differences in value between waves 1 and 2 ($\Delta M = .24$, $t = 6.51$, $P < .001$), waves 2 and 3 ($\Delta M = .08$, $t = 1.79$, $P < .07$) and waves 3 and 4 ($\Delta M = .08$, $t = 2.22$, $P < .05$) although the difference between waves 2 and 3 was only marginal. Thus, the decline in value began when students were in elementary school and continued into the first year in middle school.

Table 6 Developmental trajectories of relational self-worth around teachers

Model parameter	Estimate	SE	df	t
Fixed effects				
Initial status				
Mean initial status	3.94	0.05	1033	83.13***
	(3.84 to 4.04)			
European American boys	−0.18	0.06	1033	−2.90**
	(−.30–.06)			
African American boys	−0.37	0.07	1033	−5.66***
	(−.51 to −.23)			
European American girls	0.01	0.06	1033	0.17
	(−.11 to .13)			
Linear change				
Mean change rate	0.02	0.01	1828	1.65
	(.00 to .04)			

	Estimate	SE	Z
Variance components			
Intercept (initial status)	0.4	0.04	9.07***
	(.32 to .48)		
Covariance	−0.06	0.02	−3.29**
	(−.10 to −.02)		
Slope	0.04	0.01	4.06***
	(.02 to .06)		
Level 1 error	0.5	0.02	24.97***
	(.46 to .54)		

*** $Z(t) < .001$, ** $Z(t) < .01$, *, $Z(t) < .05$. *t*-tests and *Z*-tests were used for the significance testing of fixed effect estimates and variance estimates respectively. 95 % CI are shown in the parentheses

Table 7 Developmental trajectories of relational self-worth around friends

Model parameter	Estimate	SE	df	t
Fixed effects				
Initial status				
Mean initial status	4.37	0.03	1035	146.73***
	(4.31 to 4.43)			
Gender	−0.13	0.04	1035	−3.48***
	(−.21 to −.05)			
Linear change				
Mean change rate	0.02	0.01	1824	1.6
	(.00 to .04)			
Ethnicity	−0.03	0.02	1824	−1.96*
	(−.07 to .01)			

	Estimate	SE	Z
Variance components			
Intercept (initial status)	0.26	0.03	9.24***
	(.20 to .32)		
Covariance	−0.03	0.01	−2.72**
	(−.05 to .04)		
Slope	0.02	0.01	3.52***
	(.00 to .04)		
Level 1 error	0.3	0.01	24.88***
	(.28 to .32)		

*** $Z(t) < .001$ ** $Z(t) < .01$, * $Z(t) < .05$. *t*-tests and *Z*-tests were used for the significance testing of fixed effect estimates and variance estimates respectively. 95 % CI are shown in the parentheses. Gender is coded 1 = boys and 0 = girls and ethnicity is coded 1 = European American and 0 = African American

Associations for gender and ethnic terms were related significantly to the intercept but not the slope indicating that the gender and ethnic differences present at time 1 were maintained across the four waves (see Table 5; Fig. 2). As seen by the significant effects for the gender/ethnic groups on the intercept in Table 5, African American girls were higher than both African American and European American boys. There was no significant difference between African American girls and European American girls. Not shown in Table 5, but determined through contrast analysis was the finding that European American boys had lower levels of intrinsic value than all other groups (*F*'s 7.51–23.87, *P*'s < .01). African American boys and European American girls were in the middle and not significantly different from each other.

Self-worth Around Teachers

As can be seen by the mean change rate, self-worth around teachers was stable over time. There was no difference by

gender or ethnicity in this pattern of change. Given the overall stability, we did not conduct follow-up *t*-tests. Associations for gender and ethnicity terms were related significantly to the intercept but not the slope, indicating that the gender and ethnic differences present at time 1 were maintained across the four waves (see Table 6; Fig. 3). As seen by the significant effects for the gender/racial groups on the intercept in Table 4, African American and European American girls reported similarly high levels of self-worth around teachers. European American and African American boys had significantly lower self-worth around teachers than African American girls. Not shown in Table 6, but determined through contrast analysis, African American boys were significantly lower than European American boys (*F* = 4.13 *P* < .05).

Self-worth Around Friends

The associations for gender on the intercept indicated that girls reported higher self-worth around friends than boys at time 1 (see Table 7; Fig. 4). The association for ethnicity
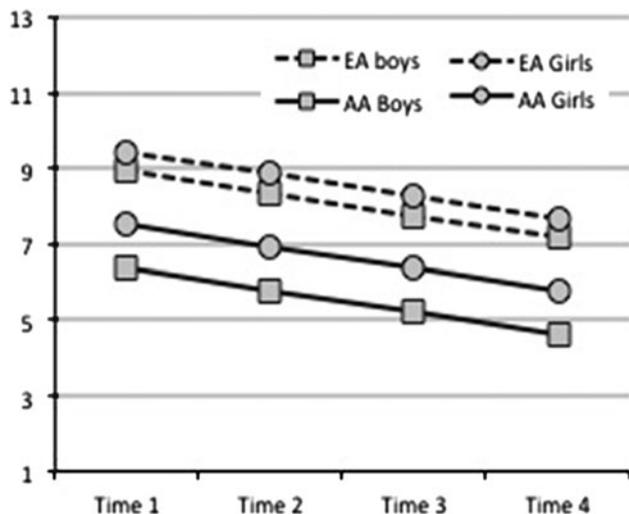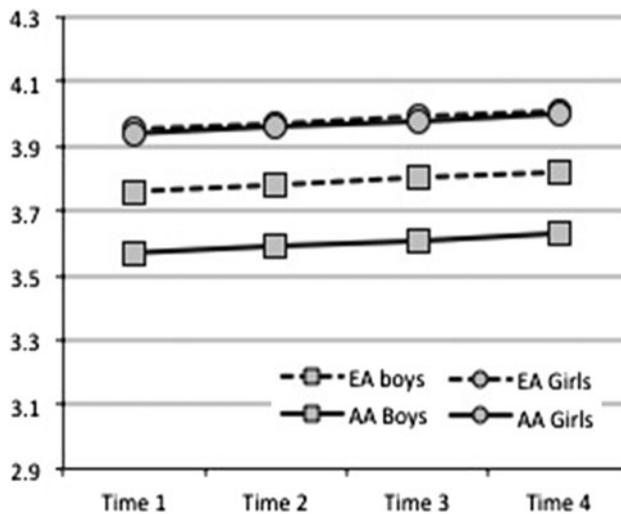
Fig. 1 Changes in G.P.A

Fig. 2 Changes in intrinsic value

Fig. 3 Changes in self-worth around teachers
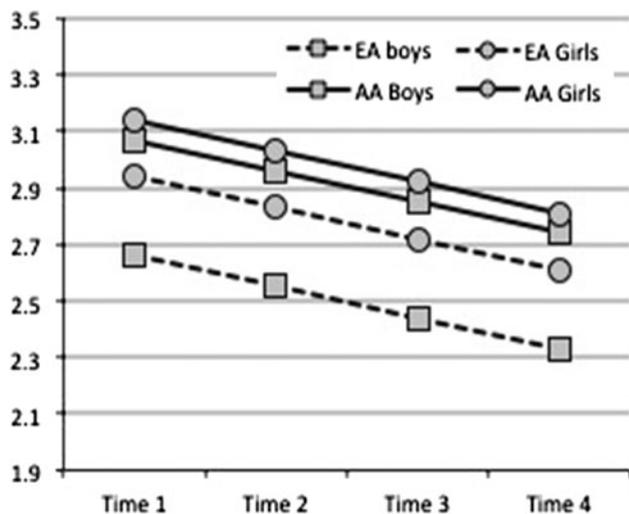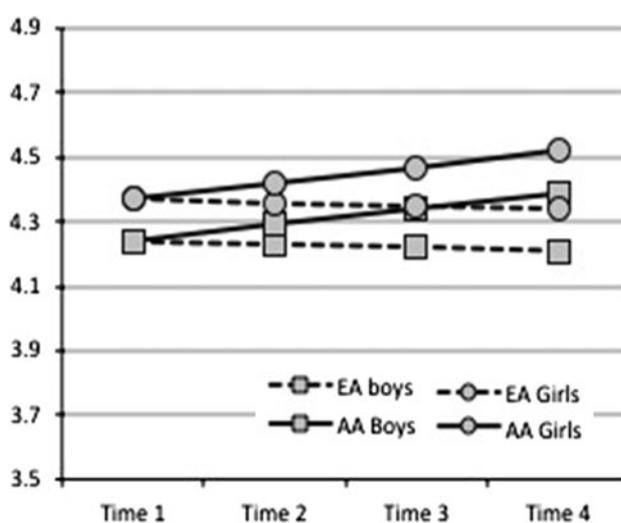

Fig. 4 Changes in self-worth around friends

on the slope indicated that African American students increased in self-worth around friends in contrast to European American students whose self-worth around friends was stable. Three paired t-tests examining change between each of the contiguous waves on African American students indicated that there was a significant mean difference in self-worth around friends between waves 2 and 3 ($\Delta M = .16$, $t = 3.53$, $P < .001$) but not waves 1 and 2 ($\Delta M = .01$, $t = .30$, ns) and waves 3 and 4 ($\Delta M = .07$, $t = 1.70$, $P = .09$). Thus, the increase in self-worth around friends for African American students was primarily due to the transition to middle school.

Given that there were group differences in the changes over time, we conducted contrast analyses between groups at time 4. By the spring of seventh grade, African American girls were significantly higher than all boys in self-worth around friends (F's 17.22–98.68, P's < .001) but not

significantly different from European American girls. There were no significant differences between European American girls and all boys.

Discussion

The nature of changes around the transition to middle school has been a long-standing concern and the focus of much research (Eccles 2004). The middle school years are widely characterized as challenging in all regards. Juvonen et al. (2004) note that middle schools are the "Bermuda Triangle" of education and are blamed for low achievement, behavior problems, and teen alienation. Our study, which brought to bear a more sophisticated research design and inclusive sample, indicates that development during the transition to middle school is more complex: academic

adjustment declined but relational self-worth was stable or improving.

Growth curve analyses indicated that the overall trend was a decline for academic adjustment for students. This pattern was the same regardless of gender or ethnicity. Follow-up analyses indicated that the decline in G.P.A. was due to the middle school transition. There were no changes from fall to spring in elementary school; declines started at the transition into middle school and continued across the first year in middle school. Are students decreasing in their academic performance, or are teachers using tougher grading practices in middle school? Eccles et al. (1993) found that middle school teachers are more likely to use normative grading procedures than elementary school teachers. However, our findings are consistent with large-scale analyses of standardized test scores that also find declines in students' achievement following the transition to middle school (Rockoff and Lockwood 2010). Declines in intrinsic value could be seen from fall to spring in elementary school. The downward trend continued as students moved into middle school and across the first year in middle school. Thus, decreases in motivation seem to be already happening prior to the transition. It is possible that intrinsic value declines from fall to spring in other grades as well, and typically recovers by the start of a new school year. Perhaps the transition effect here is that intrinsic value did not recover and increase in the fall of middle school.

Growth curve analyses indicated that self-worth around teachers was stable. It is interesting that, against this backdrop of declining academic achievement and intrinsic value, students reported feeling good about themselves around their teachers. This pattern was the same regardless of gender or ethnicity. Our findings for academic adjustment are consistent with prior work but our findings for relational self-worth around teachers are inconsistent with much prior work indicating that teacher support declines when students move into middle school. How can it be that students received lower grades and found their work less interesting but retained positive feelings about themselves around their teachers?

This may be explained by the fact that much of the research showing declines in teacher support after the transition to middle school was conducted in the 1980's (e.g., Feldlaufer et al. 1988). This was prior to wide-spread middle school reform efforts that began in the 1990's to make middle schools more developmentally responsive to early adolescents' needs. Many have commented that the reforms focused more on facilitating teacher-student relationships and making middle schools more welcoming and personal (Juvonen 2007) than increasing cognitive challenge and meaningful learning (Lipsitz et al. 1997a, b; Williamson and Johnston 1999). While recommended practices such as teaming and advisories were widely adopted and characterize most contemporary middle schools, shifts in learning philosophy or interdisciplinary teaching are less often observed perhaps because it is easier to improve the social climate than instructional practices (Juvonen et al. 2004; Midgley and Edelin 1998). Our pattern of declining academic adjustment in tandem with stable relational self-worth around teachers is consistent with this viewpoint.

How might middle school curriculum and instruction be improved to offer the kind of challenge and interest that students need during early adolescence? Interdisciplinary teaching and service learning have been touted as middle school practices that facilitate students' integrating their knowledge and connecting what they are learning with issues in their community (Lipsitz et al. 1997b; Williamson and Johnston 1999). However, these middle school practices did not characterize the setting for our sample and, in general, are less likely to be seen in middle schools (Juvonen et al. 2004; Lipsitz et al. 1997a). While the reform efforts of the 1990's made great strides, continued attention to developmentally appropriate curriculum and instruction for early adolescents in middle schools is needed to prevent the decline in intrinsic value for schoolwork that was found in our study.

Growth curve analyses indicated that self-worth around friends was stable for European American students and increased for African American students. The increase for African American students in relational self-worth around friends suggests a transition effect in that there was no change from fall to spring during elementary school but an increase when students moved into middle school. Several developmental issues might be relevant to understanding this pattern. First, students' friendships and peer groups become more segregated during early adolescence and across the transition to middle school (Graham et al. 2009). Second, there is increased attention to ethnic identity issues for minority youth during early adolescence (Rowley et al. 2011). Third, African American students become more distressed by discrimination experiences in their everyday social interactions during early adolescence (Fisher et al. 2000; Wong et al. 2003). Perhaps positive self-worth is promoted in the context of close friends for African American students as ethnic identity and discrimination issues become salient. The different pattern of change for relational self-worth around teachers and friends for African American students highlights the importance of distinguishing self-worth in different relational contexts (Harter et al. 1998). This distinction may be relevant to the achievement-esteem paradox that has found increasing general self-esteem in tandem with declining achievement (Rowley et al. 2011). Processes in the peer group context may play an important role in explaining this paradox.

The other group differences that were found in our study did not change across the transition but were already in place by the end of elementary school. This is an important finding indicating that the middle school transition is not contributing to group differences in G.P.A., intrinsic value and self-worth around teachers. The transition is neither cause nor remedy for the group differences that exist during this stage of life. The nature of the group differences shows the complexity of how gender and race intersect and affect adjustment. African American girls were in the middle in terms of G.P.A. but were high in intrinsic value and self-worth around teachers. European American girls were similarly high in value and self-worth around teachers as African American girls but also had high G.P.A. European American boys had the lowest intrinsic value and were moderate in G.P.A. and self-worth around teachers. African American boys were in the middle in terms of intrinsic value but had the lowest G.P.A. and self-worth around teachers. It is likely that developmentally responsive middle school practices would benefit all students but attention to how strengths and vulnerabilities vary by gender and ethnicity is important. For example, although the finding that self-worth around teachers was not susceptible to declines across the transition is encouraging, the fact that African American boys' self-worth around teachers is lower than all other students and remains so across the middle school year is concerning. Specific attention by educators as to why this pattern exists and how to alter it is needed.

Strengths and Limitations

The present study attempted to revisit and refine the examination of adjustment during the transition to middle school. With multiple time points before and after the transition, we were able to estimate overall trajectories and distinguish within- and between-year changes and garner a more complete understanding of development around the transition to middle school. However, we only followed students through the end of their first year in middle school. Tracking students' development for a longer time frame could be informative about development throughout the middle school years. With a sample that was approximately half African American and half European American, we were able to expand the empirical research base on changes across the transition for African American students, which is more limited than that of European American students. However, with two ethnic groups, we cannot generalize to other ethnic minority groups who also have been less studied in middle school transition research. Future work on more diverse samples is needed.

Another important issue that future work could address is examining changes in achievement with measures other than grades. Although classroom grades have real-life ecological validity and are outcomes that matter to children, parents and teachers, they are limited in that they lack a common metric over time. The declines in grades could reflect changes in criteria for grades from elementary to middle school (Eccles et al. 1993). Many of the existing studies examining the middle school transition have considered grades as an outcome variable. Additional work on standardized test scores in tandem with grades could add to our understanding of the implications of the middle school transition on changes in achievement.

Conclusion

The middle school transition often is characterized as challenging in all regards. Some of the best-designed and most cited research on changes in students' academic and social adjustment during the transition to middle school was conducted several decades ago. Appraisals of middle schools as problematic environments for most aspects of students' development may be based on the preponderance of studies conducted in the past that are not particularly relevant to today's schools and youth. Our findings paint a more nuanced picture: students' academic adjustment declined but relational self-worth around teachers and friends was stable or improving. Our pattern of results may reflect changes in the climate of middle schools that have taken hold due to reforms over the past two to three decades. While it is encouraging that students' relational self-worth was found to be stable or improving, the declines in academic adjustment indicate that development during the transition to middle school is a topic that merits continued attention.

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