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### **CHAPTER 3: PRELIMINARY ANALYSES AND ANALYTIC PLAN**

In this chapter, we describe our preliminary analyses and analytic plan. The preliminary analyses were focused on several aspects of construct validity. We first distinguish between *construct invariance* and *measurement invariance* as two different approaches to establishing that our scales mean the same thing to adolescents categorized as African American or European American and female or male. We then consider the extent to which (a) correlations between the same construct assessed at different points in time provide evidence of *convergent validity* and (b) correlations between a given construct and theoretically similar and dissimilar construct provide evidence of convergent and *discriminant validity*, respectively. Given that our assessment of construct invariance (described below) revealed some differences in the magnitude and direction of correlations for the R/E discrimination measures across the four R/E and gender groups, we next describe our analysis of measurement invariance for these measures. Finally, we provide an overview of the HLM analyses that were used to examine the growth curve trajectories in Chapters 4 through 9 and describe how the results are presented in the tables and figures.

#### **Preliminary Analyses**

In this section, we explore the extent to which our measures relate similarly to each other both within and across time for our four groups. In order to accomplish this goal, we appealed to Nesselroade et al.'s (2007) distinction between specific item content and the abstract meaning of the corresponding measures. Nesselroade and

colleagues (e.g., Nesselroade et al., 2007; Nesselroade, Gerstorf, Hardy, & Ram, 2009; Nesselroade & Molenaar, 2010; Zhang, Browne, Nesselroade, 2011) have argued that using factor-loading patterns (or other aspects of measurement models, such as item means) as the basis for invariance claims may be putting the invariance emphasis at the wrong level of abstraction; that is, “a rigidly standardized measurement framework at the observable level may not be the most appropriate and compelling way to proceed with the assessment of abstract constructs” (Zhang et al., 2011, p. 198). The primary reason for this concern seems to be that, as scientists who study developmental processes, they are familiar with the challenge of studying abstract, dynamic processes (e.g., autonomy) that challenge simple measurement procedures. For example, expressions of autonomy are expected to vary across developmental time such that the same behavior (e.g., getting dressed alone, getting to school alone) may be less useful for understanding autonomy at different ages, even though the abstract concept of autonomy remains the same. As a strategy for maintaining focus on the abstract psychological concept under study, they suggested allowing some item responses to vary across individuals and focusing more on the relations among the abstract concepts (e.g., correlations among factors). Although we did not conduct the statistical tests for assessing construct invariance described by Nesselroade and colleagues, we used their conceptual distinction between specific item content and the abstract meaning of the corresponding measures to guide our examination of the extent to which the patterns of correlations among our domain-specific measures support our assumption that the meaning of the measures used in this study are sufficiently similar to allow meaningful interpretation of growth, and differences in growth, across groups.

**Correlational Analyses.** For the correlational analyses, we focused on addressing two major questions: (a) Do the patterns of correlations of the same

construct with itself across waves, and the patterns of correlations of different constructs within and across domains, provide evidence of convergent and discriminant validity as well as support our decisions about which scales to aggregate to a more general level and which to keep separate? and (b) Are the patterns of these correlations within and across domains similar enough across the R/E by gender groups to justify our assumption that the scales have comparable meanings across the four groups?

To address these questions, we conducted two sets of correlational analyses. First, we examined correlations within each domain across waves for each R/E and gender group, separately. These tables are presented online as supplementary material (see Supplementary Materials, Tables S1 to S12). Second, we examined the associations across domains within each wave for each R/E and gender group. Tables 3 and 4 present the Wave 3 correlational matrices for African American males and females and European American males and females, respectively. The correlations within Waves 1, 4, and 5 for each R/E and gender group are presented online as supplementary material (see Supplementary Materials, Table S13 to S18).

Regarding the first question, most of the correlations between different waves of the same measure were significant (Cohen, 1988). According to Cohen, correlation coefficients in the order of .10 are “small,” those of .30 are “medium,” and those of .50 are “large” in terms of magnitude of effect sizes (see pp. 77–81). Given that the majority of relevant correlations were medium in magnitude, these patterns support our assumption that the scales, by and large, showed convergent validity across time. Within Wave 3, constructs within domains were generally correlated more highly than constructs across domains, supporting both convergent and discriminate validity. Across domains, measures of positive adolescent characteristics and contexts were generally positively associated with each other, and the same was true for relations

among negative characteristics, demonstrating the convergent validity of these measures. However, the strength of the correlations between similarly negative or positive measures within the same domain and measures in other domains often differed, supporting our decision to examine trajectories of distinct constructs within domains as opposed to higher-order constructs that could be constructed for other purposes. Regarding the second question, the associations between different measures within and across domains were quite similar across the four subgroups for most, but not all, of the measures. We next describe these patterns in more detail.

For **psychological well-being**, the correlations across waves of the same construct were generally medium to large in magnitude, showing convergent validity across time (see Supplementary Materials, Tables S1 and S2). Within Wave 3, measures of psychological well-being generally had medium to large associations with each other in the expected direction with the exception of Negative Chances, demonstrating convergent validity (see Tables 3 and 4). On the other hand, measures of psychological well-being had associations with R/E discrimination measures that were small in magnitude, showing discriminant validity. Furthermore, the strength of the associations between Wave 3 measures of psychological well-being and those from other domains differed depending on the measure in question. For example, there were stronger associations between Resiliency and GPA than between Self-Esteem and GPA, further supporting our decision to examine separately each of these positive indicators of psychological well-being as opposed to combining them into a higher-order factor (see Tables 3 and 4). Within the Wave 3 measures, there were also significant correlations within and across domains that were generally similar in magnitude among all four groups (see Tables 3 and 4). For example, the correlations between Negative School Chances and School Problems were .31 for African American males, .35 African

American females, .39 for European American males, and .34 for European American females. Thus, these associations generally support our assumption that the psychological well-being scales have comparable meanings for these four subgroups.

For **R/E identity and discrimination**, the same measures were significantly associated across waves, for the most part, showing convergent validity across time (see Supplementary Materials, Tables S3 and S4). Within Wave 3, the correlations between the two R/E identity measures, between the two friendship measures, and among the three discrimination measures were generally medium to large in magnitude (see Tables 3 and 4), demonstrating convergent validity. However, the correlations among the R/E identity, friendship, and discrimination measures were low, demonstrating discriminant validity. Among the four groups, we could not assess similarities for the R/E identity measures, as these were only assessed for African American adolescents, but they were generally similar in magnitude for African American males and females. The R/E friendship measures were generally associated weakly with measures in other domains for both African American and European American adolescents. For R/E discrimination, there were generally weak associations with measures in other domains, but there were moderate associations with many of the measures in the psychological well-being and academic functioning domains for European American adolescents. These findings suggest that the R/E discrimination measures have different meanings across race/ethnicity.

For our measures of **academic functioning**, there were significant associations within the same construct across waves that were medium to large in magnitude, showing convergent validity across time (see Supplementary Materials, Tables S5 and S6). Within Wave 3, the magnitude of the correlations among measures of academic functioning were generally medium in magnitude, demonstrating convergent validity

(see Tables 3 and 4). Across domains, the magnitude of many of the correlations between psychological well-being, problem behaviors, and academic functioning were generally medium, also supporting the assumption of convergent validity; whereas the magnitude of the correlations between measures of academic functioning and family characteristics were generally small, showing discriminant validity. There is also good evidence that these constructs have different meanings and should be kept as first-order rather than second-order variables. For example, Educational Expectations had stronger correlations with Self-Esteem and Resiliency compared to the correlations between Educational Aspirations and these two constructs. Among the four groups, the correlations were generally similar in both magnitude and direction, showing that these constructs have similar meanings across gender and race/ethnicity (see Tables 3 and 4). For example, the correlations between Resiliency and Academic Self-Concept were .47 for European American females, .30 for European American males, .36 for African American males, and .38 for African American females.

For **problem behaviors**, there were positive correlations for measures across waves that were generally small to medium in magnitude, showing convergent validity across time (see Supplementary Materials, Tables S7 and S8). Within Wave 3, the correlations among the problem behavior measures were often large in magnitude, particularly among similar types of behaviors such as School Problems and Delinquent Behaviors, demonstrating convergent validity (Tables 3 and 4). Across domains, the correlations between problem behaviors and many indicators of mental health as well as positive and negative peers were generally medium in magnitude, providing further evidence of convergent validity. However, the magnitude of the correlations between problem behavior measures and R/E discrimination measures were small in magnitude, showing discriminant validity. There was also good evidence that these measures had

distinct associations with other measures, highlighting the importance of keeping them as first- rather than second-order variables. For example, alcohol use generally had stronger correlations with mental health problems than did marijuana use.

Among the four groups, correlations were similarly small to medium in magnitude and were in the same direction thus supporting the assumption that these constructs have similar meanings across both gender and race/ethnicity. For example, engaging in problem behaviors and having negative peers had associations that were medium in magnitude for all four groups, with the correlations being .28 for African American females, .36 for African American males, .35 for European American females, and .44 for European American males. This was not the case, however, for substance use behaviors. The correlations between cigarette, marijuana, and alcohol use and measures in other domains often differed among the four groups. For example, cigarette use had stronger correlations with psychological well-being for European American females compared to the other three groups, whereas marijuana use had lower associations with measures in other domains for females compared to males. However, given that these measures were based on a single items used in population studies such as Monitoring the Future (cf. O'Malley et al., 1987) regarding behaviors in the past 30 days, these findings likely reflect low frequencies for these groups rather than construct invariance.

For **family characteristics**, correlations of the same construct across waves were generally medium to large in magnitude, demonstrating convergent validity across time (see Supplementary Materials, Tables S9 and S10). Within Wave 3, family characteristics had medium to large associations with each other in the expected direction, showing convergent validity (see Tables 3 and 4). Across domains, the correlations were small to medium in magnitude, showing both convergent and

discriminant validity. For example, the correlations between Parent-Adolescent Communication and Peer Communication were medium in magnitude, but the correlations between Intrusive Parenting and Peer Communication were small in magnitude. Furthermore, the strength of these associations often differed, supporting our decision to keep these measures separate. For example, although Negative Interactions with Parents generally had negative, significant associations with Positive Identification with Parents, it generally was not significantly associated with Parent-Adolescent Communication. Among the four groups, there was good evidence that associations were similarly small to medium in magnitude and in the expected direction (see Tables 3 and 4). For example, the associations between Strict Parenting and Negative Interactions with Parents were .20 for African American males, .22 for African American females, .24 for European American females, and .23 for European American males. Furthermore, the correlations between measures of parental control and psychological functioning were generally small to medium in magnitude for all four groups, supporting our assumption that the measures of family characteristics have similar meanings across both race/ethnicity and gender.

For **peer characteristics**, correlations for the same construct across waves were generally small to medium in magnitude, demonstrating convergent validity across time (see Supplementary Materials, Tables S11 and S12). Within Wave 3, having positive peers was positively correlated with psychological well-being, good relationships with parents, and academic functioning, whereas negative peers was positively correlated with poor mental health and engagement in problem behaviors. For example, the correlations between Negative Peers and Negative Chances were large in magnitude, showing convergent validity. On the other hand, the correlations between Peer Communication and Eating Disorders were small in magnitude, demonstrating

discriminant validity. Within Wave 3, patterns for the associations both within and across domains also varied, supporting our decision to keep these measures separate (see Tables 3 and 4). For example, the associations between Negative Peers and Delinquent Behaviors were stronger in the positive direction than the associations between Positive Peers and Delinquent Behaviors in the negative direction, confirming that these two measures are not simply opposite ends of the same dimension. Among the four groups, there is good evidence that the correlations among the peer measures and the correlations between the peer measures and measures in other domains are similar in magnitude and direction, supporting the assumption that these constructs have similar meanings across gender and race/ethnicity. For example, the correlations between Positive Peers and Peer Support were .23 for African American females, .19 for African American males, .26 for European American males, and .19 for European American females. Furthermore, the correlations between Positive Peers and Delinquent Behaviors were -.23 for African American females, -.18 for African American males, -.20 for European American males, and -.26 for European American females.

**Summary.** The correlational analyses showed evidence of both convergent and discriminant validity of our measures across both time and domains. They also provided support for our decision to treat the various measures within each domain as separate constructs rather than aggregating them up to a more general level. The patterns of correlations further provided support for our assumption that most of the scales operate similarly both within and across time for the four groups, with the exception of the R/E discrimination measures. Given that the patterns of correlations showed that the R/E discrimination measures varied across race/ethnicity, we next explored the source of these differences by testing whether their measurement

properties (e.g., factor-loading patterns) were invariant across race/ethnicity and gender, focusing on Wave 3 measures.

**Invariance Tests of R/E Discrimination Measures.** We tested successive degrees of measurement invariance using *Mplus* 5.21 (Muthén & Muthén, 1998-2010) for our R/E discrimination measures. To do this, we constructed a series of models examining race/ethnicity and gender separately to determine whether and where the differences might lie. In the first (i.e., configural) model (Meredith, 1993), which assesses whether items load only on the intended factor, we estimated factor loadings between each construct and its theoretically-specified indicators (with one factor loading per construct set to 1 for identification purposes). In the second (i.e., weak) model, the factor loadings were constrained to be equal across race/ethnicity or gender. In the final (i.e., strong) model, the item intercepts were also constrained to be equal across race/ethnicity or gender. Weak and strong invariance were tested for each construct separately by constraining appropriate parameters of each construct, in turn.

We examined the change in both the chi-square and the comparative fit index (CFI) between successive models. The chi-square statistic and the change in chi-square test are influenced by sample size. When sample size is large, as in this study, the change in chi-square test can be statistically significant even when the change in the model is relatively small. Therefore, we used  $\Delta\text{CFI} \geq .01$  to determine the form of measurement invariance for each construct (Cheung and Rensvold, 2002).

Table 5 presents the findings of the race/ethnicity invariance tests. Overall, the R/E discrimination measures showed weak invariance across both race/ethnicity and gender, where  $\Delta\text{CFI} \geq .01$ . The R/E discrimination measures showed strong invariance for gender, where  $\Delta\text{CFI} \geq .01$ , but not for race/ethnicity. Table 6 presents the Wave 3 item-level means of the R/E discrimination measures for the R/E and gender groups.

Here we can see that there were greater differences in some of the items between the R/E groups, which explains why tests of strong invariance failed. This is most evident in Expected R/E Discrimination, where there was a greater differential regarding discrimination on a job versus in education for African American versus European American adolescents. This is also shown in Parents' Worries about Education, where African American parents were more worried about discrimination at work and European American parents were more worried about discrimination at school. As expected, there were no significant differences according to gender for these measures.

**Summary.** Using correlational analyses and measurement invariance tests, we examined the construct and measurement invariance of our constructs. Our findings showed that R/E discrimination measures did not show construct invariance or strong measurement invariance across race/ethnicity. Therefore, although we included gender, race/ethnicity, and the gender by race/ethnicity interaction in our models, we did not directly compare R/E differences in mean levels of the intercepts and slopes for the R/E discrimination measures, where describing the findings. The significance of these differences across the respective groups, which are presented in the tables, should thus be interpreted with caution.

Overall, however, the correlational analyses indicated that the majority of the constructs were related similarly to each other across groups. Therefore, we believe that most of the measures used in this study can be assessed meaningfully using items that may mean something slightly different for different people or for the same person at different points in time. For the purposes of the descriptive analyses reported here, and consistent with the idea that abstract concepts can have the same meaning across groups and time, despite the possibility of differences in the meaning of specific item content (Nesselroade et al., 2007), we assume that the meaning of the scores on the

majority of scales in this study are sufficiently similar across groups and time to warrant meaningful comparisons of growth parameters across our four race/ethnicity and gender groups.

## **Analytic Plan**

**Overview of Data Analyses.** In order to describe the developmental trajectories, we used a two-level hierarchical linear model (Raudenbush, Bryk, Cheon, & Congdon, 2000). As there are multiple observations, waves of data are nested within adolescents. Two types of models define a two-level HLM. The Level-1 model provides the average trajectory across time, and the Level-2 model accounts for the variation across individuals. For the Level-1 model, we used adolescents' age rather than wave to account for time. Using age, rather than wave, provides a more sensitive time metric where analyzing MADICS data because the date of survey responses for any given individual, and thus their age at each wave, varied substantially both within and between individuals (e.g., a given person could be the first to respond at one wave and the last to respond in another wave). Using age as the time metric also allowed us to graph our results by reference to changes from early to late adolescence, ranging from 12 to 20 years. The Level-2 model included SES, adolescent's gender and race/ethnicity, the interaction between gender and race/ethnicity, and parents' marital status.

*Level-1 Model.* We assume that  $Y_{ti}$ , the observed status at time  $t$  for individual  $i$ , is a function of a systematic growth curve trajectory or growth curve plus random error (Bryk & Raudenbush, 1992):

$$Y_{ti} = \beta_{0i} + \beta_{1i}(\text{Age}_{ti} - 14.23) + \beta_{2i}(\text{Age}_{ti} - 14.23)^2 + e_{ti}$$

In this equation, the mean age of target adolescents at Wave 3 (i.e., 14.23 years) was subtracted from the individual's age so that  $\beta_{0i}$  represents the score on the outcome at age 14.23,  $\beta_{1i}$  represents the rate of change in the outcome at age 14.23, and  $\beta_{2i}$

estimates changes in the rate of change in the outcome over time, characterizing growth patterns that are not linear. By “centering” the equation in this manner, parameters that would be otherwise meaningless can be interpreted in relation to the age in the middle of the developmental period being studied (Bryk & Raudenbush, 1992, pp. 25-29). The coefficient,  $e_{ti}$ , represents the proportion of  $Y_{ti}$  that is not modeled; that is, the conditional error or residual variance.

*Level-2 Model.*  $\eta_{0i}$ ,  $\eta_{1i}$ , and  $\eta_{2i}$  are the outcome measures for the Level-2 equations:

$$\eta_{0i} = \eta_{00} + \eta_{01}(\text{SES})_i + \eta_{02}(\text{Gender})_i + \eta_{03}(\text{Race/Ethnicity})_i + \eta_{04}(\text{Gender}^* \text{Race/Ethnicity})_i + \eta_{05}(\text{Single})_i + \eta_{06}(\text{Married})_i + \eta_{07}(\text{MeanAge})_i + \eta_{08}(\text{MeanAge})_i^2 + r_{0i}$$

$$\eta_{1i} = \eta_{10} + \eta_{11}(\text{SES})_i + \eta_{12}(\text{Gender})_i + \eta_{13}(\text{Race/Ethnicity})_i + \eta_{14}(\text{Gender}^*$$

$$\text{Race/Ethnicity})_i +$$

$$\eta_{15}(\text{Single})_i + \eta_{16}(\text{Married})_i + r_{1i}$$

$$\eta_{2i} = \eta_{20} + \eta_{21}(\text{SES})_i + \eta_{22}(\text{Gender})_i + \eta_{23}(\text{Race/Ethnicity})_i + \eta_{24}(\text{Gender}^*$$

$$\text{Race/Ethnicity})_i +$$

$$\eta_{25}(\text{Single})_i + \eta_{26}(\text{Married})_i + r_{2i}$$

The set of constant terms for the level-2 equations defines the growth curve when all of the covariates in the model are set to zero. Given the coding of the level-2 covariates (described below),  $\eta_{00}$  is the sample mean at age 14.23,  $\eta_{10}$  is the average rate of change in the outcome variable at age 14.23, and  $\eta_{20}$  is the degree of curvature averaged across the sample (Bryk & Raudenbush, 1992, pp. 25-29). The coefficients,  $r_{0i}$ ,  $r_{1i}$ , and  $r_{2i}$  represent the residual variances of the intercept, linear slope, and quadratic slope, respectively. The residual variance for the quadratic slope,  $r_{2i}$ , was not estimated in models with only three waves of data due to insufficient degrees of freedom (Morgan, Farkas, & Wu, 2009).

SES was standardized (i.e., mean centered and divided by its sample standard deviation) so that the coefficients,  $\beta_{01}$ ,  $\beta_{11}$ , and  $\beta_{21}$  reflect differences in the outcome per one standard deviation change in the predictor variable. The coefficients for gender,  $\beta_{01}$ ,  $\beta_{12}$ , and  $\beta_{22}$ , represent the difference in the growth curves for male and female adolescents, where all other covariates are held constant. The coefficients for race/ethnicity,  $\beta_{03}$ ,  $\beta_{13}$ , and  $\beta_{23}$  represent the difference in the growth curves for African American and European American adolescents where all other covariates are held constant. Gender and race/ethnicity were coded with -.5 assigned to males and African Americans and +.5 assigned to females and European Americans. Using contrast codes rather than dummy codes allows one to interpret more easily the equations with interaction terms (Cohen, Cohen, West, & Aiken, 2003). Positive values indicate higher means, slopes, and more convex curvature for European Americans and females, whereas negative values indicate higher means, slopes, and more concave curvature for African Americans and males.

The coefficients,  $\beta_{04}$ ,  $\beta_{14}$ , and  $\beta_{24}$  represent the interactions between gender and race/ethnicity. Because we found very little evidence of SES by race/ethnicity or gender interactions in our preliminary analyses, we limited our assessments of interactions to those involving gender by race/ethnicity. Thus, two- and three-way interactions amongst other demographics variables were not included in the final models due to their overall lack of significance. The coefficients,  $\beta_{05}$ ,  $\beta_{15}$ , and  $\beta_{25}$  represent the growth curves for adolescents of single, never married parents. The coefficients,  $\beta_{06}$ ,  $\beta_{16}$ , and  $\beta_{26}$  represent the growth curves for adolescents of married, intact parents.

Individuals' means for age and age-squared were included at the intercept,  $\beta_{0i}$ . These terms ensure that the equations for linear and quadratic change reflect only within-individual change and not stable individual differences that are confounded due

to the timing of data collection or attrition that may be associated with differences between individuals in each wave. Otherwise, growth curve estimates could be influenced not only by within-individual change over time but, also, by any stable individual differences between those who stayed in the study and those who dropped out (Bryk & Raudenbush, 1992, pp. 121-123).

**Reporting Findings and Presentation of Tables and Figures.** In the next several chapters, we present the results of the HLM analyses according to domain (i.e., psychological well-being, R/E identity and discrimination, academic functioning, problem behaviors, family characteristics, and peer characteristics). For each domain, three sets of HLM analyses were performed. First, we examined the unconditional means model, which is a model with no predictors at either level. The unconditional means model partitions the total outcome variation into between- and within-person variation. Using the unconditional means model, we calculated the intra-class correlation (ICC), which estimates the total proportion of variation that lies between individuals, regardless of time. Second, we examined an unconditional growth model, which is a model with age as the only level-1 predictor and no level-2 predictors added. The unconditional growth model estimates the baseline amount of change. Using the first two models, we calculated the proportional reduction in the level-1 variance components explained by time ( $R^2$ ). Third, we examined the conditional growth curve model, with the level-2 predictors added. We then calculated how much of the within-person variation was explained by the level-2 predictors.

For each construct, key results are reported in two tables. The first table provides the coefficients in the full conditional growth curve model, with the level-2 predictors. The second table provides the residual variance in the unconditional means model, unconditional growth model, and conditional growth model (i.e., listed in the tables as

“With Level-2 Predictors”), as well as the ICC,  $R^2$  of the within-person variation associated with time, and the percent of variance that was explained in the intercept and slope parameters by adding the level-2 predictors. Figures for each measure are presented showing mean-level trajectories adjusted for model covariates according to race/ethnicity and gender, regardless of their significance, for the purpose of comparison across and within domains. For SES and parents’ marital status, figures are presented only where either variable moderates quadratic trends, where  $p < .01$ . Given that the growth curve trajectories were calculated using adolescents’ age rather than wave, the x-axis was labelled with adolescents’ age from 12 to 20 years. For clarity and consistency across measures, the figures were constructed using the full range of responses for each measure on the y-axis, with the exception of Educational Aspirations, Educational Expectations, and Occupational Aspirations. Note that the full range of responses vary across figures so that it is not warranted to directly compare the figures without taking into account the range being shown.

In each section, we begin with a brief overview of the measures and then discuss the findings for each construct. In light of the large sample and number of statistical analyses performed, we limit our discussion to cases where  $p < .01$ , although tables report significance levels where  $p < .05$ . Findings related to gender and race/ethnicity are highlighted, although significant results relating to SES and parents’ marital status are also mentioned briefly. Lastly, we provide a summary of our findings within each domain. This overview focuses on the significant findings within each domain for the average adolescent as well as significant trends in the differences according to adolescents’ gender, race/ethnicity, and their interaction, as well

Table 3

Correlations among Wave 3 Measures for African American Adolescents

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1. Self-Esteem	1.00	.38	-.38	-.50	-.40	-.17	.05	.16	-.04	-.03	-.05	-.12	.03	.19	.03	.18	.11	.30	.27	.28	-.18	-.09	-.21	-.03	.11	-.01
2. Resiliency	.28	1.00	-.24	-.25	-.14	-.10	.09	.22	.01	.08	.03	.01	.05	.24	.16	.20	.11	.35	.38	.25	-.12	-.10	-.17	-.06	-.00	-.01
3. Anger	-.32	-.15	1.00	.50	.22	.20	-.11	-.06	.11	-.10	.12	.14	.09	-.23	-.06	-.15	-.06	-.23	-.19	-.25	.34	.10	.33	.24	.00	-.01
4. Depressive Affect	-.39	-.24	.25	1.00	.37	.25	.00	.00	.03	.02	.16	.15	.06	-.17	-.04	-.15	-.09	-.26	-.31	-.27	.31	.12	.30	.30	-.01	-.01
5. Eating Disorders	-.25	-.22	.26	.38	1.00	.06	.05	-.01	.00	.05	.10	.16	.06	-.11	.01	.08	.07	-.06	-.08	-.23	.19	.09	.03	.02	.06	-.01
6. Negative Chances	-.11	-.11	.27	.15	.04	1.00	.00	-.02	.02	-.11	.15	.05	.05	-.18	-.04	-.20	-.07	-.14	-.19	-.19	.35	.06	.31	.23	-.07	-.01
7. R/E Importance	.05	.16	.03	-.16	-.02	-.09	1.00	.38	.00	.01	.15	.17	.12	-.01	-.02	.04	-.01	.04	.08	.06	.05	-.03	-.02	-.10	.03	-.01
8. R/E Behavioral Involvement	.10	.10	.09	-.04	.01	-.08	.29	1.00	.02	.10	.16	.18	.18	.13	.12	.18	.02	.17	.24	.12	-.01	-.02	.03	-.09	.04	-.01
9. Same R/E Friends	.00	-.01	.04	-.16	-.10	.11	.07	-.01	1.00	-.58	-.04	.10	-.05	-.06	-.05	-.01	-.06	-.08	.04	-.11	.11	-.08	.11	-.02	-.14	-.01
10. Cross R/E Friends	.00	.04	-.07	.17	.05	-.13	-.06	.03	-.58	1.00	.01	-.03	.02	.10	.10	.10	.02	.14	.08	.18	-.14	.07	-.19	-.05	.08	-.01
11. Expected R/E Discrimination	-.06	-.06	.09	-.03	-.02	.11	.19	.09	.05	-.10	1.00	.40	.45	.08	.14	.09	.13	.00	.02	-.12	-.06	.00	.00	.07	.07	-.01
12. John Henryism	-.01	.06	.10	-.03	.00	.14	.20	.20	.06	-.13	.32	1.00	.29	.09	.13	.16	.09	-.06	-.03	-.12	.05	.01	.08	-.03	-.05	-.01
13. Parent Worries about Discrimination	-.08	.05	.07	-.04	-.08	.12	.16	.18	.09	-.04	.41	.33	1.00	.09	.07	.11	.12	.12	.10	-.06	.01	-.03	-.01	-.03	.02	-.01
14. GPA	.10	.24	-.21	-.08	-.09	-.16	.05	.12	-.04	.04	.09	.11	.12	1.00	.27	.30	.17	.18	.35	.15	-.33	-.13	-.30	-.14	-.05	-.01
15. Educational Aspirations	.09	.18	-.10	-.10	-.06	-.15	.18	.10	.05	-.06	.18	.07	.12	.11	1.00	.63	.46	.15	.18	.11	-.12	-.16	.00	-.07	-.10	-.01
16. Educational Expectations	.10	.27	-.13	-.17	-.03	-.10	.15	.13	.08	-.10	.10	.13	.12	.24	.62	1.00	.37	.15	.24	.14	-.14	-.13	-.08	-.19	-.03	-.01
17. Occupational Aspirations	.02	.07	-.07	.02	-.04	-.03	.03	.06	-.03	.04	.07	-.01	-.02	.10	.19	.18	1.00	.22	.22	.05	-.02	-.15	.01	-.02	-.05	-.01
18. Academic Importance	.06	.20	-.15	-.24	-.28	-.15	.08	.05	.02	-.01	.01	.08	.11	.27	.20	.17	.16	1.00	.64	.35	-.12	-.05	-.07	-.04	.10	-.01
19. Academic Self-Concept	.14	.36	-.12	-.24	-.29	-.09	.06	.08	.02	.01	.03	.07	.11	.31	.24	.21	.07	.58	1.00	.27	-.15	-.13	-.13	-.10	.01	-.01
20. Positive School Identification	.18	.21	-.17	-.07	-.10	-.12	.06	-.08	-.01	.11	-.02	-.15	-.07	.08	.04	.09	.04	.18	.15	1.00	-.19	-.10	-.10	-.15	.01	-.01
21. School Problems	-.16	-.10	.22	.12	.14	.31	.00	.06	.09	-.12	.11	.11	.02	-.10	-.09	-.05	-.03	-.22	-.13	-.18	1.00	.21	.56	.30	.21	-.01
22. Cigarette Use	-.12	.03	.11	.13	.21	-.02	.07	.02	-.02	.01	.10	.11	.03	-.01	.02	-.03	-.01	.00	.05	-.04	.23	1.00	.29	.37	.66	-.01
23. Delinquent Behaviors	-.29	-.18	.31	.30	.19	.31	-.04	.04	.06	-.05	.16	.05	.00	-.12	-.15	-.14	.00	-.28	-.18	-.09	.64	.28	1.00	.43	.30	-.01
24. Alcohol Use	-.21	-.14	.29	.31	.12	.29	.02	.10	.03	-.05	.10	.13	.04	.05	-.03	-.15	.01	-.08	-.06	-.21	.37	.44	.42	1.00	.47	-.01
25. Marijuana Use	-.29	-.11	.21	.22	.30	.14	.06	.08	.01	-.08	.04	-.04	-.07	-.02	.01	-.14	-.16	-.07	-.02	-.12	.30	.55	.34	.60	1.00	-.01
26. Intrusive Parenting	-.24	.12	.17	.08	.05	.23	-.02	.18	-.01	-.06	.05	.12	.20	-.17	-.10	-.07	-.05	-.12	-.10	-.15	.13	.05	.19	.05	.09	1.00
27. Negative Interactions with Parent	-.20	-.29	.18	.16	.08	.18	-.03	.04	-.03	.05	.02	.06	.04	-.08	-.12	-.04	.03	-.12	-.12	-.07	.08	.11	.16	.11	.01	-.01
28. Strict Parenting	-.13	.02	.06	.16	.05	.05	-.05	.02	-.03	.06	-.01	.01	.07	-.11	-.07	-.07	-.03	-.11	-.05	.05	.02	-.05	.07	.01	.01	-.01
29. Family Social Support	.17	.28	-.16	-.33	-.26	-.18	.21	.09	.17	-.01	.02	.05	.07	.20	.09	.15	.03	.24	.22	.13	-.20	-.07	-.31	-.21	-.25	-.01
30. Parent-Adolescent Communication	.02	.09	-.06	-.06	.01	-.15	.05	.32	.07	-.05	.03	.07	.11	.01	.07	.11	.05	.11	.16	.05	.01	-.16	-.06	-.12	-.16	-.01
31. Positive Identification With Parent	.19	.12	-.08	-.15	-.06	-.16	.22	.08	.03	-.02	-.01	-.01	.03	.06	.01	.04	-.01	.18	.24	.18	-.06	-.07	-.15	-.12	-.09	-.01
32. Peer Communication	-.04	.18	.12	.04	.10	-.09	.22	.37	-.08	.04	.03	.05	.02	.10	.17	.20	-.07	.00	.02	.01	.01	.02	-.01	.04	.09	-.01
33. Peer Support	.00	.14	-.01	-.06	.07	-.03	.14	.22	.06	.06	-.10	-.01	.04	.18	.09	.14	.04	.16	.14	.17	.02	.00	-.04	-.02	.04	-.01
34. Positive Peers	.02	.21	-.03	-.13	-.02	-.24	.18	.18	.06	.10	.01	.00	-.02	.07	.17	.20	.07	.26	.22	.25	-.22	.07	-.18	-.16	-.12	-.01
35. Negative Peers	-.15	-.06	.27	.31	.24	.45	-.04	.04	-.11	.06	-.02	.07	.02	-.05	-.08	-.04	-.01	-.24	-.14	-.18	.32	.08	.36	.30	.29	-.01

Table 4

Correlations among Wave 3 Measures for European American Adolescents

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1. Self-Esteem	1.00	.48	-.43	-.60	-.52	-.30	.03	-.06	-.13	-.14	-.10	.21	.09	.19	.08	.31	.33	.22	-.12	-.35	-.19	-.23	.05	-.27	-.01
2. Resiliency	.38	1.00	-.44	-.43	-.23	-.35	.05	-.09	-.14	-.30	-.13	.38	.16	.26	.02	.33	.47	.23	-.19	-.17	-.32	-.26	-.09	-.12	-.01
3. Anger	-.18	-.38	1.00	.54	.31	.32	-.17	.14	.13	.26	.15	-.28	-.14	-.18	.05	-.23	-.18	-.18	.29	.25	.37	.27	-.09	.27	-.01
4. Depressive Affect	-.44	-.23	.39	1.00	.40	.30	-.06	.10	.19	.18	.12	-.20	-.19	-.21	.02	-.28	-.18	-.14	.25	.29	.24	.20	.09	.22	-.01
5. Eating Disorders	-.40	-.13	.24	.35	1.00	.21	-.02	.02	.03	.18	.08	-.10	-.02	-.07	-.02	-.19	-.21	-.15	.18	.30	.19	.25	.09	.14	-.01
6. Negative Chances	-.06	-.20	.32	.01	-.04	1.00	-.04	.18	.02	.09	.03	-.41	.00	-.22	-.02	-.16	-.10	-.18	.34	.42	.28	.47	.04	.10	-.01
7. Same R/E Friends	.19	.14	-.14	.02	-.21	.08	1.00	-.84	-.06	-.08	-.14	-.07	-.01	-.02	.03	-.16	-.09	.02	-.06	.01	-.01	.08	.06	-.01	-.01
8. Cross R/E Friends	-.11	-.07	.20	-.04	.30	.03	-.77	1.00	.09	.06	.13	.00	-.02	-.01	.01	.11	.01	-.05	.11	-.01	.04	-.07	-.04	.00	-.01
9. Expected R/E Discrimination	-.14	-.15	.17	.07	.18	.04	-.18	.09	1.00	.39	.55	-.14	-.13	-.32	-.09	-.07	-.01	.02	-.05	-.10	.04	-.01	-.07	.12	-.01
10. John Henryism	-.14	-.23	.29	.19	.24	-.07	-.18	.14	.25	1.00	.36	-.26	-.06	-.12	-.01	-.23	-.20	-.14	.19	.14	.24	.07	-.06	.17	-.01
11. Parent Worries about Discrimination	-.05	-.08	.15	.19	.23	.02	-.13	.11	.37	.12	1.00	-.15	-.10	-.06	-.01	-.05	.09	-.06	.09	.08	.09	.03	-.07	-.02	-.01
12. GPA	.18	.30	-.35	-.21	-.34	-.22	.25	-.30	-.32	-.22	-.09	1.00	.15	.33	.00	.22	.37	.17	-.24	-.35	-.29	-.22	.10	.05	-.01
13. Educational Aspirations	.20	.17	-.20	-.14	-.09	-.03	.07	-.06	-.19	.00	-.18	.26	1.00	.68	.17	.24	.28	.16	-.13	-.20	-.17	.00	-.11	-.04	-.01
14. Educational Expectations	.23	.27	-.23	-.05	-.13	-.13	.16	-.17	-.22	-.12	-.09	.33	.77	1.00	.20	.20	.35	.14	-.10	-.17	-.22	-.09	-.08	-.05	-.01
15. Occupational Aspirations	-.04	.02	-.16	-.06	-.16	.05	.17	-.16	-.13	-.04	-.16	.01	.22	.17	1.00	.08	.10	.13	.05	-.14	.05	-.06	-.21	-.01	-.01
16. Academic Importance	.26	.23	-.26	-.24	-.07	-.29	-.07	.02	-.12	-.10	-.08	.22	.11	.12	.10	1.00	.61	.27	-.18	-.34	-.27	-.32	.00	-.10	-.01
17. Academic Self-Concept	.41	.30	-.42	-.39	-.20	-.37	.06	-.14	-.18	-.16	-.03	.45	.28	.36	.04	.56	1.00	.27	-.17	-.23	-.36	-.27	-.08	.00	-.01
18. Positive School Identification	.25	.27	-.33	-.20	.11	-.23	-.07	.05	-.02	-.15	-.11	.03	.23	.16	.19	.29	.31	1.00	-.20	-.24	-.24	-.17	-.10	.08	-.01
19. School Problems	-.11	-.07	.27	.14	.02	.39	-.04	.06	.02	.07	-.02	-.20	-.15	-.14	-.05	-.25	-.29	-.22	1.00	.47	.62	.57	.31	.04	-.01
20. Cigarette Use	-.10	.01	.20	.08	.14	.35	.08	.05	-.06	.03	.01	-.21	-.08	-.06	.02	-.06	-.28	-.18	.45	1.00	.34	.61	.31	.12	-.01
21. Delinquent Behaviors	-.18	-.13	.29	.09	.01	.41	-.14	.09	.00	.16	.02	-.27	-.11	-.07	.02	-.13	-.32	-.18	.68	.51	1.00	.51	.27	-.01	-.01
22. Alcohol Use	-.02	.00	.26	.05	.04	.44	.14	-.05	.08	-.01	.00	-.24	.02	.03	.07	-.13	-.21	-.19	.50	.60	.58	1.00	.47	.10	-.01
23. Marijuana Use	-.07	.03	.20	-.08	.10	.28	.08	.15	-.10	.04	-.07	-.31	.01	-.02	.00	-.10	-.25	-.16	.40	.74	.53	.69	1.00	-.01	-.01
24. Intrusive Parenting	-.30	-.32	.36	.25	.16	.20	-.09	.08	.09	.04	.17	-.12	-.10	-.11	-.13	-.19	-.29	-.27	.12	.05	.13	.12	.13	1.00	-.01
25. Negative Interactions with Parent	-.18	-.17	.20	.29	.17	.21	-.03	-.01	.10	.13	.10	-.07	.00	-.04	-.10	-.08	-.13	-.17	.14	.07	.16	.15	.05	.48	1.00
26. Strict Parenting	-.07	-.06	.00	-.01	.00	.07	-.06	.00	.03	-.08	.10	.06	-.01	-.08	-.08	-.04	-.04	.00	.14	.01	.10	.02	.18	.33	-.01
27. Family Social Support	.48	.42	-.22	-.36	-.15	-.19	.01	.05	-.14	-.20	-.07	.14	.11	.07	-.02	.34	.38	.18	-.23	-.15	-.19	-.17	.02	-.21	-.01
28. Parent-Adolescent Communication	.20	.15	-.05	-.18	.05	-.14	-.08	.08	.17	.11	.19	-.01	.04	-.03	-.05	.14	.16	.30	-.12	-.08	-.15	-.19	-.08	-.21	-.01
29. Positive Identification With Parent	.27	.19	-.13	-.25	.03	-.22	.06	-.08	-.01	.10	.05	.11	.08	.06	-.10	.24	.21	.20	-.14	-.12	-.07	-.16	-.12	-.42	-.01
30. Peer Communication	.11	.07	.05	-.10	.02	-.03	-.17	.16	.04	.07	.11	.06	.08	.06	.05	.01	.14	.23	-.02	-.06	.00	-.09	-.05	.03	-.01
31. Peer Support	.17	.02	-.12	-.16	-.04	-.09	-.01	.03	.02	.02	-.03	-.01	.21	.20	.14	.20	.24	.26	-.07	-.08	-.11	-.15	-.22	.06	-.01
32. Positive Peers	.12	.28	-.29	-.17	.08	-.35	.09	-.08	-.03	-.03	-.07	.18	.29	.28	.08	.36	.37	.45	-.27	-.07	-.20	-.11	-.06	-.20	-.01
33. Negative Peers	-.16	-.21	.47	.19	.14	.59	.00	.14	.10	.11	.13	-.30	-.20	-.20	-.12	-.26	-.38	-.37	.47	.49	.44	.44	.46	.07	-.01
34. Peer Disapproval	-.07	-.06	.20	.12	.03	.51	.11	.01	.02	.02	.04	-.10	-.11	-.10	-.02	-.24	-.20	-.23	.27	.28	.29	.41	.21	.20	-.01

Table 5

## Invariance Tests for R/E Discrimination Measures

	df	$\chi^2$		CFI	$\Delta df$	$\Delta \chi^2$	$\Delta CFI$
<b>Configural</b>							
R/E Measures—Gender	12	21.67	***	.996			
R/E Measures--Ethnicity	12	25.15	***	.993			
<b>Weak</b>							
Expected R/E Discrimination--Gender	13	26.61	***	.994	1	4.94	-.002
Expected R/E Discrimination--Ethnicity	13	29.72	***	.991	1	4.57	-.002
R/E John Henryism—Gender	13	22.00	***	.996	1	.33	.000
R/E John Henryism--Ethnicity	13	25.32	***	.993	1	.17	.000
Parents' Worries about Discrimination-- Gender	13	21.71	***	.996	1	.04	.000
Parents' Worries about Discrimination-- Ethnicity	13	41.00	***	.984	1	15.85	*** -.009
<b>Strong</b>							
Expected R/E Discrimination--Gender	15	29.98	***	.994	2	8.31	-.002
Expected R/E Discrimination--Ethnicity	15	247.31	***	.870	2	222.16	*** -.123
R/E John Henryism--Gender	15	33.68	***	.992	2	12.01	*** -.004
R/E John Henryism--Ethnicity	15	288.88	***	.847	2	263.73	*** -.146
Parents' Worries about Discrimination— Gender	15	22.55	***	.997	2	.88	.001
Parents' Worries about Discrimination-- Ethnicity	15	225.47	***	.882	2	200.32	*** -.111

Note. Because our R/E discrimination measures each have two or three indicators, we grouped these measures together in separate race/ethnicity and gender configural models, for identification purposes. \*\*\* $p < .001$ .

Table 6

## Item-Level Means for the R/E Discrimination Measures

Gender	R/E				
	Male	Female	African F-Test American	European American	F-test
Race/Ethnicity:					
Expected R/E Discrimination					
			1.87	1.23	(1, 936) = 80.45***
	1.78	1.87	(1, 936) = .77		
			2.10	1.30	(1, 936) = 61.60***
	1.65	1.65	(1, 936) = 2.32		
R/E John Henryism					
			2.50	1.58	(1, 926) = 103.37***
	2.17	2.18	(1, 926) = .34		
			2.52	1.61	(1, 926) = 103.96***
	2.28	2.13	(1, 926) = 2.85		
Parents' Worries about Discrimination					
			2.02	1.70	(1, 933) = 8.70***
	1.94	1.87	(1, 933) = .91		
			2.35	1.46	(1, 933) = 63.04***
	2.05	2.02	(1, 933) = .22		

Note. \*\*\* $p < .001$