Validation and Examination of the Educational Benefits of Informal Interactional Diversity Using a National Sample of Incoming Black Law Students

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ABSTRACT

RACHEL D. UPTON: Validation and Examination of the Educational Benefits of Informal Interactional Diversity Using a National Sample of Incoming Black Law Students
(Under the direction of A. T. Panter)

This dissertation research is comprised of two studies aimed at exploring the conceptual meaning, measurement properties, and the influence of informal interactional diversity (IID) on Black undergraduates. Specifically, Study 1 used a volunteer sample and a national sample of Black college students entering their first year of law school to investigate the factor structure of IID and to determine whether measurement equivalence exists for Blacks who attend undergraduate historically Black colleges and universities (HBCUs) or undergraduate traditionally White institutions (TWIs). In Study 2, exploratory conceptual models were utilized to assess within-group heterogeneity among Black students with respect to the means with which IID and perceptions of racial discrimination were associated with students’ self-reported academic engagement and beliefs regarding the educational benefits of diversity. Exploratory models were also used in Study 2 to assess whether IID mediated and moderated the impact of racial discrimination on students’ academic engagement and diversity-related beliefs. Data were drawn from a volunteer sample and from the Educational Diversity Project, which is a national, longitudinal, and multi-method research study of law school students. In the first study, results from exploratory factor analysis and multilevel confirmatory factor analysis models indicated that contrary to prediction, only four out of six items derived
from prior studies used to investigate the academic advantages of IID had statistically
significant factor loadings. Results from multiple group multilevel CFA models also
revealed that partial measurement equivalence was established among former HBCU and
TWI students. Overall, findings suggested that measures of IID examined in previous
studies may not have the same factor structure or conceptual meaning for Black
undergraduates, and that further research is needed to generate improved measures of IID
for Blacks collegians and students from other racial groups. In Study 2, results showed
that as predicted, a revised measure of IID was positively associated with students’
reported level of academic engagement and positive diversity beliefs, above and beyond
perceptions of racial discrimination. Contrary to predictions, findings also revealed
indirect relationships between perceptions of racial discrimination and the two study
outcomes through IID, whereby students with discriminatory experiences reported high
levels of IID, which in turn, were associated with enhanced engagement and beliefs in
favor of diversity.
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# TABLE OF CONTENTS

I. General Introduction .........................................................................................1

1.1 Informal Interactional Diversity (IID) and Prior Research .................4

1.2 Theoretical Foundations of IID .................................................................8

1.3 Gaps and Limitations in Prior Research ...............................................9

1.4 Overview of Chapters .............................................................................16

II. Study 1: Examining Measurement Equivalence, the Factor Structure and Reliability of an Integrated Measure of Informal Interactional Diversity Using a National Sample of Incoming Black Law Students .........................................................19

2.1 Introduction .............................................................................................19

2.1.1 College Racial Composition ..............................................................22

2.2 Proposed Research Questions and Hypotheses ...............................24

2.3 Sample and Participants .......................................................................25

2.4 Procedure ...............................................................................................27

2.5 Data Analyses .........................................................................................28

2.5.1 Multilevel Factor Models ................................................................29

2.5.2 Examining Categorical Indicators ..................................................32

2.5.3 Testing Alternative Multilevel Factor Models ...............................36

2.6 Results ....................................................................................................43

2.7 Discussion ...............................................................................................51
III. Study 2: Investigating the Relationship Between Perceptions of Racial Discrimination and Informal Interactional Diversity on Black College Students’ Educational Outcomes and Beliefs Regarding Diversity

3.1 Introduction

3.1.1 IID as a Mediator and Moderator of Perceived Racial Discrimination

3.1.2 Racial Composition of Students’ College Environment

3.2 Proposed Research Questions and Hypotheses

3.3 Sample and Participants

3.4 Procedure

3.5 Measures

3.6 Analysis Plan

3.7 Results

3.8 Discussion

IV. General Conclusions

References
**LIST OF TABLES**

Table 2.1. Correlations and Descriptive Statistics: EDP Volunteer Sample………………..94
Table 2.2. Correlations and Descriptive Statistics: EDP Core Sample…………………….94
Table 2.3. Demographics of Black Students in Volunteer and EDP Core Samples……….95
Table 2.4. Demographic Characteristics for Racial Groups in the EDP Core Sample…..96
Table 2.5. ML EFA Results from the Volunteer Sample…………………………………….96
Table 2.6. Correlations and IID Factor Scores Using the Volunteer Sample……………..97
Table 2.7. Single-level CFA Using the EDP Core Sample and MLR Estimation………..98
Table 2.8. Variance Components Measurement Model Using MLR Estimation……….100
Table 2.9. Results from Partially Invariant Multiple Group Multilevel Model……….102
Table 3.1. Correlations and Descriptive Statistics of Revised IID Scale and Other Study
Variables…………………………………………………………………………………………104
Table 3.2. Demographic Characteristics of Black Students Across HBCUs and
TWIs……………………………………………………………………………………………105
Table 3.3. Results for Model 1: Unstandardized Regression Coefficients, Standard Errors,
and R-Square……………………………………………………………………………….106
Table 3.4. Results for Model 2: Unstandardized Regression Coefficients, Standard Errors,
and R-Square……………………………………………………………………………….107
LIST OF FIGURES

Figure 2.1. Scree Plot of Four-Item IID Scale Using the Volunteer Sample……………108

Figure 2.2. Single-level IID Measurement Model………………………………………………109

Figure 2.3. Between and Within IID Measurement Model……………………………………110

Figure 2.4. Variance Components IID Measurement Model…………………………………111

Figure 3.1. Hypothesized Path Analysis Model Representing the Mediating and Moderating Impact of IID on Perceptions of Racial Discrimination………………112

Figure 3.2. Results for Path Analysis Examining the Mediating and Moderating Impact of IID on Unfair Treatment…………………………………………………….113

Figure 3.3. Results for Path Analysis Examining the Mediating and Moderating Impact of IID on Perceptions of Racial Discrimination……………………………………114

Figure 3.4. Alternate Path Analysis Examining the Mediating and Moderating Impact of Perceptions of Racial Discrimination on IID………………………………………115
General Introduction

Research indicates that compared to Whites and college students from other racial groups, Black students in the U.S. enter college with lower grade point averages and have higher postsecondary attrition rates (Jencks & Phillips, 1998; Lucas & Berends, 2007). Despite disparities in Black college students’ educational success and attainment, recent census reports suggest that by the year 2030, nearly half the U.S. population will consist of racial and ethnic minorities (Pike & Kuh, 2006). Most colleges and universities are also becoming increasingly diverse, such that Blacks and other minority students who attend institutions that utilize race-sensitive admissions policies are likely to comprise almost two-fifths of undergraduate enrollments by the year 2015 (Pike & Kuh, 2006). Given these dramatic demographic shifts, university administrators often consider diversity to be an integral part of a well-rounded education, and many U.S. colleges seek to provide an equitable campus environment that eliminates racial disparities in education by fostering high achievement among Blacks and other minorities and by teaching all students to value diversity (Ervin, 2001).

Since the time of the 1954 Brown v. Board of Education U.S. Supreme Court Case and the subsequent era of forced desegregation, research has shown that factors such as academic preparedness (e.g., student grade point averages, ACT and SAT scores, and so on), racial discrimination, and college racial composition influence Black college students’ academic success (Allen, 1992; Allen & Jewell, 2002; Allen & Solórzano, 2001; Branscombe, Schmitt, & Harvey, 1999; Ervin, 2001; Flowers & Pascarella, 1999;
Greer, 2008; Greer & Chwalisz, 2007; Harper, 2009; Jencks & Phillips, 1998; Solórzano, Ceja, & Yosso, 2000; Strayhorn, 2010). Yet few researchers have investigated whether racial diversity plays a significant role in predicting Black students’ educational outcomes. One particular factor that researchers have not assessed when looking at Black undergraduates’ educational outcomes is informal interactional diversity (Strayhorn, 2010). Informal interactional diversity (IID) is defined as the “frequency and the quality of intergroup interactions” (Gurin, Dey, Hurtado, & Gurin, 2002, p. 333).

According to Shaw (2005), there are three components or forms of diversity that researchers use to investigate its educational benefits. The first method is structural diversity, which refers to students’ contact with diverse groups through the numerical or proportional representation of racial diversity on college campuses. The second method, curricular diversity, examines diversity through institutionally structured programs or curricula (e.g., course work, multicultural education programs, and multicultural awareness workshops). The third method is IID, or diversity interactions, which works under the assumption that there is a minimal amount of racial diversity on college campuses and operationalizes diversity using the frequency or nature of students’ interactions with individuals from different racial or ethnic groups (Shaw, 2005). An emerging body of research shows that irrespective of students’ racial or ethnic background, IID is positively related to college students’ intellectual development, academic achievement, and openness to racial and ethnic diversity (Antonio, 2001; Flowers & Pascarella, 1999; Gurin et al., 2002; Pike & Kuh, 2006). Research also suggests that IID increases college students’ academic engagement and perspective-taking ability, and that frequent contact with individuals from diverse backgrounds is

Because of increasing racial and ethnic diversity on many college campuses, it is important for researchers to shed light on the means with which IID is related to Black college students’ educational outcomes (Strayhorn, 2010; U.S. Department of Education, 2007). Understanding the role that IID plays in terms of impacting these students’ educational outcomes is also noteworthy, as increased academic success among this population will help to ameliorate the social and economic consequences associated with low academic achievement (e.g., poverty, unemployment, high levels of incarceration, having a diminished pool of qualified minority academics and professionals that is proportionally equivalent to the number of minorities in the U.S., etc.), and reduce the need for affirmative action in university admissions (Jencks & Phillips, 1998).

In addition to assessing the influence of IID on Black college students’ educational success, another outcome of interest in the present study is college students’ beliefs regarding the educational benefits of diversity in higher education. Evaluating educational outcomes in college deals with student behaviors, whereas reports concerning the educational benefits of racial or ethnic diversity pertain to students’ attitudes, and whether racial/ethnic diversity is valuable to students. Notwithstanding the differences between these two outcomes (i.e., students’ educational outcomes compared to student beliefs regarding the educational benefits of diversity), investigating Black undergraduates’ diversity-related beliefs is important because these individuals represent the country’s future Black leaders and professionals. Increasing Black college students’
endorsement of diversity in higher education is also important because these individuals are expected to successfully operate within an increasingly multicultural, global society that is highly diverse in terms of race, ethnicity, language, and culture (Ervin, 2001; Hurtado, Milem, Clayton-Pederson, & Allen, 1999; Strayhorn, 2010). Moreover, past research has found that when students are exposed to curricular diversity or multicultural education and learn to value a variety of diverse perspectives, this knowledge is likely to increase students’ self-esteem and remedy educational failure among students of Color (Ervin, 2001).

1.1 Informal Interactional Diversity (IID) and Prior Research

Little research has investigated the impact of IID on Black college students’ educational outcomes or beliefs regarding the educational benefits of diversity (Strayhorn, 2010). Several studies suggest that IID may occur in the traditional classroom, though most research has shown that IID mainly takes place outside of class through student discussions, interactions in campus residence halls, and social activities (Gurin et al., 2002). Most studies on IID are framed in terms of Allport’s contact theory, which posits that prejudicial attitudes are reduced when individuals work together to achieve a common goal and are consistently exposed to members of out-groups who differ with respect to race, ethnicity, or culture (Allport, 1954; Antonio, 2001; Pettigrew & Tropp, 2006). The theory states that, over time, frequent contact with others under certain conditions allows a person to challenge prejudicial attitudes and to shift individual focus from between-group differences to a sense of communality and shared objectives (Pettigrew, 1998).
Allport’s theory specifies four conditions for optimal intergroup contact or IID (Antonio, 2001; Pettigrew, 1998). The first three conditions are that individuals from different racial, ethnic, or cultural groups have equivalent status or social standing in a given situation, that individuals work to obtain common goals, and that there is cooperation among members from different out-groups. Allport (1954) postulated that the fourth condition occurs when students interact in an environment where contact is supported by law, custom, or those in positions of authority, such as when university officials strongly endorse multicultural education (Allport, 1954; Antonio, 2001; Pettigrew & Tropp, 2006; Tropp, 2007). Additionally, Pettigrew and Tropp (2006) performed a meta-analysis of 515 studies that examine the relationship between intergroup contact and racial attitudes and found that, irrespective of participants’ racial background or whether optimum conditions for intergroup contact were met, intergroup contact reduced prejudice and increased positive attitudes toward out-groups.

Past research has examined IID or intergroup contact as a factor that aids in eliminating prejudice. However, a relatively small, yet significant body of literature has also found that IID provides a number of educational benefits for students from different racial and ethnic groups. (Antonio, 2001; Antonio, Chang, Hakuta, Kenny, Levin, & Milem, 2004; Chang, 2002; Gurin, 1999; Gurin et al., 2002; Hu & Kuh, 2003; Hurtado, 2005; Pettigrew & Tropp, 2006; Whitt, Edison, Pascarella, Terenzini, & Nora, 2001). Research conducted by Gurin (1999), in particular, was used as evidence in support of affirmative action in the cases of Grutter v. Bollinger (see Shaw, 2005). In the landmark case of Grutter v. Bollinger (2003), the U.S. Supreme Court upheld the affirmative action policies of the University of Michigan Law School because the court found that racial
diversity benefits all students by enabling educational achievement and civic responsibility.

Gurin (1999) and Gurin et al. (2002) analyzed data from the University of Michigan’s Michigan Student Study (MSS) and the Cooperative Institutional Research Program (CIRP). Findings from Gurin (1999) indicated that students who experience high levels of informal interactions with people from diverse backgrounds display increases in academic skills, have more active thought processes, and grow in their intellectual engagement and motivation. Using MSS and CIRP data, Gurin et al. (2002) found that, across different racial groups, IID enhances students’ level of intellectual engagement, self-reported academic skills, and overall concern for racial and cultural issues. The MSS data assessed in Gurin (1999) and Gurin et al. (2002) were created to document student responses to the University of Michigan’s diversity focus and included students who entered the University of Michigan in 1990, along with a follow-up survey conducted four years later. Gurin’s sample was comprised of 1,129 White students, 187 Black students, and 266 Asian American students (Native American and Hispanic/Latino students were not included because of their small sample sizes). During the time of the MSS, 92 percent of White students and 52 percent of Black students in the study came from racially segregated communities where they represented the majority ethnic group (Shaw, 2005). Alternatively, the CIRP is a national survey conducted by the Higher Education Research Institute (HERI) that includes: 10,465 Whites, 216 Blacks, 496 Asian Americans, and 206 Hispanic/Latino students who were surveyed upon entering college in 1985, and again, four years later. All students examined in the CIRP survey attended predominantly White, four-year institutions (Shaw, 2005).
Another major study examining student outcomes related to diversity was conducted by Huh and Kuh (2003). This particular study used items from the College Student Experiences Questionnaire (CSEQ) to create an interactional diversity scale to investigate the impact of students’ contact with peers from different racial backgrounds (see Shaw, 2005). The CSEQ data set included 53,756 undergraduates enrolled full-time at 124 U.S. four-year colleges and universities, and, CSEQ items were completed between 1998 and 2001. Sixty-three percent of the CSEQ participants were women and 77.0% were White, 8.5% were Asian or Pacific Islander, 5.2% were African American, 5.1% included American Indian and those who did not report their ethnic identity, and 4.1% were Hispanic. Approximately 45% of the CSEQ participants were first-year students, 21% sophomores, 17% juniors, and 17% seniors (Hu & Kuh, 2003).

Study results from Hu and Kuh indicated that White students typically had less contact with peers from different backgrounds, although both White and racial minority students appeared to experience academic gains from interactional diversity. Interactional diversity is a construct that is similar in nature to IID, except that measures of interactional diversity are generally created to focus on interactions with individuals from other countries, religious beliefs, and philosophies in addition to studying the frequency with which student interact with individuals from diverse racial backgrounds (Hu & Kuh, 2003). What is more, despite minor differences between IID and similar constructs (e.g., intergroup contact, contact diversity, interactional diversity, interracial contact, interracial interactions), past research suggests that these measures help to facilitate intellectual growth and academic engagement among Whites and other racial groups (Antonio, 2001; Chang, 1999; Gottfredson et al., 2008; Hurtado, 2005; Shaw, 2005).
1.2 Theoretical Foundations of IID

Gurin et al. (2002) generated a theoretical framework based on Allport’s (1954) contact theory, Erikson’s theory of identity development, and literature rooted in cognitive development and social psychology that many researchers utilize to describe the influence of IID on students’ educational outcomes. According to Gurin et al. (2002), the underlying premise used to connect diverse interactions (IID) with students’ educational outcomes is that individuals cognitively rely on stereotypes, habits, and routine ways of thinking to dominate their worldview, and that the impact of diversity on educational outcomes is particularly important during the college years, because it is a time that many students are at a critical developmental stage (Gurin et al., 2002; Hurtado, 2005). Based on Erikson’s (1946, 1956) work, many students enter higher education during “psychosocial moratorium.” Psychosocial moratorium is defined as a time during the college years when middle and upper class youth have the opportunity to be influenced by a diverse group of peers and experiment with different social roles prior to making any permanent commitments to occupations, social and political attitudes, or lifelong philosophies (Gurin et al., 2002).

Gurin et al. (2002) argued that universities enhance educational outcomes by exposing students to novel people, situations, and experiences that force them to reconsider familiar ways of thinking, which in turn, encourages intellectual growth (Gottfredson et al., 2008; Gurin et al., 2002; Hurtado, 2005). Exposure to diversity promotes a broad range of educational outcomes, which are divided into two categories. The first category is defined as learning outcomes and includes active thinking skills, intellectual engagement and motivation, and academic skills. The second category
consists of democracy outcomes, which include perspective-taking, citizenship engagement, racial and cultural understanding, and judgment of compatibility among different groups in a democracy.

Examining the effects of IID in higher education is particularly important because the college years are also hypothesized to provide “disequilibrium” or discontinuity between the home environment in which college students are reared and students’ life as adults seeking independence. According to Gurin et al. (2002), the college years spur cognitive skills and perspective-taking because a diverse college campus often provides a very different environment compared to the racially segregated communities and schools in the U.S. with which many college students have grown up and become accustomed (Gurin et al., 2002). Thus, a racially diverse college campus is likely to provide both the psychosocial moratorium and divergent environment or disequilibrium that students need to foster learning and democratic outcomes, as well as increase students’ openness towards diversity. A racially diverse campus that promotes interactions among students from different races is also likely to provide experiences that challenge students’ pre-existing views and routine ways of thinking, thereby compelling them to consider other values, cultures, and ideas (Gurin et al., 2002).

1.3 Gaps and Limitations in Prior Research

Despite the growing body of research concerning the educational benefits of diversity, several researchers suggest that the current methods used to assess the academic advantages of IID are limited. Richeson and Shelton (2007) and Hurtado (2005), for example, argued that previous studies overemphasize the frequency of student interactions with individuals from different racial or ethnic backgrounds. Indeed, prior
studies are often criticized for not accounting for whether students perceive interracial interactions as positive and productive or as negative and stressful (Hurtado, 2005; Richeson & Shelton, 2007).

A second criticism about diversity research is that they commonly confuse correlation with causation. More specifically, several researchers have contended that students who are prejudiced generally avoid interactions with other races, whereas students who are not prejudiced purposely seek interactions with other races, and consequently benefit more richly from IID (Gottfredson et al., 2008; Richeson & Shelton, 2007). To address this issue, Powers and Ellison (1995) used econometric modeling techniques to compare causal models and found evidence to support the proposed directionality of contact theory, where IID is treated as a predictor of student’s educational outcomes or diversity beliefs. Therefore, based on Allport’s contact theory and results from Powers and Ellison (1995) many researchers focus on empirical analyses that directly test whether IID is a significant predictor of students’ educational outcomes, prejudicial attitudes, and beliefs regarding the educational benefits of diversity.

A third criticism is that diversity researchers over utilize predominantly White college samples and race-comparative studies to evaluate the academic advantages of IID (Strayhorn, 2010). In fact, the studies conducted by Gurin (1999), Gurin et al. (2002), Hu and Kuh (2003), and Antonio (2001) reported results based on samples that are mainly comprised of White students. Findings from Hu and Kuh (2003) were also based on multiple regression analyses with statistical control variables to differentiate among racial groups. Using statistical controls or dummy variables to partition the amount of variance of an outcome that is due to race is often atheoretical. Utilizing race-comparative studies
(and predominantly White college samples) is also potentially problematic, because this approach tends to ignore within-group heterogeneity among Black students and increases the risk of generalizing results across separate groups (McLoyd & Steinberg, 1998).

An alternative to using race-comparative studies to evaluate the impact of IID on Black college students’ academic outcomes and diversity beliefs is to utilize a within-group design. Within-group designs are studies that focus on a single racial or ethnic group, or on several groups that are considered to be a unit, such as Asian Americans (McLoyd & Steinberg, 1998). Often, there is greater variability within racial groups than between them, and using within-group designs provides several advantages over race-comparative studies (McLoyd & Steinberg, 1998). Within-group designs are particularly useful because they allow researchers to examine a racial group on its own terms and provide the opportunity to address issues and experiences that are unique to a specific group (McLoyd & Steinberg, 1998). One experience that is unique to Black college students compared to their White peers is perceptions of racial discrimination. According to West, Donovan, and Roemer (2010), racial discrimination is defined as perceptions of negative treatment based on one’s race. Several studies indicate that IID and racial discrimination generally go hand in hand, such that Black students who attend predominantly White institutions and have high levels of contact with Whites or other racial groups often report experiences and perceptions of racial discrimination (Allen, 1992; Allen & Solórzano, 2001; Forbes, 1997; Utsey, Ponterotto, Reynolds, & Cancelli, 2000). Past research also suggests that perceptions of experienced racial discrimination generally undermine Black college students’ educational outcomes, positive diversity beliefs, and willingness to identify or feel a sense of belonging with Whites and other
racial groups (Allen, 1992; Ervin, 2001; Greer & Chwalisz, 2007; Solórzano, Ceja, & Yosso, 2000; West et al., 2010).

A large body of research has examined the negative impact of racial discrimination on Black college students’ academic success, yet less is known about whether IID potentially mediates and/or moderates the relationships between racial discrimination with students’ educational outcomes and beliefs regarding the educational benefits of diversity. On the whole, no research has investigated within-group heterogeneity with respect to the means with which some Black students are academically successful and embrace racial diversity despite experiences of discrimination, while others do not. Based on the rejection-identification model proposed by Branscombe et al. (2000), perceptions of racial prejudice are commonly interpreted as rejection by the dominant group, which results in a direct and depreciatory effect on psychological well-being. Branscombe et al. (1999) further contended that to alleviate the harmful effects of racial discrimination and social rejection, Blacks and other minorities identify more with their particular in-group to reduce feelings of alienation and to protect their sense of well-being (Branscombe et al., 1999). Similar results from a 2000 study by Solórzano and colleagues indicated that Black college students often experience social exclusion and daily racial microaggressions or subtle, derogatory insults based on race. Solórzano et al. (2000) also found that one way to buffer against the harmful effects of discrimination and racial microaggressions is for Black college students to form “counterspaces,” or predominantly Black academic and social groups to circumvent experiences of prejudice.
In addition to the rejection-identification model, another useful theoretical framework is Lazarus and Folkman’s transactional model of stress and coping (1984). The transactional model posits that stress is generated through an interaction of a person with the environment. More specifically, stress is theorized to be produced when there is a lack of congruency between an individual and the environment, such that an individual perceives that the demands of a situation exceed one’s available resources (Lazarus & Folkman, 1984). Greer and Chwalisz (2007) stated that when applying the transactional conceptualization to the academic experiences of Black college students, both college environment and background characteristics (e.g., race, sex, past experiences of discrimination) are likely to interact to influence students’ outcomes. Recent studies have also utilized the transactional model to examine the ways racial discrimination, in particular, becomes stressful (Greer, 2011; Greer et al., 2009; Harrell, 2000; Utsey et al., 2000).

Given the relationships described in the rejection-identification model (Branscombe et al. 1999) and the transactional model (Lazarus & Folkman, 1984), it is plausible that mediation exists, such that students who experience high levels of perceived racial discrimination avoid interacting with non-Blacks as a strategy to escape further discriminatory events. Low levels of IID or avoiding interactions with non-Blacks, in turn, may undermine Black college students’ academic engagement and diversity-related beliefs, because low levels of IID could cause Black students to miss out on important networking and student learning opportunities with individuals from other racial groups. In other words, Black college students are likely to cope with stress stemming from perceptions of racial discrimination and a lack of fit within their college
environment by identifying with their specific in-group and developing counterspaces to maintain their psychological well-being (Branscombe et al., 1999; Harper & Hurtado, 2007; McCabe, 2009; Solórzano et al., 2000). Moreover, limiting one’s willingness to identify or even interact with Whites and other racial groups by creating counterspaces might cause Black collegians to not participate in valuable, informal social learning and professional development opportunities.

A final gap or limitation in prior research is that no studies have utilized tests to determine whether measurement equivalence holds for IID among Blacks in college. Measurement equivalence or measurement invariance (ME/I) is defined as “the degree to which measurements conducted under different conditions yield equal measures of the same attributes” (Meade & Bauer, 2007, p. 611). When ME/I exists Black college students with identical factor scores on a given measure are expected to have identical observed scores, regardless of their gender, age, college racial composition, or ethnic group membership. Traditional approaches such as t tests, ANOVA, MANOVA, multiple linear regression, and hierarchical linear modeling are generally used to examine differences between groups in educational and social science research. However, each of these approaches operates under the assumption of ME/I, and the internal validity of any test of between-group differences depends on whether ME/I holds or if the predictors and outcomes under study operate equivalently across separate groups (Bollen, 1989; Brown, 2006; Vandenberg & Lance, 2000).

Diversity-related studies that are used to assess the educational benefits of IID generally assume that ME/I has been established, IID is conceptually similar among different subsets of Black college students, and that IID benefits all Black students.
equally. Yet ME/I may not hold for measures of IID across separate subsets of Black students, and it is likely that within-group heterogeneity exists, whereby IID does not operate equivalently across certain groups of Black college students. In particular, it is possible that when utilizing a within-group design, measurement non-equivalence exists based on the racial composition of Black students’ college environment, or whether students attend an undergraduate historically Black college and university (HBCU) or an undergraduate traditionally White institution (TWI). Blacks comprise most student enrollments at HBCUs and Black HBCU students generally have lower levels of IID and fewer diversity-related experiences relative to their counterparts at TWIs. Compared to the multiculturalism endorsed at many TWIs, the primary mission of HBCUs is to promote the education of Black Americans and to provide a supportive and interconnected community among Black faculty and students (Freeman & Thomas, 2002; Greer & Chwalisz, 2007).

Unlike their counterparts at TWIs, Blacks who choose to attend HBCUs also are likely to be influenced by a desire to increase their cultural awareness, to seek their ethnic roots, and engage in a curriculum that emphasizes racial consciousness (Allen, 1992; Allen & Jewell, 2002; Freeman & Thomas, 2002). Because Black HBCU students’ motivations for attending college, their on-campus experiences, and diversity-related beliefs may differ substantially from Blacks who attend TWIs, it is possible that ME/I does not exist among Black HBCU and TWI students. Overall, few studies have utilized within-group designs to assess the effects of perceptions of discrimination and IID on Black college students’ academic outcomes and diversity beliefs, and no studies have tested for ME/I across Black HBCU and TWI students. More importantly, before
analyses can be performed to investigate whether IID mediates and/or moderates the relationships between perceived discrimination (or unfair treatment) with Black college students’ academic engagement and beliefs regarding the educational benefits of diversity, ME/I must first be established for IID (and for the study outcomes) to determine whether IID is conceptually similar among Black HBCU and TWI students.

1.4 Overview of Chapters

The purpose of this investigation is to examine the educational benefits of IID for Black college students and to facilitate an increased understanding of the influence of IID on these students’ academic engagement and diversity-related beliefs in relation to perceptions of racial discrimination. Because ME/I must be established for IID (and ME/I must be established for any study outcome) prior to performing additional analyses, in this study I also seek to investigate the measurement properties of IID and to test for factorial invariance (ME/I) to gain a better understanding of the conceptual meaning of IID among Black TWI and HBCU students. Given recent demographic shifts, there is also a need to evaluate IID as a means of promoting Black collegian’s educational success and diversity-related beliefs. Very little is known about the impact of IID on Black college students’ educational outcomes (e.g., students’ level of academic engagement, classroom participation) or their beliefs concerning the academic benefits of diversity in higher education. Furthermore, while there is currently a dearth of research regarding the impact of IID among Blacks in college (Strayhorn, 2010), numerous studies have evaluated the deleterious effects of racial discrimination on Black HBCU and TWI students’ academic success and diversity-related beliefs (Allen, 1992; Allen & Solórzano,
Thus, I conducted two separate studies utilizing theory proposed by Gurin et al. (2002), Branscombe et al. (1999), and Lazarus and Folkman (1984) to investigate the conceptual meaning of IID. In addition, I explored whether IID serves as a mediator as well as a moderator the relationships between perceptions of racial discrimination with Black college students’ educational outcomes and diversity-related beliefs. For Study 1, I addressed several additional issues concerning the methods currently used to define and evaluate IID in higher education. In Study 1 I also used a volunteer sample and a national sample of Black college students entering their first year of law school to investigate the factor structure of IID and to determine whether ME/I exists across Black HBCU and TWI students.

After establishing whether ME/I exists across Black HBCU/TWI students (tests for ME/I are performed in Study 1), in Study 2, I generated exploratory conceptual models to assess within-group heterogeneity among Black students with respect to the means through which IID is associated with students’ self-reported academic engagement and beliefs regarding the educational benefits of diversity in higher education. For Study 2, I also used exploratory conceptual models based on the work of Allen (1992) and Solórzano et al. (2000), the rejection-identification model developed by Branscombe et al. (1999), and the transactional model of stress and coping proposed by Lazarus and Folkman (1984) to investigate whether IID mediates and moderates the relationship between perceptions of racial discrimination and Black college students’ educational outcomes, using a measure representing students’ reported level of academic
engagement. The last set of models in Study 2 additionally tested whether IID mediates and moderates the relationship between perceptions of racial discrimination and Black college students’ beliefs regarding the educational benefits of diversity, while controlling for the racial composition of students’ college environment and other student- and school-level characteristics.
Study 1: Examining Measurement Equivalence, the Factor Structure and Reliability of an Integrated Measure of Informal Interactional Diversity Using a National Sample of Incoming Black Law Students

2.1 Introduction

Past studies show that IID positively influences college students’ psychosocial development, along with students’ educational outcomes and openness to diversity (Antonio, 2001; Antonio et al., 2004; Chang, 1999; Ervin, 2001; Gottfredson et al., 2008; Gurin, 1999; Gurin et al., 2002; Hu & Kuh, 2003; Hurtado, 2005; Shaw, 2005; Strayhorn, 2010). However, notwithstanding the academic gains that IID is purported to provide for Blacks and college students from other racial backgrounds, there is no consensus regarding the best way to measure students’ experiences with IID. The current methods used to examine IID are also limited for several reasons.

The first reason why current methods used to assess IID are limited is because most studies use divergent item sets, and researchers have yet to establish inclusion rules regarding which items to retain or exclude when examining IID or similar constructs (e.g., interactional diversity, interracial interactions, contact diversity, interracial contact, intergroup contact, etc.). Ideally, items should be selected to cover the full domain of a construct, yet the domain of this particular construct is equivocal, especially when considering its domain among Black collegians. Prior research has also failed to determine whether IID or other, related scales should include items pertaining to participation in ethnically related workshops and engaging in discussions regarding race, or if researchers should narrow their focus to items that emphasize interracial interactions.
Researchers additionally have used a number of secondary data sources that are limited in terms of the items they provide, which makes it difficult to operationally define IID and may ultimately compromise the validity of IID scales. An example of studies that have generated diverging sets of items to operationalize IID is provided by Gurin (1999) and Gurin et al. (2002), who used CIRP data to evaluate informal student interactions based on items pertaining to the frequency that students attend cultural awareness workshops, discuss racial issues, and socialize with individuals from a different race. Gurin et al. (2002) also used MSS data, which defines IID using items related to students’ amount of contact with other racial groups, the proportion of best friends from other racial groups a student had, and the amount of positive interactions students had with a racially diverse set of peers (see Gurin et al., 2002).

Another example of using divergent item sets to measure IID and similar constructs (e.g., interactional diversity, interracial interactions, contact diversity, interracial contact, intergroup contact) is provided by Antonio (2001). Antonio (2001) examined interracial interactions and used items that measure the frequency with which students study, dine, have a roommate, or date someone from a different racial or ethnic group. The interactional diversity scale created by Hu and Kuh (2003) assessed six items from the CSEQ data (Shaw, 2005), whereas Strayhorn (2010) used CSEQ data to generate a similar version of the interactional diversity scale based on seven items. The seven items that Strayhorn included to generate the interactional diversity scale measured the frequency with which students become acquainted with individuals from a different country, race, or ethnic background, and the degree to which students had serious
discussions with individuals who differ in terms of their country of origin, religious beliefs, and philosophy. Gottfredson et al. (2008) also used items derived from Antonio (2001) and Gurin et al. (2002) to measure IID or what is referred to as contact diversity, where study items included the frequency that students have roommates, close friends, study, or date individuals from other racial backgrounds. Hence, while past research indicates that IID and other, related constructs are linked to enhancing students’ level of engagement and learning outcomes (Allport, 1954; Antonio, 2001; Antonio et al., 2004; Gurin, 1999; Gurin et al., 2002; Hurtado, 2005; Pettigrew, 1998; Pettigrew & Tropp, 2006; Shaw, 2005) prior studies have examined these constructs using disparate measures.

A second reason why current methods used to assess IID are limited is that previous researchers typically fail to examine the factor structure of measures depicting IID, and most studies have not developed well-defined measures of informal student interactions when attempting to study the educational benefits of diversity. According to Brown (2006), a well-defined measure is comprised of several indicators that strongly relate to the construct they are designed to assess, and is stable across replications. For instance, Chang, Denson, Sáenz, and Misa (2006) and Strayhorn (2010) reported coefficient alpha without performing factor analyses to ensure that the IID scales were unidimensional or well-defined. According to Schmitt (1996), coefficient alpha is not a measure of homogeneity or unidimensionality. Nonetheless, researchers often make the mistake of treating coefficient alpha as the primary means with which to assess the factor structure of a given measure. Furthermore, researchers generally do not examine inter-item correlations, factor determinacy, factor loadings, or communalities for items related
to informal student interactions. According to Bollen (1989) and Brown (2006), latent factors used in confirmatory factor analysis (CFA) and structural equation models (SEMs) represent the underlying construct that accounts for the intercorrelations among different items, and factor loadings can be viewed as validity coefficients.

2.1.1 College Racial Composition

As stated, a major limitation of studies regarding IID is that most researchers overuse race-comparative studies to test the effects of IID and similar constructs across separate racial groups (Strayhorn, 2010). If a significant amount of variability is present within a specific racial group, then testing average, between-group differences and evaluating the effects of measures pooled across Blacks and other racial groups is likely to provide substantively meaningless results. As mentioned, a beneficial alternative to using race-comparative studies is to utilize a within-group design (McLoyd & Steinberg, 1998). At the same time, even when using a within-group design to test the influence of IID among Black college students’ educational outcomes and diversity beliefs, college racial composition may have a significant effect on the internal validity of a within-group design. According to McLoyd and Steinberg (1998), studies involving group comparisons require that the groups be equated on all relevant background variables, whereby observed differences on dependent variables can be reliably attributed to the factors and independent variables under study. Black HBCU students generally have fewer interactions with other racial groups and report different motivations for entering college, in addition to divergent college expectations and experiences compared to their counterparts at TWIs (Allen, 1992; Freeman & Thomas, 2002). Hence, utilizing a within-group design that assumes ME/I exists by examining the effects of IID across Black
HBCU/TWI students may provide results that are no better than that of race-comparative studies.

When attempting to assess the impact of college racial composition on Black college students’ academic outcomes and diversity-related beliefs, researchers identified a number of advantages and disadvantages of attending both HBCUs and TWIs (Allen, 1992; Allen & Jewell, 2002; Allen & Solórzano, 2001; Freeman & Thomas, 2002; Greer, 2008; Greer & Chwalisz, 2007; Strayhorn, 2008; Upton et al., 2012). Blacks at TWIs, in particular, are likely to report experiences of racial discrimination and social exclusion from their White peers, and benefit academically when there are counterspaces or a critical mass of Black students on campus with whom they can interact and form their own social networks (Allen, 1992; Allen & Solórzano, 2001; Harper & Hurtado, 2007; McCabe, 2009; Solórzano et al., 2000). Compared to students at HBCUs, Black TWI students also have increased IID or interactions with individuals from diverse racial backgrounds, tend to go to schools with better academic reputations and funding, and graduate with higher average earnings (Allen & Jewell, 2002; Freeman & Thomas, 2002). HBCUs represent approximately 3% of the institutions of higher education, and despite the fact that HBCUs receive less funding than TWIs they are responsible for nearly 22% of the bachelor’s degrees awarded to all Blacks in the U.S. (Fryer & Greenstone, 2007).

Compared to Black TWI students, Blacks at HBCUs report fewer incidents of racial discrimination and social anomie, have improved relationships with faculty and staff, and exhibit increased psychosocial adjustment (Allen, 1992; Allen & Solórzano, 2001; Freeman & Thomas, 2002). Given the differences in HBCU and TWI students’
college experiences and levels of IID, it is likely that measurement non-invariance (measurement bias) exists, such that IID is conceptually dissimilar for Black HBCU and TWI students and that Black TWI students may be more inclined to endorse items pertaining to IID. Many studies have used racially diverse college samples to investigate the influence of IID on student engagement and other learning and democratic outcomes (Antonio, 2001; Hu & Kuh, 2003; Shaw, 2005), though no studies have examined within-group heterogeneity in terms of whether IID operates equivalently across Black HBCU and TWI students.

2.2 Proposed Research Questions and Hypotheses

Most research on racial diversity utilizes samples that are mainly comprised of White college students, while implicitly assuming that ME/I exists for IID and other, related measures among Black HBCU and TWI students. More research is needed to generate a more valid, standardized measure of IID for Blacks and other racial groups. Further studies are also needed to test the factor structure, reliability, and validity of IID, and to test for ME/I among subsets of Black college students. Therefore, this study seeks to generate inclusion rules regarding the items to retain (or exclude) when examining IID and similar scales among Black HBCU and TWI students, to evaluate the reliability and factor structure of IID, and to improve the generalizability of this particular measure. In this study, I also use a volunteer sample and a core sample of Black college students entering their first year of law school, along with six ordered-categorical IID items derived from prior studies to address the following questions:

1. What is the factor structure of IID among Black college students when examining the volunteer sample?
• **Hypothesis 1**: Results from analyses performed using a subset of Blacks drawn from a volunteer sample of college students entering law school will indicate that the factor structure for the six IID items would be unidimensional, and that factor loadings will be positive.

2. Does a subset of 589 Black college students entering their first year of law school drawn from a nationally representative core dataset replicate findings from the volunteer sample with respect to the unidimensional factor structure of the proposed IID scale?

• **Hypothesis 2**: Statistical results drawn from Blacks in the core dataset will replicate the unidimensional factor structure derived from the volunteer sample.

3. Using the subsample of Blacks drawn from the core sample, do tests of ME/I indicate that the proposed measure of IID operates equivalently across Black HBCU and TWI students, or does differential item functioning exist for one or more IID items?

• **Hypothesis 3**: Partial ME/I will exist, such that the difficulties or thresholds for one or more of the items under study will be lower for Blacks TWI students compared to their counterparts at HBCUs. This final hypothesis is based on the fact that relative to Black HBCU students, Blacks at TWIs generally come into greater contact with other racial or ethnic groups and will most likely display less item difficulty (i.e., Black TWI students will have lower thresholds).

2.3 **Sample and Participants**

Data were drawn from a volunteer sample and from the Educational Diversity Project (EDP; Daye, Panter, Allen, & Wightman, in press), which is a national,
longitudinal, and multi-method research study of law school students. Participants in the volunteer sample included 1,963 college students entering their first year of law school, where a subset of 143 Black students is drawn from the volunteer sample. More specifically, the volunteer sample was comprised of 126 self-identified African Americans, seven self-identified Haitians, 35 self-identified Caribbean students, and seven self-identified Africans, who make up approximately 7.3% of the total volunteer sample. The average LSAT score for volunteer participants was 152 ($SD = 4.68$) and the mean age was 26.52 ($SD = 5.81$). Participants in the volunteer sample came from 16 American Bar Association (ABA) approved, accredited law schools, originating from 442 undergraduate institutions. Administrators of the 16 law schools in this sample volunteered to be a part of the EDP after learning about the study through a presentation at an annual Law School Admissions Council (LSAC) meeting, or after reading about the study from a newsletter widely distributed to admissions counselors. The schools in the volunteer sample did not comprise the random sample used for the EDP study. Schools in the volunteer sample were also not a probability sample of law schools in the U.S., but they represented 12 states spanning the continental United States.

Schools in the EDP core sample consisted of 6,100 college students entering their first year of law school from 50 ABA approved U.S. law schools. For this particular study, I used a subsample of the EDP core dataset comprised of 589 Black students. Schools in the EDP core sample were drawn using two methods. First, EDP investigators oversampled seven law schools identified as having high minority populations and randomly drew an additional 46 schools from the remaining 177 ABA approved law schools. Of these schools, one was ineligible to participate and two were nonresponsive,
resulting in a final sample of 50 law schools. Data were collected in 2004 by a collaborative team of researchers from three universities as part of the EDP study. Institutional characteristics of incoming law school students’ undergraduate institutions were obtained from the Integrated Postsecondary Education Data System (IPEDS) from the fall of 2004. Law school information and characteristics were obtained from ABA data sources on law schools. In addition to the 2004 survey, focus groups were conducted with approximately 200 students at 11 law schools in the spring of 2005, 2006, and 2007. Moreover, in the spring of 2007, a follow-up web survey was administered to a subsample of law students who completed the baseline survey.

The EDP core sample consisted of 4,079 Whites who made up approximately 66.9% of the total sample. Blacks made up the second largest racial group, and comprised 589 participants or 9.7% of the EDP sample. Asians were the third largest racial minority group (n = 508 or 8.3% of the total sample). The next largest racial group was comprised of 343 multiracial White participants (5.6% of the sample), followed by 184 Hispanic/Latino participants (3.0% of the sample), 150 multiracial participants of Color (2.5% of the total sample), and 143 Mexican participants (2.3% of the sample). Moreover, the average LSAT score for the Black EDP participants was 148.64, which is slightly below the national LSAT average score of 150. The mean age for participants was 25.44 (SD = 5.12).

2.4 Procedure

After obtaining approval from each participating school’s dean and the Institutional Review Board, the EDP research team worked with a designated contact person at each school site to arrange survey administration procedures. The EDP survey
was administered during the first-year student orientation period within the first weeks of law school. In most cases, students completed the survey in a group setting during first-year orientation activities. At about one-third of the schools, students took the survey home to complete and returned it to a central location. We conducted a short interview with survey administrators at each school to document and code additional unique features about data administration. Only surveys with a signed consent form were included in the final database (approximately 96% of those returned).

2.5 Measures

*Informal interactional diversity (IID)* was analyzed using six items. The six IID items used were derived from studies conducted by Gurin et al. (2002), Gottfredson et al. (2008), Chang et al. (2006), and Antonio (2001). Five of the six items measured whether students have close friends, discuss racial issues, attend racial/cultural awareness programs, date, and study with someone from a different racial/ethnic group during students’ time as undergraduates. The sixth item examined whether incoming law students have serious conversations with individuals who are very different in terms of religious beliefs, political opinions, or personal values during their last year of college. Furthermore, while the sixth item appeared to be somewhat unrelated to the other IID items, this particular item was examined because it was very similar to items used by Strayhorn (2010) and Chang (1999) to create IID or other, similar scales.

*College Racial Composition* was assessed by dividing Blacks in the EDP Core study into two separate groups: those who previously attended a TWI and those who previously attended a HBCU. When performing analyses to test for ME/I, racial composition was defined such that Black college students who matriculated into law
school from HBCUs were treated as the focal group (66%; \( n = 389 \)), and those who previously attended TWIs (34%; \( n = 195 \)) were treated as the reference group.

2.6 Data Analyses

2.6.1 Multilevel Factor Models

Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) are based on the common factor model (Brown, 2006), which assumes that a model is properly specified (i.e., the hypothesized model corresponds directly to the model that exists in the population), the expected value of the residuals or unique factors is zero, unique factors are uncorrelated with common factors, and unique factors are normally distributed and uncorrelated with one another (Flora & Curran, 2004). The general linear model and common factor model also assume that observed or manifest indicators are continuous and conditionally normally distributed, a linear relationship exists between the indicators and latent variables, and that individual observations are independent such that residuals are not related across observations (Flora & Curran, 2004; Wirth & Edwards, 2007). Because the EDP study is comprised of hierarchically structured data that violate the assumption of independent residuals, a multilevel modeling framework is needed to provide accurate standard errors and significance tests while accounting for the nesting of students within schools (Raudenbush & Bryk, 2002).

More specifically, the EDP data are hierarchically structured because there are students nested within law schools, whereby students who attend the same law school are likely to provide similar or non-independent responses compared to students who attend different law schools. The result of non-independence or nesting is that it generally causes the standard errors of estimates derived in regression and factor models to be
downwardly biased, which subsequently increases the risk of committing Type I errors. Thus, in order to correct the bias stemming from nesting and correlated or non-independent student responses, it is important to use multilevel modeling or fixed effects models that correct the standard errors of parameter estimates. Given that I also seek to investigate the factor structure of the proposed measure of IID among Black college students entering their first year of law school while correcting for measurement error, the use of a latent variable modeling framework is also necessitated (Bollen, 1989). Therefore, in this study I used exploratory factor analysis (EFA) to assess the factor structure of IID, along with multilevel factor models to account for nesting on the six items designed to measure IID (Mehta & Neale, 2005).

As stated, multilevel factor models are advantageous when dealing with hierarchically structured data that violate the assumption that residuals from different observations are independent. The use of aggregated analyses that fail to account for non-independence can lead researchers to falsely conclude that a set of items do not adequately measure a latent construct because of bias in the standard errors and parameter estimates (Dyer, Hanges, & Hall, 2005; Muthén, 1994). Ignoring nesting effects or non-independence in aggregated factor models can also cause overall model fit and the factor loading estimates to be biased, and confounding may occur because a separate factor structure is operating at the between- (school-level) and the within-group (student-level) level (Dyer et al., 2005; Muthén, 1994). Additionally, analyses that do not account for hierarchically structured data or nesting may cause researchers to draw misleading conclusions, because items might appear to be correlated, even after removing the influence of a single latent variable. This, in turn, could lead researchers to incorrectly
conclude that a unidimensional scale is comprised of two or more latent factors (Dyer et al., 2005). Single-level or aggregated analyses that do not analyze factor structures at the within- and between-group levels are less computationally intensive than multilevel factor models and can provide useful information regarding the viability of measurement models that can be analyzed in subsequent, more complex multilevel factor models. However, when utilizing factor models that fail to account for nested data structures, it impossible to deduce whether the factor structure of IID is different at each data level, or if the factor structures of IID at the within- (student-level) and between-group levels (school-level) are equivalent.

Goldstein and McDonald (1988) and McDonald and Goldstein (1989) were among the first to develop multilevel factor models and multilevel SEMs (MSEM), where a common factor model is estimated at the within- (level-1) and the between (level-2) group level. Based on these researchers’ initial approach to incorporate a true full information likelihood maximum likelihood estimator for multilevel SEM models, the common factor model at each data level (the within- and between-group level) is written as follows:

\[
\sum_B = \Lambda_B \Phi_B \Lambda_B' + \Theta_B
\]

\[
\sum_W = \Lambda_W \Phi_W \Lambda_W' + \Theta_W
\]

(1)

In Equation 1, the subscript “B” represents matrices at the between-group (level-2) or school-level and the subscript “W” represents matrices at the within-group (level-1) or student-level (Gottfredson et al., 2009). For the purposes of this study the symbol \( \Sigma \) represents the model-implied population covariance matrix at the individual and at the school level. The symbol \( \Lambda \) represents the factor loading matrix at each level, and the
symbol $\Phi$ depicts the correlation matrix for correlations among latent variables. Finally, the symbol $\theta$ represents the residual matrix at both the within- (student-) and the between-group level (school-level). In a multilevel factor model, these equations can be combined to generate the “between and within” measurement model or the total covariance structure of the measurement model at both the student- and the school-level (Gottfredson et al., 2009):

$$\sum_{i} = \Lambda_{w} \Phi_{B} \Lambda_{B} + \Lambda_{w} \Phi_{w} \Lambda_{w} + \theta_{w} + \theta_{B}$$

(2)

2.6.2 Examining Categorical Indicators

In addition to dealing with a hierarchical data structure with respect to students nested within law school institutions, the manifest indicators or items used to represent IID are rated using a Likert-type ordinal response scale. While it is possible to disregard several assumptions underlying the common factor model and to treat these items as continuous, past research has shown that ignoring the categorical nature of manifest indicators can lead to a number of undesirable outcomes. Indeed, Brown (2006) argued that some of the potential drawbacks of treating categorical items as continuous in latent variable models include attenuating correlations among manifest indicators, obtaining “pseudofactors” or spurious latent factors that emerge as artifacts of item thresholds, and producing incorrect parameter estimates and standard errors. Treating the indicators representing IID as continuous could also generate a potential mismatch between the assumptions underlying common factor models and the empirical characteristics of the data, which can undermine the validity of parameter estimates (Flora & Curran, 2004).

Instead of evaluating factor models where ordinal response scales are treated as continuous, a more ideal approach is to utilize nonlinear factor analysis or item factor
analysis (IFA) models with ordered categories. Wirth and Edwards (2007), in particular, provided a detailed description of categorical confirmatory factor analysis (CCFA) and other variants of the general item factor analytic (IFA) framework. CCFA models assume that ordinal or ordered-categorical items responses are discrete representations of an underlying, continuous latent response. They posited that the proportion of individuals who endorse each categorical response option provide information about the latent response distribution through threshold parameters (item difficulties). More specifically, in a dichotomous item rated as agree or disagree, threshold parameters demarcate the point on the continuous latent response scale that separates one observed discrete response from another, and delineates whether an individual chooses the option to agree versus disagree.

Based on the CCFA framework (see Wirth & Edwards, 2007) and the statistical notation used by Kim and colleagues (Kim, Kwok, & Yoon, 2012) depicting multilevel measurement models, the data model for the underlying true score of a given item depicting IID is:

\[ y_{ij}^* = \nu + \Lambda_B \eta_{Bj} + \Lambda_W \eta_{Wj} + \epsilon_{Bj} + \epsilon_{Wij} \]  

(3)

In Equation 3, \( y_{ij}^* \) represents the latent score for an ordered categorical IID item for an individual (i) within a cluster or school, denoted (j). The symbol \( \nu \) is used to denote the randomly distributed school mean or the intercept of an observed variable (i.e., the random intercept) defined at the cluster level (between-level) only. The symbols \( \eta_{Bj} \) and \( \eta_{Wj} \) depict random factors at the between-level (school-level) \( B \) and at the within-level (the student-level) \( W \) with an expected value of zero for the cluster effects and the
individual effects, respectively (Kim et al., 2012; Muthén, 1994). The values $\Lambda_B$ and $\Lambda_W$ denote vectors of factor loadings at the between- ($B$) and within-levels ($W$), and the symbol $\epsilon_{Bj}$ depicts the vector for the unique factor or residual at the between-level.

Finally, the symbol denoted $\epsilon_{wij}$ denotes the vector for the item residual term, which for a linear predictor $y_{ij}^*$ that is linked to the actual response ($y_{ij}$) using the logit link with an assumed logistic error distribution, the variance of this term is fixed at $\frac{\pi^2}{3}$ (Gottfredson et al., 2009).

One method that is used to estimate CCFA model parameters for ordered-categorical indicators is robust weighted least squares estimation, diagonally weighted least squares, or what is also known as a mean and variance-adjusted weighted least squares estimation (WLSMV; Muthén et al., 1997). Robust weighted least squares was created to address problems with estimating models for non-normal continuous and ordered categorical data using full weighted least squares (WLS) estimation (Flora & Curran, 2004). WLSMV operates through the use of a weight matrix that only includes diagonal elements, and is generated through the analysis of polychoric or tetrachoric correlation matrices (Wirth & Edwards, 2007). Compared to maximum likelihood estimation that uses a logit link function, the probit link function is utilized in CCFA models based on WLSMV estimation, where the variance of the error distribution is fixed at 1. WLSMV estimation is useful in that it generally provides accurate estimates, even when working with sample sizes of at least 250 (Flora & Curran, 2004; Hoyle, 2012). WLSMV requires low computational time when examining complex models. WLSMV also provides a two-stage estimation procedure where a saturated model is estimated for
multilevel data, which allows for the assessment of global fit indices that are not available when using maximum likelihood estimation. Despite its usefulness, WLSMV estimation has several limitations. WLSMV works under the assumption that data are missing completely at random (MCAR) or that the probability of missingness on the dependent variables is unrelated to any of the values of the variables included in a dataset (Brown, 2006). In the event that data are missing at random (MAR) or that the probability of missingness is related to observed variables in the dataset (Brown, 2006), WLSMV will not provide accurate point estimates.

Compared to WLSMV estimation, a second, more efficient method that uses raw data instead of polychoric (or tetrachoric) correlations to estimate models with nested and non-normal data is robust maximum likelihood (MLR) estimation. MLR estimation is a full information maximum likelihood estimator that is asymptotically equivalent to the estimator derived by Yuan and Bentler (2000). In addition to the assumptions underlying the common factor model, maximum likelihood estimation has several important requirements that must be met to ensure that parameter estimates and standard errors are consistent, asymptotically unbiased, and efficient (Bollen, 1989). According to Bollen (1989), a consistent estimator is defined as one for which the probability of obtaining an accurate estimate that is close to the true population parameter increases as the sample size approaches infinity. An asymptotically unbiased estimator is defined as an estimator whose bias decreases as the sample size becomes large (approaches infinity). An estimator is said to be efficient in the event that no other unbiased estimator of the sample parameter has a sampling distribution with smaller variance, or that the standard errors of parameter estimates are as small as possible (Bollen, 1989). Hence, when using
maximum likelihood estimation that accounts for nesting and non-normality (MLR estimation), consistent, efficient, and asymptotically unbiased parameter estimates are obtained when the assumptions of multivariate normality holds (or the estimation method correctly adjusts for excess kurtosis and non-normality), data are missing at random (MAR), there is a sufficiently large sample size, and correct model specification (Bollen, 1989; Kaplan, 2009).

2.6.3. Testing Alternative Multilevel Factor Models

Following the initial development of multilevel SEMs by Goldstein and McDonald (1988), Muthén (1989, 1994) developed a pseudo-maximum likelihood estimator that allowed researchers to generate random intercept models with unbalanced data. However, the estimator created by Muthén could not handle missing data or categorical outcomes (Gottfredson et al., 2009), and the ability to assess multilevel SEMs with categorical indicators was only recently developed in Mplus Version 3 (2004). In the development of MSEM, researchers have argued that the total covariance structure of a multilevel factor model (between and within measurement model) can be simplified if the factor loading matrices at the within- and between-group level are constrained to equality. In this case, the latent construct under examination (IID) is interpreted as a single factor with its variance divided at the student- (within-group level or level-1) and the school- (between-group level or level-2) level (Gottfredson et al., 2009; Mehta & Neale, 2005; Rabe-Hesketh, Skrondal, & Pickles, 2004; Skrondal & Rabe-Hesketh, 2004). According to Mehta and Neale (2005), invariance or equality among factor loadings at the within- and between-group level causes the scales of latent common factors across separate levels to be equivalent.
When analyzing variance components measurement models (Mehta & Neale, 2005; Rabe-Hesketh, Skrondal, & Pickles, 2004), the model previously described can be further simplified to provide a more parsimonious solution, whereby $\theta_b$, the residual matrix at the between-level (school-level) is fixed to zero. In other words, if it is assumed that the variability of manifest indicators is driven by between-cluster variability in one or more underlying latent factors, then the residual variances or cluster means of indicators at level-2 (school-level or the between-level) can be viewed as representing only measurement error. In many cases the level-2 residual variances in multilevel factor and multilevel SEM models tend to be small or statistically non-significant. Thus, for parsimony researchers often fix the residual variances at the school-level (level-2) to zero, which substantively implies that at the school level (level-2), the variance of an item only stems from a common factor (IID) and not from any additional sources of variance (i.e., measurement error) that are consistent for students nested within a particular school (Gottfredson et al., 2009).

Taken together, the variance components measurement model works under the assumption that between-level variance is derived from an underlying common latent factor, the common factor loading structure is equivalent at the within- (student-) and the between-group level (school-level). This particular models also assumes that there is no specific between-level variance in an indicator that does not stem from the common underlying common factor(s) (Gottfredson et al., 2009; Rabe-Hesketh, Skrondal, & Pickles, 2004; Skrondal & Rabe-Hesketh, 2004). Hence if model fit indices indicate that the student- and school- level factor loadings are equivalent and that fixing the level-2 residual covariance matrix to zero provide a better data fit, then the between and within
measurement model (see Equation 1) simplifies to the variance components measurement model (Gottfredson et al., 2009; Rabe-Hesketh et al., 2004; Skrondal & Rabe-Hesketh, 2004):

\[
\sum_B = \Lambda_B \Phi_B \Lambda_B^T
\]
\[
\sum_W = \Lambda_W \Phi_W \Lambda_W^T + \theta_W
\]
\[
\sum_r = \Lambda_W \Phi_W \Lambda_W^T + \Lambda_B \Phi_B \Lambda_B^T + \theta_W
\]

Equation 4 (the variance components measurement model) is analogous to Equation 1 (the between and within measurement model), except that the residual matrix at the between-level is now fixed to zero and is subsequently dropped from the model. The benefits of examining the variance components measurement model are that this particular model is more parsimonious than the between and within measurement model, and the variance components formulation is easier to interpret (this model treats IID as a single latent factor at level-1 and level-2) when examining latent constructs such as IID.

2.7 Analysis Plan

When investigating the first research question, I used the volunteer sample to perform EFA that accounted for the categorical nature of the IID items and assessed whether a unidimensional factor structure existed for the proposed IID scale. Multilevel factor analyses were not performed when using the volunteer sample, because the volunteer sample provides information on 143 Black college students entering approximately 16 law schools. The number of parameters estimated when testing whether the factor structure for IID at the between-level consists of one, two or even three factors would require at least 21 parameters (Brown, 2006). According to Muthén and Muthén (1998-2007), to obtain reliable results, the number of parameters estimated at the
between-level in a multilevel factor analysis (at least 21 parameters in this case) should not exceed the number of clusters (16 law school institutions). Given the small number of clusters and overall sample size provided by the volunteer sample, multilevel factor analysis was not deemed appropriate when attempting to assess whether the factor structure of IID differs at the student- and school-level. Furthermore, Fabrigar, Wegener, MacCallum, and Strahan (1999) reported that a sample size as small as 100 can provide accurate estimates of population parameters when utilizing single-level EFA, provided that the factor(s) examined are over-determined (the factors consist of at least three or more items) and the item communalities are high (i.e., the average item communality is .70 or higher).

To examine the second research question and replicate findings from the volunteer sample, I utilized a subsample of the EDP core data comprised of 589 Black college students entering law school from 50 ABA-approved U.S. law schools. Analyses used to examine the second question included multilevel confirmatory factor analysis (CFA) models (see Equation 2) with sampling weights to account for students nested within law school institutions and for unequal probabilities in selection based on the multistage random sampling strategy employed in the EDP study. However, given the fact that the IID items pertain to students’ diversity experiences during their undergraduate years, it is plausible that non-independence could also stem from students nested within undergraduate institutions. Thus I tested preliminary CFA and multilevel CFA models that accounted for students nested within undergraduate institutions, and I examined separate, analogous models that accounted for the nesting of students within law schools. Overall results from both sets of models (models that adjusted for students
nested within undergraduate institutions and separate models that accounted for students nesting within law schools) remained the same, and so the final models reported only account for nesting within law schools. Another option was to utilize a cross-classified random effects model to account for the fact that the nesting structure in the EDP data is not strictly hierarchical, and that a significant amount of variability in student responses could be attributed to the fact that students from the same undergraduate institutions could have moved on to attend the same law schools (Raudenbush & Bryk, 2002). Yet based on preliminary tests performed in SAS, most of the cross-classified models did not converge, nor did these models indicate that there was a strong correlation among students who attended the same undergraduate and law school institutions.

Thus, the final models examined utilized multilevel factor models with categorical indicators (Gottfredson et al., 2009; Rabe-Hesketh et al., 2004; Skrondal & Rabe-Hesketh, 2004) to account for the nesting of students in law schools. More specifically, my data analytic strategy was to first examine the factor structure of IID based on results from a single-level CFA model that utilized a sandwich estimator to adjust standard errors to account for students nested within law schools. The reason why a single-level CFA (aggregated analysis) was initially tested is because it is less computationally intensive than multilevel factor models, and it allows researchers to examine whether the hypothesized, unidimensional factor structure of IID fits well in the population of Black college students entering law school.

Based on results from the aggregated analysis, I then evaluated multilevel factor models using the between and within measurement model or the model represented in Equation 2 that accounted for students nested within law school institutions. Next, after
constraining the factor loading matrices at the student- and school-level to equality and fixing the residual matrix at the school-level to zero, I assessed the more parsimonious variance components measurement model. When performing likelihood ratio tests with multilevel models, an important regularity condition or requirement is that for the likelihood ratio to obtain a chi-square distribution, none of the parameters in a model are fixed to a boundary value to produce a more restricted model. By definition, residual variances cannot take on negative values, and so the boundary value of any residual variance estimated is zero. Examining the variance components measurement model by fixing the level-2 residual variances for the IID items to zero sets the residual variances to a boundary value and violates regularity conditions for a likelihood ratio test. Thus, instead of using a likelihood ratio test (a chi-square difference test) to compare the fit of the between and within measurement model to the variance components model, the Akaike information criterion (AIC) and the Bayesian information criterion (BIC) were used to compare the two models.

Moreover, in the event that any items exhibited low item communalities or if modification indices indicated that local dependence (correlated errors) exist between any of the indicators, then one or more items were dropped from the IID scale. The reason for deleting items with low item communalities and correlated errors stems from the fact that a low item communality suggests that a latent factor accounts for little variance in an item, whereas local dependence is indicative of an inefficient measure with redundant items (Brown, 2006). Based on results from the volunteer and EDP core subsamples, SAS 9.2 software was used to estimate alpha coefficients (Cronbach’s alpha) and item-total correlations for the proposed IID scale. Item-total correlations provide information
with respect to the degree of how highly correlated each item is with the overall IID scale and item-total correlations aid in assessing the reliability of a measure.

For the third research question, multiple group multilevel CFA models are analyzed using the EDP core data to evaluate whether ME/I holds for the proposed measure of IID across Black HBCU and TWI students. Based on recommendations provided by Vandenberg and Lance (2000) and Millsap and Yun-Tein (2004), ME/I can be established across Black HBCU and TWI students when a multiple group or multi-sample model suggests that the same factor model fits reasonably well across the two or more groups (configural invariance), tests reveal that factor loadings are equivalent (metric invariance), and tests indicate that the item thresholds or difficulties are equivalent for Black HBCU and TWI students (similar to scalar invariance or the invariance of item factor loadings and intercepts). The current version of Mplus does not allow for multiple group analyses for multilevel models with categorical data. A viable alternative to multiple group multilevel CFA models for ordered categorical indicators can be obtained by using finite mixture models with two known, observed groups representing Black HBCU and TWI students.

As stated, WLSMV has several benefits over MLR estimation because it requires less computational time and provides global and comparative fit indices. Yet compared to WLSMV estimation, MLR estimation is advantageous because it provides more efficient estimates and does not assume that data are MCAR. Hence, results including unstandardized factor loadings, standard errors, factor determinacy, and item communalities taken from the EFA model based on the volunteer sample and analyses derived from the EDP core sample are reported using MLR estimation. Fit indices such
as chi-square, the root mean-square error of approximation (RMSEA), the comparative fit index (CFI), and the Tucker Lewis index (TLI) are reported based on models estimated using WLSMV estimation.

RESULTS

Question 1

The first study hypothesis was utilized to uncover the factor structure of IID based on the EDP volunteer sample, and to use a within-group design to assess whether a unidimensional factor structure holds for IID among Black college students. Preliminary results based on zero-order correlations and item frequencies indicated that each of the six items were positively and significantly correlated (using an alpha level of .05), except for the items representing the frequency with which students report that they discuss racial issues or attend racial/cultural awareness programs. Results showed that these two items (discuss racial issues and attend racial/cultural awareness programs) were not significantly correlated with several of the other IID variables. Correlations, the median and standard deviation of each IID item based on the volunteer sample are displayed in Table 2.1. For the EDP core sample correlations, the median and standard deviation of the IID items are shown in Table 2.2. Demographic characteristics and reports of IID for Black students drawn from the volunteer and EDP core samples are also shown in Table 2.3. Moreover, demographic characteristics and reports of IID for Black students from the EDP core samples compared to Whites, Asians, and Hispanic/Latino students drawn from the EDP core sample are displayed in Table 2.4.

As stated, initial results from correlation tables revealed that when examining the volunteer data, two of the six IID items were not significantly correlated with many of the
other items using an alpha level of .05 (see Table 2.1). Findings from the first maximum likelihood (ML) EFA (using MLR estimation) revealed a factor loading of .09 for the item representing the frequency with which Black college students entering law school discussed racial issues. Results from this model also revealed another low factor loading estimated (EFA results showed a factor loading of .11) for the item representing the frequency that Black students attended racial or cultural awareness programs. Results based on an analogous EFA using WLSMV estimation indicated extremely poor model fit: $\chi^2(6, N = 143) = 143.32, p < .05; \text{CFI} = .73; \text{TLI} = .65; \text{RMSEA} = .40$. Overall, non-significant zero-order correlations and findings from the initial EFA did not support the hypotheses that the factor structure for the six IID items was unidimensional.

Given the statistically non-significant correlations (for the items relating to whether students discussed racial issues or attended racial/cultural awareness programs), low factor loadings and poor model fit in the initial EFA model, I examined an additional ML EFA after removing the items pertaining to the frequency that students discuss racial issues or attend cultural awareness programs. Using MLR estimation, the factor loadings for this particular model ranged from .34 to .94 with an average item communality of .55. The factor determinacy (based on the model generated using MLR estimation) was .96, indicating a high correlation between the factor scores or the estimated scores and the true scores and providing a positive indication of how well the factor scores were estimated. The overall model fit based on results from WLSMV estimation additionally showed improvement: $\chi^2(2, N = 143) = .01, p > .05; \text{CFI} = 1.00; \text{TLI} = 1.00; \text{RMSEA} = .00$. Nevertheless, given the low average item communality of .55 and recommendations provided by Fabrigar et al. (1999), a sample size of 200 or more was probably needed to
obtain more accurate estimates of population parameters. Albeit, these findings were based on a volunteer sample, which, irrespective of sample size, does not offer results that were generalizable to all Black undergraduates. Results from the volunteer sample, including item factor loadings, estimated standard errors, and item communalities for the final ML EFA model with four items are displayed in Table 2.5.

Using SAS 9.2 and the observed IID items used in the final EFA model, the alpha coefficient for the selected EFA was .74. Based on factor scores generated in Mplus the item-total correlations for the proposed IID scale based on the remaining four items are shown in Table 2.6. In addition, a pictorial display of the scree plot used in the final EFA model (using WLSMV estimation) is shown in Figure 2.1.

**Question 2**

The second study hypothesis addressed whether a subset of 589 Black college students entering their first year of law school drawn from the EDP core sample replicated findings from the ML EFA using the volunteer sample. Based on my data analytic strategy, I first examined an aggregated, single-level CFA that used sampling weights and sandwich estimation to determine the viability of measurement models estimated using more complex, multilevel factor models. Initial results from the single-level CFAs using MLR and WLSMV estimation suggested that the unidimensional factor structure of the model did not hold, and the model failed to converge as a result of poor model fit (the RMSEA fell above .08 and the CFI and TLI were below .90). However, given the statistically non-significant correlations for the “discuss racial issues” and the “attend racial/cultural awareness programs” items with several of the other IID items (see Table 2.3) in both the volunteer and the EDP core data, the lack of convergence for the
aggregated CFA models was relatively unsurprising. Analogous to the analyses performed with the volunteer data, I generated an additional set of aggregated CFA models with MLR and WLSMV estimation after removing the “discuss racial issues” and “attend racial/cultural awareness programs” items. Results indicated that a unidimensional factor structure held for the four remaining IID items:

\[ \chi^2(1, N = 588) = 2.21, p > .05; \text{CFI=.99; TLI=.99; RMSEA=.05.} \]

I obtained similar findings based on a single-level CFA using MLR estimation, which revealed positive, statistically significant factor loadings (standardized factor loadings ranged from .36 to .93). Findings from the aggregated, single-level CFA model using MLR estimation, including unstandardized factor loadings, standard errors, and item thresholds are displayed in Table 2.7. In addition, Figure 2.2 depicts a path diagram of the final aggregated, single-level CFA model.

Next, I used the remaining four IID items to examine the between and within model (see Equations 1 and 2), where a unidimensional factor structure was examined at the student- (level-1) and the school-level (level-2). Model fit using WLSMV estimation appeared to be good, but this model did not converge properly due to a negative residual variance or a Heywood case (Brown, 2006). Results based on MLR estimation showed that the variance of the IID factor at level-2, the level-2 factor loadings, and the level-2 residual variances were statistically non-significant using an alpha level of .05, and this model also displayed a negative residual variance for one of the IID items. The AIC for the between and within model utilizing MLR estimation was 6,063.51, the BIC was 6,159.79, and the sample-size adjusted BIC was 6,089.95. What is more, Figure 2.3 provides a pictorial display of the between and within model.
The final step in examining multilevel factor models was to examine the variance components measurement model (and compare it to the between and within measurement model), using WLSMV estimation. The variance components measurement model displayed excellent model fit: \( \chi^2(3, N = 588) = 1.28, p > .05; \text{CFI}=1.00; \text{TLI}=1.00; \text{RMSEA} < .01 \). Results for the variance components measurement model via MLR estimation showed that the variance of the IID factor at the student-level (level-1) was positive and statistically significant, whereas the factor variance at the school-level was not significant when using an alpha level of .05. The AIC, BIC and sample-size adjusted BIC for the variance component model based on MLR estimation were 6,066.17, 6,149.33, and 6,089.01, respectively. Because the BIC for the variance components measurement model exhibited a slight improvement in fit and the between-level residual variances for the between and within measurement model were statistically non-significant (and displayed a Heywood case), the preferred model selected was the variance components measurement model.\(^1\)

Results for the selected variance component model (using MLR estimation), including unstandardized factor loadings, standard errors, and communalities is displayed in Table 2.8. A path diagram of the variance components measurement model is shown in Figure 2.4. Using the variance components model generated via MLR estimation, the ICC of the underlying common factor representing IID was .11, and by definition, this

\(^1\)Because the level-2 factor variance, factor loadings, and residual variances estimated in the multilevel factor models tested are statistically non-significant, it could be argued that the use of multilevel factor analyses is not necessitated and that single-level, aggregated CFAs are best suited for the data. Based on this, I also examined single-level multiple group CFA models to evaluate whether ME/I holds across Black HBCU and TWI students. Results from single-level analyses similarly show the same unidimensional factor structure holds, and that ME/I requirements are met across HBCUs and TWIs.
value represents the proportion of variance in the latent IID factor that resides at the school level (Gottfredson et al., 2009). The ICC for a latent factor depicting IID is calculated by dividing the estimated between-level latent factor variance by the total latent factor variance (the between-level factor variance in addition to the within-level latent factor variance) (ICC; Muthén, 1994). Based on results for the variance components measurement model (using WLSMV estimation), the estimated ICCs for each of the IID items were also estimated. Similar to the ICC for a latent factor, the intra-class correlation (ICC) for each item represents the amount of variance in the item due to differences between schools. The ICC for each study item also represents the degree of dependence in the data or the correlation between Black students who attend the same law school institution (Raudenbush & Bryk, 2002), where ICCs for the four IID items ranged from .01 to .13.

**Question 3**

The third research hypothesis addressed whether ME/I holds for IID across Black HBCU and TWI students. As a first step in assessing ME/I, I used a multiple group multilevel CFA to develop a baseline model to test whether configural invariance (Brown, 2006; Vandenberg & Lance, 2000) exists across the two groups. When attempting to examine configural invariance, multilevel CFA models for Black HBCU and TWI students were combined using a multiple group multilevel CFA model with ordered categorical indicators. This model was estimated using a one-class finite mixture model with a single, known group represented by students who previously attended a HBCU or a TWI. Additionally, I tested for configural invariance by freely estimating all of the factor loadings at the within- (level-1) level across the two groups (HBCUs and
TWIs) after fixing the factor loading for the item pertaining to the frequency with which students studied with individuals from different racial groups to one. The purpose of fixing the factor loading of this particular item to one was to set the scale of the latent factors at level-1 and level-2. In this baseline or configural invariance model, most thresholds at the between-level (level-2) across the two groups were also freely estimated. In this model, the factor mean for HBCUs were freely estimated ($M = .29$, $SE = .70$), while the factor mean for TWIs was fixed at zero. I then constrained a subset of the thresholds estimated across HBCUs and TWIs to equality for the model to be identified. The particular set of thresholds that were constrained to equality were selected after I tested preliminary, single-level CFA models and used chi-square difference tests and results from modification indices to assess which set of thresholds initially appeared to invariant across HBCUs/TWIs.

Next, I estimated a second, metric invariance model where the level-1 factor loadings were constrained to equality across HBCUs/TWIs. Results from the Satorra-Bentler Scaled likelihood ratio test (LRT) with a scaling correction for non-normality ($\chi^2_{(2)} = 3.15$) revealed no significant decrement in fit by utilizing the metric invariance model that constrained the level-1 factor loadings to be equal relative to the baseline (configural invariance) model. Thus, these results established metric invariance or equal factor loadings across the two groups. Additionally, previous researchers have tested for ME/I in multiple group multilevel CFA models by evaluating whether the level-1 and level-2 factor loadings were equivalent across separate groups (Kim et al., 2012). Yet for this study I only examined metric invariance for the factor loadings at the within-level (level-1) because previous results indicated that the variance components
measurement model provided the best fit by constraining the factor loadings at level-1 and level-2 to be equal.

I also compared the metric invariance model to a second model where all of the thresholds at the between-level (level-2) were constrained to be equal across HBCUs/TWIs. The Satorra-Bentler Scaled LRT with a scaling correction for non-normality ($\chi^2_{(12)} = 54.85$) suggested that differential item functioning existed, or that one or more thresholds were not invariant across HBCUs and TWIs. I then compared several models to determine which item thresholds appeared to non-invariant, by noting whether the LRT was significant or statistically non-significant when I constrained specific thresholds (or sets of thresholds that belonged to a particular item) to be equal across HBCUs/TWIs. Next, I selected a final, partially invariant model where I freely estimated thresholds for the items related to the frequency that students dated or studied with individuals from different racial groups across HBCUs and TWIs. A LRT test for the final, partial invariance model compared to the multiple group multilevel CFA model used to test for metric invariance indicated that the partial invariance model provided a better fit to the EDP data, ($\chi^2_{(7)} = 5.37$).

Based on the work of Byrne, Shavelson, and Muthén (1989), when multiple indicators of a construct exist and at least one item (other than the item that is fixed to one for identification purposes) is invariant, then factorial invariance (ME/I) holds and tests for structural invariance (e.g., additional tests for equal factor variances, covariances, and factor means across groups) are permitted. The thresholds freely estimated across HBCUs/TWIs in the final, partial invariance model indicated that Blacks from TWIs found the item pertaining to the frequency with which they dated outside of
their race to be more difficult (results showed an increase in item difficulty) compared to their counterparts at HBCUs. Divergent from my initial hypotheses, non-invariant thresholds from the final partial invariance model also suggested that Blacks from HBCUs found the item related to the frequency that they studied with individuals from other racial backgrounds to be more difficult relative to TWI students. Results from the final, partial invariance model are shown in Table 2.9.

DISCUSSION

Allport’s (1954) contact theory and research conducted by Gurin and colleagues has generated the foundations through which social scientists study the impact of IID on college students’ learning (e.g., active thinking skills, intellectual engagement and motivation, and academic skills) and democracy outcomes (e.g., perspective-taking, citizenship engagement, racial and cultural understanding, and judgment of compatibility among different groups in a democracy). While contact theory is used in a growing number of studies, several methodological issues arise with respect to the manner with which researchers currently define and evaluate IID (and additional measures that a similar in nature to IID), particularly when examining Blacks in college. The purpose of this study was to use a national sample of Black college students to examine the psychometric properties of six items pertaining to IID that are commonly used in psychological and educational research. More specifically, in this study I tested the factor structure of IID using a volunteer sample and a nationally representative sample of Black college students entering law school. I also used multiple group multilevel CFA models to examine whether ME/I could be established for the proposed IID scale across Black HBCU and TWI students.
Results indicated that most of my study hypotheses were supported. More specifically, findings based on EFAs performed using the volunteer sample show a unidimensional factor structure holds for four of the original six IID items. As hypothesized, these findings were replicated using the EDP core sample of 589 Black college students. Findings from the selected variance components measurement model indicated that a unidimensional factor structure fit the data using the same four IID items, while accounting for nesting and utilizing sampling weights to adjust for unequal probability in selection. Results from ME/I tests also partly supported my hypothesis that partial ME/I would be established and that differential item functioning (DIF) existed among at least two of the IID items. However, in one instance the responses from TWI students exhibited DIF and generated results divergent from my hypotheses.

Based on overall results, at first glance it may appear that researchers can be more confident in treating IID as a unidimensional construct when examining Black subsamples and that ME/I (or partial ME/I) was established, whereby measures of IID can be compared across HBCUs and TWIs. Nevertheless, while most of my hypotheses were supported, study findings provided several important implications and raised additional questions regarding the means with which researchers currently define and analyze IID among Black college samples. First, the IID items used in this study were taken from several highly cited research articles that assessed the educational benefits of IID (Antonio, 2001; Chang, 1999, 2001; Gurin et al., 2002; Shaw, 2005; Strayhorn, 2010), though only four out of the six original IID items were retained in subsequent models. In addition, the item pertaining to how often students have serious conversations with others who were different in terms of their religious beliefs, political opinions, or
personal values displayed a statistically significant, yet extremely low factor loading in each of the models tested. This item was similar to those used by Strayhorn (2010), and while it exhibited low factor loadings and was dissimilar to the other items analyzed (i.e., this particular item displayed poor face and convergent validity), its inclusion in the IID scale assessed was necessary for maintaining an identified or falsifiable model to be used when evaluating ME/I and the factor structure of IID. Retaining this particular item in the IID scales examined was also useful in terms of investigating which items to retain or exclude when creating future measures of IID. Findings from this study indicated that items like those used in Strayhorn (2010) were related to other IID items that examine the frequency with which students study, date or have close friends from other racial groups.

At the same time, given the low factor loadings for this item, it is more likely that this item does not belong in the IID scale and was a proxy for a related, yet divergent construct. Another possibility is that this item should be examined as a formative indicator or as a predictor of IID as opposed to a reflective indicator (Brown, 2006). In other words, it is plausible that students who have serious conversations with individuals who possess different beliefs and personal values were likely to endorse IID and activities pertaining to IID. Overall, additional within-group designs are needed to determine the ways that items like those analyzed in Strayhorn (2010) are correlated with IID and whether or not they should be treated as predictors (formative indicators) or as reflective indicators of IID.

Second, study results showed that the IID items pertaining to the frequency with which students discuss racial issues or attend racial/cultural awareness programs were not significantly correlated with several other IID items in the volunteer and EDP core
samples, nor did they have statistically significant, positive factor loadings in the preliminary models analyzed (see Results section). This fact is important, because it raises questions regarding the validity of measures of IID and whether many of the IID scales examined in previous studies are truly well-defined among Black college students. Another reason why this point is noteworthy is that Gurin et al. (2002) used the two IID items pertaining to the frequency that student discuss racial issues and attend racial/cultural awareness programs (these items were drawn from the CIRP data) in their seminal paper regarding the educational benefits of diversity. Given these study results, factor analyses performed on the CIRP data are likely to reveal that these two items are not conceptually similar or relevant when investigating the factor structure of IID among Black college students relative to their White peers. Yet without performing within-group studies to assess the factor structure of IID among Blacks or other racial minority groups, it is impossible to know whether these items truly captured the conceptual meaning or the academic benefits of IID in the ways that Gurin et al. (2002) and other researchers describe.

Because these two items exhibited low factor loadings and zero-order correlations in this study, it was also unclear as to whether IID is interpreted in the same way by Black students in college (compared to Whites or other racial groups). Indeed, it is possible that because Blacks constitute a small proportion of the student body at many universities, discussing racial issues or attending racial/cultural awareness programs were neither novel for these students (compared to Whites), nor were these activities salient in terms of the way Black students define IID. Black college students might also perceive these activities as a type of curricular diversity or multicultural education (see Shaw,
2005) and not as IID. Another explanation is that Black students may be less inclined to
discuss racial issues or attend racial/cultural awareness programs while interacting with
individuals from other races as a means of retaining more positive interactions, or
because Blacks fear these activities will make others uncomfortable (or that others will
respond in a way that makes Blacks feel uncomfortable). Results from Table 2.4
indicated that compared to White, Asian, or Hispanic/Latino participants in the EDP core
study, a large proportion of Black college students report that they discuss racial issues or
attend racial/cultural awareness programs on a regular basis. However, these two items
were not strongly correlated with several of the other IID items assessed in the volunteer
and EDP core data. Perhaps Black college students spend more time (compared to other
racial groups) discussing racial issues or attending cultural awareness programs with
family members or with their Black peers, though they do not consider these activities to
be a form of IID.

Third, based on the items used in this study it appeared that there could be an
overemphasis of evaluating the frequency that Blacks and minority students study, date,
or have close friends with individuals from other racial backgrounds. IID is a construct
intended to evaluate the quantity and quality of student interactions with diverse groups,
particularly diverse racial or ethnic groups. Nonetheless, many studies focus on the
frequency of IID without accounting for contextual factors, such as whether students
choose to interact with individuals from other races, whether they frequently feel happy
or anxious when interacting with diverse groups, or if they are in specific classes and
academic programs that necessitate high levels of contact (see Hurtado, 2005). The items
in this study also did not evaluate whether Black college students like or dislike
interacting with diverse racial groups, whereas it is implicitly assumed that Blacks who report a high frequency of experiences with IID have quality interracial interactions. While Blacks often comprise a small percent of the study body at many universities it is plausible that they have no choice but to spend time studying or developing interpersonal relationships with individuals from different racial backgrounds to succeed academically. None of the items evaluated in this study evaluated whether Black college students truly like/dislike or benefit/suffer from experiences of IID, nor do they assess whether under ideal circumstances, Black students would choose to spend a great deal of time studying, dating, or having close friends with individuals from other races. Results from empirical research are also likely to be obscured if additional measures of IID are not developed and tested for Blacks and other minority groups to better understand how these students define quality interracial interactions.

Fourth, researchers operationalize IID scales based on disparate item sets. As mentioned, findings from this study suggest that it is likely that IID should not be assessed in the same way for Black students compared to Whites (or other racial minority groups), because only a subset of the six items from the originally proposed IID scale were retained. This fact is important given the need to increase the generalizability of IID and generate inclusion rules for measures of IID, along with the need to improve Black college students’ retention and overall academic success. Findings from previous studies indicate that IID enhances Black students’ educational outcomes and can promote these students’ positive diversity beliefs (Antonio, 2001; Chang, 1999, 2001; Chang et al., 2006; Gottfredson et al., 2008; Gurin, 1999; Gurin et al., 2002; Hu & Kuh, 2003; Hurtado, 2005, 2007; Pettigrew, 1998; Pettigrew & Tropp, 2006; Shaw, 2005; Strayhorn,
(2010; Upton et al., 2012). On the other hand, based on findings from the present study, additional within-group studies are needed to develop improved measures of IID that cover the full domain of the construct for Black students, to generate items that do not overemphasize the frequency of IID, and to facilitate an increased understanding of contextual factors that might influence Black students’ reported level of IID. Moreover, findings from Upton, Panter, Daye, Allen, and Wightman (in preparation) suggest that the IID scale utilized in this study does not fit well when examining the subset of White students (or a subset of White and Black EDP participants combined) drawn from the EDP study. Compared to results from this study, findings from Upton et al. (in preparation) indicate that the four items pertaining to whether students discuss racial issues, study, date, or have close friends with individuals from different racial groups best define IID when examining White college students. Hence, it is plausible that measurement bias exists, such that IID should not be examined using predominantly White college samples that combine White students’ reported level of IID with those of Blacks students, and that researchers should utilize more within-group designs when assessing the impact of IID for Black college students. In addition, compared to their Black peers, White college students report that discussing racial issues is a form of IID. Perhaps White students report that discussing racial issues is a form of IID because this particular activity is more novel to Whites and provides them with further opportunities to enhance their perspective-taking ability and knowledge of issues pertaining to cultural diversity and race.

A final point is that, while analyses led to establishing partial ME/I among Black HBCU and TWI students, further studies are needed to understand more clearly why
Black TWI students have difficulty (compared to Black HBCU students) responding to the item that deals with the frequency that they date individuals from other racial groups. One reason that Black TWI students may have more difficulty with this item is that they attend universities where the possibility of engaging in interracial dating is potentially more relevant or even problematic because there are few Black students of the opposite sex who are available to date. Conversely, results show that Black HBCU students have more difficulty responding to the item relating to the frequency that they study with individuals from other racial backgrounds. While further research might be needed to identify the specific reason(s) why Black HBCU students find this item more difficult (compared to their counterparts at TWIs), it is probable that because HBCU students have significantly fewer experiences with IID, they find this particular item more difficult than Black TWI students.
Study 2: Investigating the Relationship Between Perceptions of Racial Discrimination and Informal Interactional Diversity on Black College Students’ Educational Outcomes and Beliefs Regarding the Benefits of Diversity

3.1 Introduction

Past research indicates that experiences of racial discrimination and unfair treatment are prevalent among Blacks and other minority college students (Allen, 1992; Allen & Solórzano, 2001; Ervin, 2001; Greer, 2011; Greer & Chwalisz, 2007). Prior study findings have also suggested that discrimination is perpetrated by both individuals and social institutions, and that perceptions of discrimination commonly stem from negative, differential behaviors and attitudes directed towards Blacks by predominantly White institutions or members of White majority groups. In general, research has shown that stress associated with experiences and perceptions of racial discrimination is linked to adverse academic and psychological consequences, including low self-esteem, anxiety, diminished classroom participation, and poor academic engagement (Allen, 1992; Allen & Solórzano, 2001; Ervin, 2001; Greer, 2011; Greer & Chwalisz, 2007; Harper & Hurtado, 2007; McCabe, 2009; Nora & Cabrera, 1996; Solórzano et al., 2000; Wong, Eccles, & Sameroff, 2003).

The National Center for Education Statistics [NCES; 2011] reported that between 1975 and 2010, the gap in bachelor’s degree attainment between Whites and Blacks has increased from 13 to 19 percentage points. One factor that is positively associated with increased bachelor’s degree attainment for all college students is academic engagement, and findings from the National Survey of Student Engagement (NSSE) revealed that academic engagement is associated with high educational performance and enhanced reading and
writing skills. Yet according to Harper (2009), compared to their White peers, Black college students may exhibit poor academic engagement, which is likely to negatively affect these students’ educational outcomes, standardized test scores, and bachelor’s degree attainment. Harper (2009) further argued that Black collegian’s lower level of academic engagement (when compared to the academic engagement of their White peers) can, at least in part, be attributed to the fact that they are expected to initiate interactions with faculty and students with the same ease as their White peers, while simultaneously coping with racial stereotyping.

In addition to academic engagement, a second outcome of interest for Black college students includes beliefs regarding the benefits of racial/ethnic diversity in higher education. Previous studies have indicated that endorsing the value of diversity in higher education is important because students are expected to operate within an increasingly multicultural and interconnected global society that is highly divergent in terms of race, language, ethnicity, and culture (Ervin, 2001; Hurtado, Milem, Clayton-Pederson, & Allen, 1999; Strayhorn, 2010). Past research also suggests that when students are exposed to multicultural education and learn to value diverse perspectives, this knowledge is likely to increase self-esteem and rectify educational failures among racial minorities (Ervin, 2001). At the same time, Ervin (2001) reported that Blacks with frequent perceptions of discrimination tend to have less than positive attitudes towards diversity and believe that multicultural programs are a façade that fail to resolve problems involving interracial conflict (Ervin, 2001; Nora & Cabrera, 1996). Cage (1995) similarly found that Blacks at TWIs, specifically, may become wary because they feel that they have the burden of teaching their White peers about the significance of diversity while constantly dealing with racial stereotyping and discrimination. Moreover,
findings from previous studies have shown that perceptions of racial discrimination often undermine Black college students’ self-esteem and well-being, which is likely to inhibit these students’ confidence and ability to demonstrate high levels of engagement in racially diverse settings (Allen et al., 1992; Allen & Solórzano, 2001; Branscombe et al., 1999; Harper & Hurtado, 2007; Solórzano et al., 2000; West et al., 2010).

3.1.1 IID as a Mediator and Moderator of Perceived Racial Discrimination

Despite previous research that has established linkages between perceptions of racial discrimination with Black collegian’s academic engagement and diversity-related beliefs, few studies have examined the mechanisms through which discrimination negatively impacts these students’ academic and attitudinal outcomes. One factor that researchers have failed to examine as a potential mediator (and moderator) of the relationships between perceived discrimination with Black college students academic engagement and diversity beliefs is IID. Compared to the extensive amount of research used to investigate the deleterious effects of racial discrimination, there is a paucity of studies regarding the impact of IID among Blacks in college (Strayhorn, 2010). More importantly, no studies have examined whether IID serves to mediate and/or moderate the relationships between racial discrimination with Black college students’ academic engagement and beliefs regarding the educational benefits of diversity.

Within the past twenty years, a small, yet significant body of research based on Allport’s contact theory and literature rooted in cognitive development and social psychology has suggested that IID and similar constructs (e.g., interracial contact, contact diversity, intergroup contact, interactional diversity, etc.) help to reduce prejudice and positively influence college students’ academic success and positive attitudes regarding diversity
(Allport, 1954; Antonio, 2001; Antonio et al., 2004; Chang, 1999; Ervin, 2001; Gottfredson et al., 2008; Gurin, 1999; Gurin et al., 2002; Hu & Kuh, 2003; Hurtado, 2005, 2007; Hurtado et al., 1999; Shaw, 2005; Strayhorn, 2010). Overall, there are a growing number of studies concerning IID and other, related constructs, though few researchers have used a within-group design to assess the relationships between Black college students’ experiences and reports of IID with these students’ educational outcomes and diversity-related beliefs (Strayhorn, 2010).

Utilizing a within-group design to assess the impact of IID on Black college students, as well as the mediating and moderating influence of IID in relation to perceptions of racial discrimination is valuable because of longstanding problems with prejudice and interracial contact that have led to criticisms regarding the validity of contact theory. Richeson and Shelton (2007), in particular, found that while interracial contact aids in reducing prejudice over time, it is also extremely uncomfortable for many Whites and racial minorities, whereby concerns of behaving in a prejudicial or stereotypical manner during intergroup interactions can tax individuals’ mental resources. Forbes (1997) argued that contact theory obfuscates the relationships between diverse groups and that it has more political than scientific appeal. Forbes additionally contended that there is a discrepancy between historical, persistent problems with intergroup conflict and the relationships among ethnic groups posited by Allport’s contact theory that call the validity of the contact hypothesis (i.e., contact theory) into question. For example, there are well-documented cases of tensions among neighboring peoples who have frequent contact, such as the Israelis and the Palestinians or the Indians and Pakistanis, along with persistent problems with racial conflict, race-related stress, and discrimination among Blacks and Whites in the U.S. (Forbes, 1997; Richeson & Shelton,
Thus, given Forbes’ argument, how is it that when Black college students report experiences of discrimination, they often attribute discriminatory events to high levels of contact with Whites and other racial groups, whereas frequent contact with individuals from diverse backgrounds (IID) is also purported to enhance Black students’ educational outcomes and positive diversity beliefs?

One potential explanation researchers have not previously considered is that a mediational relationship exists, such that racial discrimination is associated with reduced academic engagement and positive diversity beliefs through its harmful influence on IID. Indeed, it is possible that IID serves as a mediator, whereby perceptions of discrimination negatively affect Black students’ academic engagement and appreciation of diversity by decreasing the frequency with which these students choose to identify or interact with other groups. This, in turn, may lead to worse educational outcomes and skepticism towards the academic benefits of diversity. Solórzano et al. (2000), McCabe (2009), and Harper and Hurtado (2007) reported that Black college students consistently respond to perceptions of discrimination by seeking counterspaces or predominantly Black social and academic circles that offer protection from the psychoemotional harms of racial discrimination and provide a means of finding acceptance and validation among students’ same-race peers. The rejection-identification model and findings from Branscombe et al. (1999) similarly suggest that Blacks and other minorities assuage the effects of social rejection and discrimination by increasing their level of identification with their in-group. In addition, based on the transactional model (Lazarus & Folkman, 1984), racial discrimination can be evaluated as a stressor, such that Black students who experience racism and perceive the demands of their
academic environment exceed their available resources are likely to seek ways to cope with discrimination.

Using the transactional model as a theoretical framework along with findings reported by Solórzano et al. (2000) and Branscombe et al. (1999), it is plausible that Black college students may reduce their level of IID and generate counterspaces in response to discrimination, thereby protecting themselves from its injurious effects. Although responding to discrimination by interacting and identifying less with other races might protect these students’ well-being, this response pattern could also cause them to forego the chance to participate in informal student learning, networking, and professional development opportunities. Missing out on vital informal student learning and professional development opportunities with individuals from other racial backgrounds could subsequently lower these students’ academic engagement and beliefs about the value of diversity (Antonio, 2001; Gurin et al., 2002; Harper, 2009). Hence, a major contribution of this study is that evaluating the proposed mediational relationship could potentially shed light on the complex nature of the means through which perceptions of discrimination are inversely related to Black college students’ academic engagement and diversity-related beliefs. A second advantage of this study is that it is different from the vast majority of diversity-related research that investigates the effects of IID without acknowledging that it could have both a beneficial and a harmful influence among Black college students, particularly when examining the impact of IID in relation to discrimination experiences.

Although IID could mediate the relationships between discrimination with Black college students educational outcomes and diversity-related beliefs, previous research also suggests that IID might serve as a moderator when studying the relationships between racial
discrimination with ethnic identity and other psychological outcomes (Lee, Noh, Yoo, & Doh, 2007; Tropp, 2007). Lee et al. (2007), for example, found that intergroup contact (IID) moderates the relationship between perceptions of racial discrimination and ethnic identity. Using data from a sample of 167 Korean undergraduate students attending the Yanbian University of Science and Technology, Lee et al. (2007) argued that evaluating statistical interactions between intergroup contact and discrimination could enhance researcher’s ability to explain why the rejection-identification model is applicable to some ethnic groups, but not for all ethnic groups across every educational context. Findings from this study indicated that for Asian Americans who are willing to interact with other ethnic groups (the Han Chinese), experiences of discrimination are associated with a reduced sense of ethnic belonging or seeking social interactions and acceptance within one’s ethnic group (Lee et al., 2007). Alternatively, Lee et al. (2007) postulated that if minorities have little contact (IID) and fail to develop friendly, meaningful relationships with majority group members, then they may be motivated to seek belonging within their in-group, and the negative effects of discrimination are intensified.

Thus based on the transactional model, the rejection-identification model and hypotheses from Lee et al. (2007), it is possible that for Black college students with low IID, the inverse relationships between racial discrimination with students’ academic outcomes and diversity beliefs are more strongly negative. More specifically, for Black collegians with low levels of IID, it is likely that these students form counterspaces and forego important, diverse student learning opportunities. Conversely, for Black college students with high levels of IID, it is probable that these students develop amicable relationships with individuals from other racial backgrounds or become more accustomed to spending time with diverse groups,
whereby the deleterious effects of discrimination are mitigated. College students who experience discrimination but have high levels of IID may also be in a better position than those with low levels of IID to understand that not all out-group members are hostile, and that overall, diversity provides a number of academic advantages. Increased levels of IID could additionally change students’ attributions about why discrimination occurs and how it is likely to affect them in the future.

Taken together, investigating whether IID moderates the relationships between racial discrimination with Black college students’ academic engagement and diversity-related beliefs is important, because doing so could aid to facilitate researcher’s understanding as to why perceptions of racial discrimination are associated with reduced academic performance and negative psychological outcomes for some Black college students, but not for others. Performing analyses to evaluate IID as a moderator of perceptions of racial discrimination is also similar to the majority of past studies that utilize the transactional model to evaluate different coping strategies (IID) as buffers or protective factors against stress (racial discrimination). Yet, the exploratory models proposed in this study are somewhat different from the majority of those tested in previous research, in that reducing one’s level of IID, as opposed to increasing IID or choosing to interact more with other racial groups is hypothesized to protect or buffer against feelings of isolation and rejection stemming for racial discrimination. In addition to examining IID as a moderator, the models investigated in this study also are divergent from prior studies that utilize the transactional model, because they simultaneously test whether IID mediates or helps to explain, at least in part, why some Black undergraduates’ response to racial discrimination subsequently leads to decreased academic engagement and beliefs in favor of diversity.
3.1.2 The Racial Composition of Students’ College Environment

In addition to perceptions of racial discrimination prior research suggests that the racial composition of Black students’ college environment (i.e., whether students attend a HBCU or a TWI) plays a role in determining students’ educational outcomes (Allen, 1992; Allen & Solórzano, 2001; Ervin, 2001; Greer & Chwalisz, 2007). Given the increase in Black college student enrollments, university administrators are generally encouraged to find ways to facilitate academic achievement among Black college students’ and to teach students the value of diversity. Nevertheless, the goals that educators and university administrators are expected to meet are seemingly contradictory. On the one hand, university administrators are compelled to promote multicultural education and encourage informal interactions between Blacks and individuals from other races, which are likely to increase Black students’ educational outcomes and positive attitudes toward diversity (Antonio, 2001; Gurin et al., 2002; Shaw, 2005). On the other hand, educators and administrators at TWIs, specifically, are often encouraged to produce a critical mass of Black college students to allow these students the opportunity to form academic and social networks within their particular in-group (i.e., counterspaces), and to protect them from the negative influence of racial isolation, tokenism, and perceived discrimination (Harper & Hurtado, 2007; McCabe, 2009; Solórzano et al., 2000).

At first glance it appears that Blacks at HBCUs and other racially segregated environments accrue more educational benefits by systematically avoiding IID and discriminatory practices that may decrease these students’ willingness to identify or interact with Whites and other racial groups. However, it is incorrect to uniformly conclude that Black HBCU students do not encounter incidents of racial discrimination (see Greer, 2008).
While a number of Blacks at TWIs and other desegregated educational environments may experience high levels of racial discrimination, it is also incorrect to assume that education at TWIs is harmful for all Black students or that Black college students respond similarly to perceptions of racial discrimination. Not every Black college student who experiences racial discrimination has poor educational outcomes or chooses to limit the level with which they interact with Whites or other minority groups (Allen, 1992; Greer & Chwalisz, 2007). In some instances, perceptions of racial discrimination may compel Black HBCU and TWI students to work harder to prove that they are just as competent as their White peers, and many Black college students might choose to increase their interactions with Whites to refute prejudicial beliefs (Upton et al., 2012). Prior research concerning IID also reveals that students from all races generally benefit from diversity and that positive educational patterns exist for Blacks and students from other racial groups at TWIs, irrespective of their perceptions of campus racial climate (Gurin et al., 2002; Hurtado, 2007). Thus, more studies are needed to investigate whether the complex relationship between IID and perceptions of racial discrimination and its influence on Black collegian’s academic engagement and diversity-related beliefs differs depending on students’ college racial composition.

3.2 Proposed Research Questions and Hypotheses

1. Is IID positively related to Black students’ beliefs regarding the educational benefits of diversity, and to these students’ self-reported academic engagement, above and beyond perceptions of racial discrimination (or unfair treatment), college racial composition and other covariates?

- **Hypothesis 1**: Based on prior studies regarding the academic benefits of IID, I expect that IID will be positively related to the two study outcomes (e.g., diversity beliefs
and academic engagement) above and beyond perceptions of discrimination (or unfair treatment), college racial composition, and other study covariates.

2. Are the relationships between Black college students’ perceptions of racial discrimination (or unfair treatment) with students’ diversity beliefs and academic engagement mediated and moderated by IID when evaluating students’ diversity beliefs and academic engagement?

- **Hypothesis 2:** Mediation (or partial mediation) will exist, such that perceptions of racial discrimination (and unfair treatment) are associated with reduced endorsement of diversity in higher education through IID. When examining mediation, in particular, I predict that perceptions of racial discrimination will be inversely related to IID and to students’ diversity beliefs, and that, in turn, IID will be positively related to students’ diversity beliefs.

- **Hypothesis 3:** IID will moderate the relationship between perceptions of discrimination (and unfair treatment) when examining Black students’ diversity-related beliefs. Based on hypotheses from Lee et al. (2007), I expect that for Black students with low levels of IID, the relationship between racial discrimination (or unfair treatment) and students’ beliefs regarding diversity in higher education will be more strongly negative. For Black students with high levels of IID, I expect that the relationship between racial discrimination (and unfair treatment) and students’ diversity beliefs will be more strongly positive.

- **Hypothesis 4:** Mediation (or partial mediation) will exist, such that perceptions of racial discrimination (or unfair treatment) would be associated with diminished levels of academic engagement through IID. More specifically, I predict that perceptions of
racial discrimination (or unfair treatment) will be inversely related to IID, and to students’ self-reported level of academic engagement. I additionally predict that IID will be positively related to academic engagement.

- **Hypothesis 5**: I hypothesize that IID moderates the relationship between perceptions of racial discrimination (or unfair treatment) and students’ academic engagement. In particular, I hypothesize that for students with low levels of IID, the relationships between racial discrimination and students’ academic engagement will be more strongly negative. Alternatively, for Black students with high levels of IID, I predict that the relationships between racial discrimination and students’ academic engagement will be statistically non-significant.

### 3.3 Sample and Participants

Data for this investigation are drawn from the EDP core sample based on 50 ABA-approved U.S. law schools. Analyses focus on students who identified as Black (n = 589), which consists of roughly one-tenth (10%) of the total participants. The mean household income reported for Blacks in the EDP core sample ranged from $50,000 to $99,999 per year. Women comprised the majority of the sample (68%). In addition, 13% of participants achieved a master’s degree, professional degree or higher and 87% earned a bachelor’s degree prior to entering law school. For further information regarding the EDP sample, refer to Study 1.

### 3.4 Procedure

Information regarding the procedures and sample used are analogous to those in Study 1.
3.5 Measures

*Informal interactional diversity (IID)* was defined using three of the four IID items taken from in the final models in Study 1 to generate the measure utilized in the current study ($\alpha = .77$). The IID items were rated using a five-point Likert scale ranging from 1 (*never*) to 5 (*very often*): “During your undergraduate years, how often did you have close friends from a different racial/ethnic group,” “During your undergraduate years, how often did you date someone from a different racial/ethnic group,” and “During your undergraduate years, how often did you study with someone from a different racial/ethnic group.”

*Diversity beliefs* ($\alpha = .72$) consisted of a four item scale created by the EDP research team: 1 (*strongly disagree*) to 5 (*strongly agree*): “My own ability to work and get along with others has been enhanced significantly by interactions that I have had with others from a different racial/ethnic background than my own,” “A more racially diverse student body can challenge all students to think about different viewpoints,” “I believe that I am a more effective critical thinker when I consider carefully points of view other than my own,” “A more diverse student body hinders students’ ability to work together (reverse coded).”

*Student engagement* ($\alpha = .62$) was measured based on seven items derived from the Law School Survey of Student Engagement (LSSSE). These items were rated using a four-point Likert scale ranging from 1 (*never*) to 4 (*very often*). The items were as follows: “Thinking about your last year in college, please indicate how often you prepared two or more drafts of a paper or assignment before turning it in,” “Thinking about your last year in college, please indicate how often you contributed to class discussions,” “Thinking about your last year in college, please indicate how often you chose to work in a study group with other students,” “Thinking about your last year in college, please indicate how often you
actively debated students in class if you did not agree with their viewpoints,” “Thinking about your last year in college, please indicate how often you used email to communicate with a faculty member,” “Thinking about your last year in college, please indicate how often you discuss assignments with a faculty member,” and “Thinking about your last year in college, please indicate how often you talked about career plans with a faculty member or advisor?”

Perceptions of racial discrimination and unfair treatment were evaluated using a dichotomous measure based on student reports of whether they experienced racial discrimination during their undergraduate years, along with a continuous measure representing student reports of experiences of racial microaggressions or unfair treatment. Experiences of perceived discrimination consists of a dichotomous item measuring student reports of racial discrimination taking place during students’ time as undergraduates. The item was rated such that 0 (no); 1 (yes): “Do you feel you have ever experienced discrimination or adverse treatment due to your race or ethnicity during your years as an undergraduate?”

Students’ perceptions of unfair treatment ($\alpha = .90$) were examined using nine items taken from the Everyday Discrimination Scale (EDS) created by Williams, Yu, Jackson, and Anderson (1997). The items were rated on a six-point scale ranging from 1 (never) to 6 (almost every day), and do not include students’ reports of whether unfair treatment could be attributed to their race or ethnicity. The nine items included in the EDS asked incoming law school students to report the frequency with which other people treated them with less courtesy, they are treated with less respect, they received poorer service than other people at restaurants or stores, they are treated as if they are not smart, people act is if they are afraid
of them, people act as if they are dishonest, people act is if they are better, students are called names or insulted, and students are threatened or harassed.

Racial composition of college environment (students enter law school from a HBCU or a TWI) was divided up such that most Black EDP respondents (66.6%; n = 389) previously attended a TWI and approximately thirty percent (33.4%; n = 195) attended a HBCU. HBCUs were defined using a list of historically Black colleges provided by the U.S. Department of Education (2010) White House Initiative on Historically Black Colleges and Universities. College racial composition was used as a control variable in path analyses utilized to address the first two hypotheses. For the analyses used to determine whether ME/I holds across HBCUs and TWIs for unfair treatment, student diversity beliefs, and academic engagement, HBCUs (coded 1) were used as the focal group and TWIs (coded 0) were treated as the reference group.

Student-level covariates and predictors included: age, perceptions of racial discrimination (and unfair treatment), gender (0 = Male or 1 = Female), family household income, college racial composition, the highest level of education students obtained prior to entering law school (0 = achieved a bachelor’s degree or 1 = achieved a master’s degree, professional degree or higher), and marital status (0 = single, divorced or widowed or 1 = married. Family household income is coded as: 1 (family household annual income below $10,000); 2 (family household annual income ranging from $10,000 to $49,999); 3 (family household annual income ranging from $50,000 to $99,999); 4 (family household annual income ranging from $100,000 to $149,999); 5 (family household annual income ranging from $150,000 to $199,999); 6 (family household annual income ranging from $200,000 to $299,999); 7 (family household annual income ranging from $300,000 to $399,999); 8
family household annual income ranging from $400,000 to $499,999); 9 (family household annual income over $500,000). Age, IID, unfair treatment, and family household income variables are mean-centered prior to performing the final analyses.

3.6 Analysis Plan

Using Mplus 5.2 software, I tested the factor structure of Black students’ diversity beliefs, student engagement, unfair treatment, and the newly revised IID scale based on multilevel EFA models using a CFA framework (multilevel E/CFA models) that accounted for the categorical nature of each of the items used. According to Brown (2006), E/CFA models are a highly underutilized in social science research yet they have several benefits over standard EFAs. Several advantages that E/CFAs provide are significance tests for item factor loadings, and these models allow researchers to evaluate residual covariances and other measures which often cause problems with model misfit that cannot be assessed using standard EFA. By definition, an E/CFA is a CFA model that is re-parameterized to provide equivalent indices of model and component fit (e.g., chi-square, TLI, CFI, RMSEA, factor loadings, thresholds) as a standard EFA, though E/CFAs also provide significance tests and modification indices that help to identify potential sources of model misfit (Brown, 2006).

After the factor structure for the two study outcomes (diversity beliefs and academic engagement) and the newly constructed IID scale were assessed, I used multiple group multilevel CFA models using mixture models to test for ME/I across HBCUs/TWIs for perceptions of unfair treatment and each of the study outcomes. In the event that there was not enough between-law school variance to examine multilevel E/CFA or multilevel multiple-group CFA models, I utilized single-level EFA and multiple-group CFA models were used to examine the factor structure and measurement properties of these item. Based
on the final multiple-group results and tests of ME/I, I created factor scores for each scale that is evaluated, and alpha coefficients were calculated to evaluate internal consistency.

To test the first study hypothesis, I performed correlational analyses in SAS 9.2. Path analyses with observed variables (observed measures for IID, academic engagement, students’ diversity beliefs, and reports of unfair treatment are based on factor scores created after testing for ME/I) were examined in Mplus 5.2 to determine whether IID was positively related to the study outcomes (beliefs regarding the educational benefits of diversity and student engagement) while controlling for college racial composition, perceptions of discrimination, and other covariates. I also analyzed path analyses using sampling weights to account for the multistage random sampling strategy employed in the EDP study. Moreover, in each of the path models tested, I performed analyses using sandwich estimation via the “type=complex” option in Mplus to correct for dependence resulting from students nested within law school institutions and the hierarchical structure of the EDP design. For this study, I used a sandwich estimator instead of multilevel models to account for students nested within schools because preliminary models tested with random intercepts and random slopes did not converge as a result of having minimal variance across law school institutions (Bauer, Preacher & Gil, 2006).

To address the second hypothesis, path analyses with sampling weights and a sandwich estimator were also developed using models that are similar to those proposed by Preacher, Rucker, and Hayes (2007) to investigate whether IID mediates and moderates the relationships between discrimination (or unfair treatment) with the two study outcomes. Ideally, it is advantageous to use longitudinal data when testing mediating processes².

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² Given that the measures examined pertain to students’ undergraduate experiences, a
because mediation models operate under the assumption that the temporal ordering of variables is clear and that the predictor precedes the mediator and subsequently, that the mediator occurs before the outcome (MacKinnon, 2008).

The final models used to address the second hypothesis were similar to what Preacher et al. (2007) referred to as “Model 1” when describing analyses for moderated mediation that utilize nonlinear constraints. By definition, moderated mediation or what is also known as a conditional indirect relationship occurs when the magnitude of an indirect (or mediated) relationship depends on one or more values of a moderator (Preacher, Rucker, & Hayes, 2007). For the specific set of analyses investigated in this study, models are generated to test whether IID serves to mediate and moderate the relationships between perceived discrimination with students’ academic engagement and diversity-related beliefs. According to Preacher et al. (2007) another statistically equivalent, conceptual means with which to interpret the model proposed to address the second hypothesis is to test for moderated mediation, such that the relationships between IID and the two study outcomes are moderated by perceptions of discrimination or whether students report experiences of perceived discrimination (or unfair treatment). Furthermore, in the analyses used to address the second justifiable argument could be made that it was preferable to account for the nesting of students within undergraduate institutions. Yet overall, the same results were obtained in most of the final models, irrespective of whether I accounted for the nesting of students within law schools or the nesting of students within undergraduate institutions. Also, when investigating reports of discrimination among the Black subsample at time two, there was an attrition rate of over 75%, such that only 135 of the original 589 Black participants measured in 2004 (time 1) provided information regarding their experiences with IID and perceptions of racial discrimination in law school. In addition, 64 of the remaining 135 Black EDP participants at time two reported having perceptions of discrimination (or unfair treatment), yet none of the measures assessed at time two asked students whether they attributed perceptions of discrimination (or unfair treatment) to their race or ethnicity. Because the final measure of discrimination at time two did not evaluate whether students attributed perceptions of discrimination to their race or ethnicity, this also precluded any opportunity to measure Black students’ perceptions of racial discrimination over time.
hypothesis, models similar to those derived by Preacher et al. (2007) were generated as follows:

\[ IID = a_0 + a_1 \text{Discrimination} + \ldots + r \]  
\[ \text{Study Outcome} = b_0 + b_1 IID + (c' + b_2 IID) \text{Discrimination} + \ldots + r \]  

Equation 5 depicts analyses used in this study to test whether IID mediates and moderates the relationships between perceptions of racial discrimination with the two study outcomes. In Equation 5, the regression equations had two intercept terms, denoted \( a_0 \) and \( b_0 \), and a regression residual, denoted \( r \) (see Preacher et al., 2007). Alternatively, based on analyses proposed by Preacher et al. (2007), rearranging the terms in Equation 5 would provide the opportunity to test the conditional indirect influence of racial discrimination (or unfair treatment) on either of the two study outcomes, such that racial discrimination (or unfair treatment) serves to moderate the relationship between IID with academic engagement or students’ diversity beliefs.

A path diagram of the exploratory conceptual model used to test whether IID mediated and moderated the relationships between perceptions of racial discrimination (or unfair treatment) with the two study outcomes is displayed in Figure 3.1. Finally, to address the third hypothesis, I used multiple-group path analyses and the Satorra-Bentler Scaled likelihood ratio test (LRT) with a scaling correction for non-normality to determine whether the mediating and moderating influence of IID on the relationships between discrimination and the two study outcomes differed depending on college racial composition.

RESULTS

Results based on descriptive statistics and zero-order correlations between the revised measure of IID, perceptions of discrimination and unfair treatment, academic engagement,
and other study variables are shown in Table 3.1. Also, demographic characteristics and reports of IID for Black students that were divided based on whether students attended a HBCU or a TWI are shown in Table 3.2. Findings from E/CFA models used to examine the factor structure of IID, unfair treatment, diversity beliefs, and academic engagement also verified that a unidimensional factor structure held for each of the constructs. More specifically, results from models used to test the factor structure of the revised IID scale show good component fit when using the between and within measurement model with one of the residual variances fixed at zero (model fit indices are not available, as the revised measure is only comprised of three items), with factor loadings ranging from .41 to .84. The model used to examine unfair treatment did not converge using multilevel E/CFAs, though after estimating a single-level E/CFA model with three residual covariances, the model converged and factor loadings ranged from .55 to .89. Results from the single-level E/CFA model for unfair treatment showed acceptable overall fit: $\chi^2(8, N=586) = 38.13, p < .05; \text{CFI}=.99; \text{TLI}=.99; \text{RMSEA}=.08$.

The construct representing students’ beliefs regarding the educational benefits of diversity did not converge when using a multilevel E/CFA model, yet results based on a single-level E/CFA displayed excellent model fit: $\chi^2(4, N=571) = 5.87, p > .05; \text{CFI}=.99; \text{TLI}=.99; \text{RMSEA}=.03$. The factor loadings for the model used to test the construct representing students’ beliefs regarding the educational benefits of diversity ranged from .37 to .90. When examining academic engagement, indices also exhibited acceptable model fit based on a unidimensional, single-level E/CFA model, with statistically significant factor loadings ranging from .19 to .85: $\chi^2(7, N=582) = 35.25, p < .05; \text{CFI}=.95; \text{TLI}=.95; \text{RMSEA}=.08$. Finally, prior to generating factor scores for each of the measures examined,
tests for ME/I for each of the constructs examined indicate that measurement invariance or partial measurement invariance held across HBCUs and TWIs.

**Question 1**

The first hypothesis was assessed to determine whether IID was positively related to the two study outcomes, above and beyond perceptions of racial discrimination (and unfair treatment), college racial composition, and other study covariates (e.g., age, household income, gender, marital status, and highest level of education). Results were reported after performing regression diagnostics and examining Mardia’s test of multivariate normality, the Mahalanobis Distance, the variance inflation factor for each independent variable, and testing for normality and homogeneity of residuals. The variance inflation factors for perceptions of racial discrimination, unfair treatment, and their interactions or product terms with IID ranged from 9.29 to 23.35 for the two study outcomes (e.g., diversity beliefs and academic engagement). Hence, to avoid problems with multicollinearity, I examined separate models used to evaluate perceptions of racial discrimination and unfair treatment.

In the final models used to address the first hypothesis, I estimated correlations between the two study outcomes while simultaneously examining the influence of IID, perceptions of racial discrimination, and other study variables. Using an alpha level of .05 and unstandardized regression coefficients, results from the first model that includes perceptions of discrimination (this model does not include unfair treatment) as a predictor (Model 1) showed that students with high levels of IID endorsed beliefs in favor of the educational benefits of diversity in higher education ($B = .12$, $SE = .05$). Findings from Model 1 additionally suggested that IID was positively related to students’ academic engagement ($B = .12$, $SE = .06$), above and beyond perceptions of racial discrimination,
college racial composition, and other covariates. Results from the second model (Model 2) used to analyze the influence of IID while accounting for student reports of unfair treatment (this model does not include perceptions of racial discrimination) and other study covariates again indicated that IID had a positive and statistically significant influence on both of the two study outcomes. Moreover, findings for Models 1 and 2, including unstandardized regression coefficients, standard errors, and R-square for each study outcome are displayed in Tables 3.3 and 3.4. Fit indices for Models 1 and 2 were not available, as the models are just-identified.

Question 2

The second hypothesis investigated whether IID served to mediate and moderate the relationships between perceptions of racial discrimination with the two study outcomes while controlling for college racial composition and other study covariates (e.g., college racial composition, age, household income, gender, political orientation, and highest level of education). Overall, findings showed that IID did not mediate or moderate the relationships between student reports of unfair treatment with students’ diversity beliefs and academic engagement (see findings shown in Figures 3.2). Thus, any further results reported only pertain to models examining the mediating and moderating influence of IID in relation to perceptions of racial discrimination. Findings from the final model analyzed (Model 3), along with separate results using the “Model Indirect” command in Mplus to test for mediated effects, show that discrimination is indirectly related to students’ positive diversity beliefs through IID ($B_1 \times B_2 = .14, \ SE = .07$). Results from Model 3 also suggested that perceptions of racial discrimination were indirectly related to positive beliefs regarding the educational benefits of diversity in higher education through IID. Hence, these results indicated that
students with discriminatory experiences tend to report high levels of IID, which in turn, was associated with beliefs in favor of diversity in higher education in higher education. This particular finding did not support my original hypotheses, though an argument could be made that Black college students who reported experiences and perceptions of racism were more likely to have frequent interactions with Whites and individuals from other races, and that IID subsequently increased these students’ positive diversity beliefs. Divergent from my hypotheses, findings from Model 3 further revealed that perceived discrimination did not moderate the relationship between IID and Black collegians’ diversity-related beliefs ($B = .16, SE = .09$).

When evaluating Black college students’ academic engagement, results from Model 3 and additional analyses using the “Model Indirect” in Mplus suggest that perceived discrimination is indirectly related to enhanced levels of academic engagement through IID ($B_1 \times B_2 = .15, SE = .07$). Findings from Model 3 also indicated that IID does not moderate the relationship between perceptions of discrimination and academic engagement ($B = .03, SE = .09$). Fit indices for Model 3 additionally reveal excellent model fit:

$\chi^2 (I, N = 589) = .81, p > .05; CFI=1.00; TLI=1.00; RMSEA< .01$. Results from Model 3, including unstandardized regression coefficients, standard errors, and R-square are displayed in Figure 3.2.

**Question 3**

The third study hypothesis was examined to determine whether the mediating and moderating influence of IID differed depending on whether students attended a HBCU or a TWI. As a first step, I analyzed a full model used to investigate the mediating and

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3 No covariates were included in these analyses. This is due to the fact that there were a large
moderating influence of IID on the relationships between perceptions of racial discrimination and the two study outcomes: $\chi^2(3, N = 589) = .79, p > .05$; CFI=1.00; TLI=1.00; RMSEA=.00. Next I estimated a second, null model where all of the regression coefficients and item covariances from the initial model are constrained to be equal across HBCUs and TWIs: $\chi^2(10, N = 589) = 4.70, p > .05$; CFI=1.00; TLI=1.00; RMSEA=.00. As a final step, I used the Satorra-Bentler Scaled LRT to determine whether the full model (the first model) versus the null or constrained model (the second model) provided a better fit to the data: $(\chi^2_7 = 8.83)$. Using an alpha level of .05, results from the Satorra-Bentler Scaled LRT were statistically non-significant and indicated that the mediating and moderating capacity of IID on perceptions of racial discrimination (along with any of the other regression coefficients tested) did not differ with respect to college racial composition or whether students previously attended a HBCU or a TWI.

**Examining Alternate Pathways**

Because the EDP study is comprised of survey data that were measured at only one time point, such that perceptions of discrimination, IID, and the two study outcomes were assessed concurrently (i.e., each measure pertains to students’ experiences during their years as undergraduates), it is impossible to draw any causal links between IID as a proposed mediator for the two study outcomes (MacKinnon, 2008). The fact that a cross-sectional, non-experimental research design was utilized also precluded any opportunity to draw conclusions regarding temporal precedence or the proposed directionality of the indirect relationships between perceptions of racial discrimination and the two study outcomes.
through IID. For each of the models tested, the proposed time ordering among the variables is based on theory and results from prior research. Because the direction of influence cannot be determined in this study, alternate models that evaluated perceived discrimination as a mediator of IID could also be used (MacKinnon, 2008).

Thus, my next step was to analyze an additional model (Model 4) using WLSMV estimation with a sandwich estimator and nonlinear constraints to assess whether the dichotomous item measuring perceptions of racial discrimination mediates or indirectly influenced the relationships between IID with students’ diversity beliefs and academic engagement. In this particular model, probit regression via the normit link function was used because past research suggests that probit regression provides more accurate results when testing mediation models with categorical outcomes (MacKinnon, 2008).

While findings from Model 2 indicated that perceptions of racial discrimination predicted IID, results from Model 4 alternatively revealed that IID served to predict racial discrimination ($B = .06, SE = .02$). Thus, it appears that Blacks with increased levels of IID are likely to report experiences and perceptions of racial discrimination during their years as undergraduates. Findings from Model 4 also suggested that the relationship between IID and students’ positive diversity beliefs was not mediated by perceptions of discrimination ($B_1 \times B_2 = .01, SE = .01$). Findings from Model 4 additionally revealed that perceptions of racial discrimination were not directly related to academic engagement ($B = .01, SE = .28$) while controlling for IID and other study covariates, nor did perceptions of discrimination mediate the relationship between IID and students’ academic engagement ($B_1 \times B_2 = .01, SE = .02$). Fit indices for Model 4 were as follows: $\chi^2 (1, N = 582) = .45, p > .05; CFI=1.00; TLI=1.00$.

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4 The same overall results were obtained when using MLR estimation with logistic regression.
RMSEA=.00. Given the fact that this study utilizes cross-sectional survey data, additional models could also be used to test whether diversity beliefs predicted IID (and students’ perceptions of discrimination). Yet no further models were tested, given the fact that prior theory indicates that IID generally serves as a predictor of college students’ openness to diversity (Flowers & Pascarella, 1999; Gurin et al., 2002; Pike & Kuh, 2006; Shaw, 2005). Results from Model 3, including unstandardized regression coefficients, standard errors, and R-square are displayed in Figure 3.3.

DISCUSSION

This study investigated whether IID impacts Blacks in college, above and beyond students’ reports of perceived racial discrimination. More importantly, this study was the first of its kind to utilize a within-group design to examine whether IID serves to mediate and moderate the relationships between perceived racial discrimination with students’ diversity-related beliefs and academic engagement. On the whole, several findings from this study were divergent from my original hypotheses, though all of the results provide important implications for future research.

The first set of results was consistent with my hypotheses and suggested that IID was positively correlated with beliefs in favor of diversity as well as students’ academic engagement (see Table 3.1). More specifically, findings from Models 1 and 2 revealed that IID was positively associated with Black college students’ academic engagement and beliefs regarding the educational benefits of diversity, even when accounting for students’ perceptions of racial discrimination or unfair treatment. Taken together, these findings support results from previous research that suggest IID and similar constructs are associated with college students’ openness to diversity and enhanced academic success (Antonio, 2001;
Findings from this study also add to extant research because they suggest that IID positively influences Black college students’ endorsement of diversity and increases their participation in academically engaging activities, irrespective of students’ college racial composition or whether they experience negative, discriminatory events.

At the same time, it is important to acknowledge that results from Model 1 showed that the squared multiple correlation for academic engagement was .10, and the squared multiple correlation for the diversity beliefs outcome was .05. Thus, perceptions of racial discrimination, IID, and other covariates only account for a minimal amount of variance in the two study outcomes. This fact suggests that additional predictors were needed to better explain academic engagement and beliefs regarding the educational benefits of diversity for this particular population. Indeed, it is possible that future models used to investigate whether other factors, such as the value students place on education and working to achieve their academic and professional goals, or students’ reported level of public regard, private regard, and racial ideology (e.g., humanist ideology, nationalist ideology, assimilationist ideology, and oppressed minority ideology) can aid in explaining the variance in academic engagement and students’ diversity-related beliefs. For example, future studies using tests of moderated mediation could be used to determine if the relationships between perceptions of discrimination with increased academic engagement and positive diversity beliefs through IID depend on whether Black collegians believe that assimilating with Whites and other

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5 The same set of results was also obtained using the original, four item measure of IID drawn from Study 1.
racial groups is more important than endorsing a Black nationalist ideology (or an oppressed minority ideology).

While a number of studies do not examine the factor structure of IID, findings from this study suggested that when using a within-group design to test the factor structure and measurement properties of IID, Black collegians who have frequent contact with individuals from diverse racial backgrounds displayed increased academic engagement and positive diversity beliefs. These findings were consistent with results from prior research that uses predominantly White samples to examine the academic benefits of IID (Antonio, 2001; Daye, Panter, Allen, & Wightman, 2012; Gurin et al., 2002; Huh & Kuh, 2003), and show that IID has a positive educational impact on Blacks in college. These findings were also noteworthy because of recent challenges concerning affirmative action and the use of race sensitive college admissions, such as the ongoing Fisher v. the University of Texas at Austin Supreme Court Case. In Fisher, a high school student who was denied entrance into the University of Texas at Austin is requesting that the Supreme Court either declare that the University of Texas’ admissions policies are inconsistent with those derived from the 2003 Grutter case, or that the Supreme Court overturns its previous ruling in Grutter and thereby eradicates affirmative action. Because results from the present study provide further evidence to suggest that race sensitive college admissions benefit Black students by providing them the opportunity to have frequent interactions with individuals from diverse groups, it appears that eliminating affirmative action could significantly decrease the academic engagement and success of Blacks in college. Moreover, based on these results, a second implication is that future within-group studies may be useful when testing the factor structure, measurement properties, and influence of IID on Hispanic/Latino and Asian American college students to
further investigate the educational benefits of diversity and the ways in which these students could be affected in the event that affirmative action is eliminated.

While the previous findings discussed are consistent with my original hypotheses, an unexpected set of results from Model 3 suggested that perceived discrimination is indirectly associated with increased academic engagement through IID. These findings were contrary to those from prior studies that show perceptions of racial discrimination have a detrimental effect on Black collegian’s academic engagement and educational success (Allen, 1992; Allen & Solórzano, 2001; Cage, 2005; Ervin, 2001; Greer, 2011; Greer & Chwalisz, 2007; Harper, 2009; Harper & Hurtado, 2007; McCabe, 2009; Nora & Cabrera, 1996; Solórzano et al., 2000; Wong, Eccles, & Sameroff, 2003). One possible explanation for this unexpected set of results concerns the fact that the sample used in this study was comprised of academically successful Black college students who were entering their first year of law school. Given that these students are high-achievers who had already earned a bachelor’s degree or higher, it is possible that compared to other Blacks in college, this particular group exhibited increased levels academic engagement, even when experiencing racial discrimination. Indeed, these results could simply be attributed to the fact that responding to discrimination by becoming more academically engaged is a characteristic unique to educationally successful Black men and women who aspire to practice law (see Upton et al., 2012).

A second explanation for results indicating that perceived discrimination is indirectly associated with increased academic engagement through IID could be that the students in this study were likely to respond to perceptions of racial discrimination by working harder to prove others wrong, which, in part, could explain the positive, indirect relationship between
perceived racial discrimination and academic engagement through IID. In other words, the relationship between discrimination and academic engagement through IID might be explained by the fact that Blacks who aspire to practice law tend to react assertively to discrimination by increasing their level of interracial contact (IID), and subsequently becoming more academically engaged. At the same time, while these students may be inclined to deal with discrimination by increasing their level of contact with individuals from different racial backgrounds and consequently increasing their academic engagement, past research shows that John Henryism and other, similar responses to discrimination often lead to mental health risks and to poor well-being (Clark, Anderson, Clark, & Williams, 1999; Landrine & Klonoff, 1996). John Henryism is a coping strategy that was created based on John Henry, a historical figure from American folklore who worked himself to death to beat a steam engine. Moreover, John Henryism is a coping style commonly used by many Black Americans, such that they work harder to succeed when faced with adversity.

Another unanticipated set of results stemming from Models 1 and 3 suggested that racial discrimination was related to positive beliefs regarding the educational benefits of diversity. Results from Models 1 and 3 also indicated that IID partially mediated the relationship between discrimination and positive diversity beliefs, such that perceptions of racial discrimination were associated with high levels of IID, which in turn, was related to endorsing beliefs in favor of diversity. Few studies have assessed Black collegian’s beliefs regarding the educational benefits of diversity, and the small amount of research used to assess the association between Black college students’ perceptions of discrimination and their diversity-related beliefs reveals that an inverse relationship exists (Cage, 1995; Nora & Cabrera, 1996). Divergent to previous research findings, results from this study suggested
that frequent contact with individuals from diverse racial backgrounds serves, in part, as a
generative mechanism through which perceptions of racial discrimination are associated with
Black college students’ positive attitudes regarding diversity. One potential reason why study
results suggest that perceptions of racial discrimination were positively associated with
students’ endorsement of diversity could be that discrimination causes Black students to
better understand the value of diversity or IID as a means of mitigating both individual and
societal forms of prejudice. Another explanation for these results is that despite harmful,
discriminatory events, Black collegians view IID as a potential means with which to enhance
their academic success, to improve race relations over time, and to reduce prejudicial
attitudes among students from diverse racial backgrounds.

Although IID might serve to partially mediate the relationship between perceived
racial discrimination and students’ positive diversity beliefs (see findings from Model 3),
results from Model 4 also suggested that perceptions of racial discrimination did not mediate
or indirectly influence the relationship between IID and students’ diversity beliefs. Overall,
the most intriguing set of results from this study stem from Models 3 and 4, which have the
potential to provide divergent, yet equally meaningful explanations for the processes through
which IID and perceptions of racial discrimination impact Black collegian’s diversity-related
beliefs. On the one hand, results from Model 3 suggested that reports of racial discrimination
were associated with high levels of IID, which subsequently led to positive attitudes
regarding diversity. On the other hand, findings from Model 4 indicated that high levels of
IID led to increased reports of racial discrimination. The data utilized in this study do not
provide the opportunity to deduce whether IID predicts the relationship between perceptions
of racial discrimination and students’ diversity beliefs, or whether racial discrimination
predicts the relationship between IID and students’ diversity-related beliefs. An extensive, longstanding body of research shows that racial discrimination is prevalent among Blacks in college and that perceptions of racial discrimination generally serve to predict these students’ academic and psychological outcomes, whereas there is currently a dearth of research that evaluates the conceptual meaning or the impact of IID on this particular population. Therefore, based on findings from past research that has tested the measurement properties and predictive validity of perceptions of racial discrimination on Black college students’ academic and psychological outcomes, it is likely that the original models proposed (see Figure 3.1) accurately depict the means with which racial discrimination and IID influence these students’ diversity-related beliefs. Moreover, additional research using longitudinal and experimental methods is ultimately needed to assess temporal precedence and the direction of influence between IID and perceptions of racial discrimination when predicting Black college students’ beliefs regarding the educational benefits of diversity (or students’ reported level of academic engagement).

The final set of unexpected results revealed that IID did not moderate the relationships between perceptions of racial discrimination with students’ academic engagement and diversity-related beliefs, and that the mediating and moderating influence of IID in relation to discrimination did not depend on whether students attended a HBCU or a TWI. One reason why no significant interactions were detected is that prior studies indicate that tests of interactions, particularly when using surveys and correlational studies, almost always have significantly less power than tests of main effects (McClelland & Judd, 1993). Another possible explanation is that for this particular sample, students are generally more inclined to respond to perceptions of discrimination by embracing positive diversity beliefs.
and working harder to participate in academically engaging activities, irrespective of
students’ level of IID or whether they attend a HBCU or a TWI. Overall, further studies are
needed to investigate whether the same results hold for other samples of Black college
students, or if these results can simply be attributed to characteristics that are unique to Black
college students who enter law school.

**General Conclusions**

In the past decade, a growing number of studies have investigated the educational
benefits of informal interactional diversity (IID) on U.S. college students. While researchers
have found that IID is associated with students’ enhanced educational outcomes and
openness to diversity, there is currently a dearth of research that utilizes within-group designs
to investigate the measurement properties and the impact of IID on Black collegians. The
majority of research that examines the relationships between IID and students’ educational
and attitudinal outcomes also over utilizes predominantly White college samples and
implicitly works under the assumption that IID is conceptually similar across different racial
groups.

Overall, the fact that so few studies have evaluated the influence of IID on Blacks
(and other minorities) in college is somewhat alarming, given dramatic demographic shifts
and the rising proportion of Blacks, Asians, and Hispanic/Latinos who are predicted to make
up the racial/ethnic majority in the U.S. by the year 2030 (Pike & Kuh, 2006). Indeed, it is
important to foster high academic achievement and promote diversity among Blacks and
other minority college students, because this particular population is expected to make up the
next generation of academicians and professionals who will compete in an increasingly
multicultural and interconnected global economy. Another reason why it is surprising that so
few studies have assessed the impact of IID on Black college students is that affirmative action and diversity initiatives (e.g., multicultural education programs, federally funded programs created to increase the number of minorities in college, etc.) were originally created to rectify social and economic problems stemming from historical, longstanding discrimination against Blacks and other racial minorities.

To increase researcher’s and policymaker’s knowledge of the influence of IID on Black college students, two separate studies are conducted to examine the factor structure and measurement properties of IID, and the means with which IID operates in relation to perceptions of racial discrimination. Based on results from Study 1, it is evident that more research is needed to improve extant measures of IID, particularly among Black collegians. More specifically, results from Study 1 along with findings from Upton et al. (in preparation) suggest that items pertaining to the frequency with which college students discuss racial issues or attend racial and ethnic awareness workshops are conceptually meaningful for White college students, but not for their Black counterparts. Thus it is important that researchers develop standardized measures of IID that focus on both the frequency and quality of students’ interactions with diverse racial groups to better understand the ways that IID affects White and Black college students. Given that the measures in this study do not allow one to test whether Black undergraduates interact with Whites more frequently than other groups, an important point is that additional measures evaluating which specific racial or ethnic groups students choose to interact with could be useful in future studies, particularly when investigating the relationship between IID and perceptions of discrimination. Given findings from Study 1, future researchers should also be encouraged to
examine the factor structure of IID and other, related constructs, and to perform tests for ME/I prior to assessing the effects of IID across different racial, economic, or social groups.

Study 2 results also provide a number of implications for future research. First, findings from Study 2 indicate that IID is associated with enhanced academic engagement and positive diversity-related beliefs, even when accounting for Black collegian’s experiences and perceptions of racial discrimination. This finding is noteworthy, because it supports results from previous studies that utilize predominantly White college samples to evaluate the academic advantages of IID on Black college students, and it provides evidence to suggest that affirmative action and race sensitive college admissions are needed to increase Black students’ ability to benefit from interacting with individuals from diverse racial groups. Results from Study 2 further indicate that more research using longitudinal and experimental methods is needed to investigate the processes through which racial discrimination and IID affect this particular population of students, and whether IID truly serves to predict racial discrimination on Black college students’ educational and attitudinal outcomes. Additional studies are also needed to determine whether perceptions of racial discrimination are associated with increased academic engagement and positive beliefs regarding the educational benefits of diversity through IID, or if these results are unique to the particular sample of high-achieving, academically successful Black college students examined.
### Table 2.1

**Correlations and Descriptive Statistics: EDP Volunteer Sample (N = 143)**

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<tbody>
<tr>
<td>1. Discuss racial issues</td>
<td>4</td>
<td>1.15</td>
<td>1</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Have close friends</td>
<td>4</td>
<td>1.36</td>
<td>.05</td>
<td>1</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Date someone</td>
<td>2</td>
<td>1.57</td>
<td>.01</td>
<td>.51**</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Study with someone</td>
<td>4</td>
<td>1.42</td>
<td>.04</td>
<td>.72**</td>
<td>.45**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Cultural awareness programs</td>
<td>3</td>
<td>1.44</td>
<td>.55**</td>
<td>.08</td>
<td>-.09</td>
<td>.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Had serious conversations</td>
<td>3</td>
<td>.96</td>
<td>.37**</td>
<td>.33**</td>
<td>.19*</td>
<td>.26**</td>
<td>.20*</td>
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</table>

*Note.* *p* < .05. **p** < .01.

### Table 2.2

**Correlations and Descriptive Statistics: EDP Core Sample (N = 589)**

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<thead>
<tr>
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<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
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<td>1. Discuss racial issues</td>
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<td>2. Have close friends</td>
<td>3</td>
<td>1.30</td>
<td>.01</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Date someone</td>
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<td>1.30</td>
<td>-.17**</td>
<td>.45**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Study with someone</td>
<td>3</td>
<td>1.39</td>
<td>-.04</td>
<td>.73**</td>
<td>.40**</td>
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<td></td>
<td></td>
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<tr>
<td>5. Cultural awareness programs</td>
<td>3</td>
<td>1.39</td>
<td>.50**</td>
<td>.06</td>
<td>-.08</td>
<td>.12**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Had serious conversations</td>
<td>3</td>
<td>1.00</td>
<td>.36**</td>
<td>.26**</td>
<td>.12*</td>
<td>.23**</td>
<td>.33**</td>
<td>1</td>
</tr>
</tbody>
</table>

*Note.* *p* < .05. **p** < .01.
### Table 2.3

**Demographics of Black Students in Volunteer and EDP Core Samples**

<table>
<thead>
<tr>
<th>Item</th>
<th>Volunteer Sample</th>
<th>EDP Core Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>59.44</td>
<td>68.25</td>
</tr>
<tr>
<td>IID Reports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discuss Racial Issues</td>
<td>54.54</td>
<td>68.25</td>
</tr>
<tr>
<td>Have Close Friends</td>
<td>60.84</td>
<td>49.06</td>
</tr>
<tr>
<td>Date Someone</td>
<td>30.28</td>
<td>14.58</td>
</tr>
<tr>
<td>Study with Someone</td>
<td>59.15</td>
<td>46.24</td>
</tr>
<tr>
<td>Cultural Awareness Programs</td>
<td>44.06</td>
<td>41.98</td>
</tr>
<tr>
<td>Had Serious Conversations</td>
<td>53.96</td>
<td>51.42</td>
</tr>
</tbody>
</table>

*Note. IID reports include the proportion of students who stated that they engaged in diversity-related activities “often” or “very often.”*
Table 2.4

**Demographic Characteristics for Racial Groups in the EDP Core Sample**

<table>
<thead>
<tr>
<th>Item</th>
<th>Black</th>
<th>White</th>
<th>Asian</th>
<th>Hispanic/Latino</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>68.25</td>
<td>48.88</td>
<td>56.89</td>
<td>51.09</td>
</tr>
<tr>
<td><strong>Household Income</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below $10,000</td>
<td>4.16</td>
<td>1.38</td>
<td>2.93</td>
<td>3.21</td>
</tr>
<tr>
<td>$10,000 to $49,000</td>
<td>40.83</td>
<td>21.71</td>
<td>31.15</td>
<td>42.95</td>
</tr>
<tr>
<td>$50,000 or more</td>
<td>55.01</td>
<td>76.91</td>
<td>65.92</td>
<td>53.84</td>
</tr>
<tr>
<td><strong>IID Reports</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Discuss Racial Issues</td>
<td>62.15</td>
<td>31.12</td>
<td>34.27</td>
<td>33.71</td>
</tr>
<tr>
<td>Have Close Friends</td>
<td>49.06</td>
<td>40.70</td>
<td>70.88</td>
<td>71.91</td>
</tr>
<tr>
<td>Date Someone</td>
<td>14.58</td>
<td>11.56</td>
<td>46.67</td>
<td>43.50</td>
</tr>
<tr>
<td>Study With Someone</td>
<td>46.24</td>
<td>38.44</td>
<td>75.30</td>
<td>66.29</td>
</tr>
<tr>
<td>Cultural Awareness Programs</td>
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<td>11.91</td>
<td>24.05</td>
<td>22.47</td>
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<tr>
<td>Had Serious Conversations</td>
<td>51.42</td>
<td>50.87</td>
<td>38.76</td>
<td>49.13</td>
</tr>
</tbody>
</table>

*Note.* *p*<.05. **p**<.01. Results for IID items showed the percentage of students from each racial group who reported that they engaged in activities often/very often. Chi-square tests revealed that gender, along with the endorsement patterns for political orientation, household income, and the six IID items significantly differ across the four racial groups.

Table 2.5

**ML EFA Results from the Volunteer Sample (N=143)**

<table>
<thead>
<tr>
<th>Study Variable</th>
<th>Factor Loading</th>
<th>Standard Error</th>
<th>Item Communality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Study with Someone</td>
<td>.86</td>
<td>.05</td>
<td>.74</td>
</tr>
<tr>
<td>2. Date Someone</td>
<td>.68</td>
<td>.08</td>
<td>.46</td>
</tr>
<tr>
<td>3. Have Close Friends</td>
<td>.94</td>
<td>.03</td>
<td>.88</td>
</tr>
<tr>
<td>4. Had Serious Conversations</td>
<td>.34</td>
<td>.09</td>
<td>.12</td>
</tr>
</tbody>
</table>
Table 2.6

Correlations and IID Factor Scores Using the Volunteer Sample

<table>
<thead>
<tr>
<th>Study Variable</th>
<th>IID Total Score (Factor Score)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Study with Someone</td>
<td>.84**</td>
</tr>
<tr>
<td>2. Date Someone</td>
<td>.67**</td>
</tr>
<tr>
<td>3. Have Close Friends</td>
<td>.94**</td>
</tr>
<tr>
<td>4. Had Serious Conversations</td>
<td>.35**</td>
</tr>
</tbody>
</table>

Note. *p<.05. **p<.01.
Table 2.7

*Single-Level CFA Model Using the EDP Core Sample (N = 589) and MLR Estimation*

<table>
<thead>
<tr>
<th>Study 1</th>
<th>Factor Loading</th>
<th>Standard Error (SE)</th>
<th>Communality (SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study with Someone</td>
<td>1.00</td>
<td>--</td>
<td>.77 (.03)**</td>
</tr>
<tr>
<td>Date Someone</td>
<td>.22**</td>
<td>.06</td>
<td>.24 (.07)**</td>
</tr>
<tr>
<td>Have Close Friends</td>
<td>.71**</td>
<td>.16</td>
<td>.87 (.05)**</td>
</tr>
<tr>
<td>Had Serious Conversations</td>
<td>.15**</td>
<td>.05</td>
<td>.13 (.06)*</td>
</tr>
<tr>
<td><strong>Thresholds</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study 1</td>
<td></td>
<td>-5.04</td>
<td></td>
</tr>
<tr>
<td>Study 2</td>
<td></td>
<td>-2.79</td>
<td></td>
</tr>
<tr>
<td>Study 3</td>
<td></td>
<td>-.05</td>
<td></td>
</tr>
<tr>
<td>Study 4</td>
<td></td>
<td>2.35</td>
<td></td>
</tr>
<tr>
<td>Date 1</td>
<td></td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>Date 2</td>
<td></td>
<td>1.06</td>
<td></td>
</tr>
<tr>
<td>Date 3</td>
<td></td>
<td>1.75</td>
<td></td>
</tr>
<tr>
<td>Date 4</td>
<td></td>
<td>2.27</td>
<td></td>
</tr>
<tr>
<td>Close Friends 1</td>
<td></td>
<td>-5.12</td>
<td></td>
</tr>
</tbody>
</table>
Table 2.7 (Continued)

*Single-Level CFA Model Using the EDP Core Sample (N = 589) and MLR Estimation*

<table>
<thead>
<tr>
<th>Thresholds</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Close Friends 2</td>
<td>-2.14</td>
</tr>
<tr>
<td>Close Friends 3</td>
<td>-.27</td>
</tr>
<tr>
<td>Close Friends 4</td>
<td>1.68</td>
</tr>
<tr>
<td>Conversations 1</td>
<td>-1.84</td>
</tr>
<tr>
<td>Conversations 2</td>
<td>-.05</td>
</tr>
<tr>
<td>Conversations 3</td>
<td>1.36</td>
</tr>
</tbody>
</table>

*Note.* *p*.05. **p*.01. The variance for the IID factor was estimated at 8.15 with a standard error of 1.69.
Table 2.8

Variance Components Measurement Model Using EDP Core Sample (N = 589) and MLR Estimation

<table>
<thead>
<tr>
<th>Study 1</th>
<th>Factor Loading</th>
<th>Standard Error (SE)</th>
<th>Level-1 Communality (SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study with Someone</td>
<td>1.00</td>
<td>--</td>
<td>.77 (.03)**</td>
</tr>
<tr>
<td>Date Someone</td>
<td>.35**</td>
<td>.07</td>
<td>.24 (.07)**</td>
</tr>
<tr>
<td>Have Close Friends</td>
<td>.90**</td>
<td>.16</td>
<td>.87 (.05)**</td>
</tr>
<tr>
<td>Had Serious Conversations</td>
<td>.17**</td>
<td>.04</td>
<td>.13 (.06)*</td>
</tr>
</tbody>
</table>

Thresholds

| Study 1 | -4.34 |
| Study 2 | -1.82 |
| Study 3 | .17 |
| Study 4 | 2.35 |
| Date 1 | .21 |
| Date 2 | 1.25 |
| Date 3 | 2.08 |
| Date 4 | 2.81 |
| Close Friends 1 | -5.00 |
Table 2.8 (Continued)

Variance Components Measurement Model Using EDP Core Sample (N = 589) and MLR Estimation

<table>
<thead>
<tr>
<th>Thresholds</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Close Friends 2</td>
<td>-1.94</td>
</tr>
<tr>
<td>Close Friends 3</td>
<td>-0.27</td>
</tr>
<tr>
<td>Close Friends 4</td>
<td>1.68</td>
</tr>
<tr>
<td>Conversations 1</td>
<td>-1.84</td>
</tr>
<tr>
<td>Conversations 2</td>
<td>-0.05</td>
</tr>
<tr>
<td>Conversations 3</td>
<td>1.36</td>
</tr>
</tbody>
</table>

Note. *p<.05. **p<.01. The variance for the IID factor at the student-level (level-1) was 10.87 with a standard error of 2.93. The variance for the IID factor at the school-level (level-2) was non-significant at an alpha level of .05 and was estimated at 1.36 with a standard error of .85.
Table 2.9

*Results from Partially Invariant Multiple Group Multilevel Model Using MLR Estimation*

<table>
<thead>
<tr>
<th>Study 1</th>
<th>Study with Someone</th>
<th>1.00</th>
<th>Study with Someone</th>
<th>1.00</th>
<th>Study with Someone</th>
<th>1.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date Someone</td>
<td>.32**</td>
<td>.07</td>
<td>Date Someone</td>
<td>.32**</td>
<td>Date Someone</td>
<td>.07</td>
</tr>
<tr>
<td>Have Close Friends</td>
<td>.93**</td>
<td>.16</td>
<td>Have Close Friends</td>
<td>.93**</td>
<td>Have Close Friends</td>
<td>.16</td>
</tr>
<tr>
<td>Had Serious Conversations</td>
<td>.17**</td>
<td>.04</td>
<td>Had Serious Conversations</td>
<td>.17**</td>
<td>Had Serious Conversations</td>
<td>.04</td>
</tr>
<tr>
<td>Thresholds</td>
<td>HBCU</td>
<td></td>
<td>TWI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study 1</td>
<td>-3.87</td>
<td>-4.15</td>
<td>Study 2</td>
<td>-1.01</td>
<td>Study 2</td>
<td>-1.69</td>
</tr>
<tr>
<td>Study 3</td>
<td>.97</td>
<td>.28</td>
<td>Study 3</td>
<td>.97</td>
<td>Study 3</td>
<td>.28</td>
</tr>
<tr>
<td>Study 4</td>
<td>2.53</td>
<td>2.46</td>
<td>Study 4</td>
<td>2.53</td>
<td>Study 4</td>
<td>2.46</td>
</tr>
<tr>
<td>Date 1</td>
<td>.11</td>
<td>.28</td>
<td>Date 1</td>
<td>.11</td>
<td>Date 1</td>
<td>.28</td>
</tr>
<tr>
<td>Date 2</td>
<td>1.30</td>
<td>--</td>
<td>Date 2</td>
<td>1.30</td>
<td>Date 2</td>
<td>--</td>
</tr>
<tr>
<td>Date 3</td>
<td>2.40</td>
<td>2.06</td>
<td>Date 3</td>
<td>2.40</td>
<td>Date 3</td>
<td>2.06</td>
</tr>
<tr>
<td>Date 4</td>
<td>2.86</td>
<td>2.95</td>
<td>Date 4</td>
<td>2.86</td>
<td>Date 4</td>
<td>2.95</td>
</tr>
<tr>
<td>Close Friends 1</td>
<td>-5.01</td>
<td>--</td>
<td>Close Friends 1</td>
<td>-5.01</td>
<td>Close Friends 1</td>
<td>--</td>
</tr>
</tbody>
</table>
Table 2.9 (Continued)

*Results from Partially Invariant Multiple Group Multilevel Model Using MLR Estimation*

<table>
<thead>
<tr>
<th>Thresholds</th>
<th>HBCU</th>
<th>TWI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Close Friends 2</td>
<td>-1.86</td>
<td>--</td>
</tr>
<tr>
<td>Close Friends 3</td>
<td>.04</td>
<td>--</td>
</tr>
<tr>
<td>Close Friends 4</td>
<td>2.15</td>
<td>--</td>
</tr>
<tr>
<td>Conversations 1</td>
<td>-1.96</td>
<td>--</td>
</tr>
<tr>
<td>Conversations 2</td>
<td>-.11</td>
<td>--</td>
</tr>
<tr>
<td>Conversations 3</td>
<td>1.14</td>
<td>--</td>
</tr>
</tbody>
</table>

*Note.* *p*<.05. **p**<.01. The symbol **“--”** denotes thresholds that are equal across HBCUs and TWIs. The variance for the IID factor at the student-level was constrained to be equal across HBCUs and TWIs and was estimated at 10.87 with a standard error of 3.01. The between-level variance for TWIs and HBCUs was also constrained to be equal and was estimated at .81 with a standard error of .78.
Table 3.1

Correlations and Descriptive Statistics of Revised IID Scale and Other Variables (N = 589)

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>IID</td>
<td>2.89</td>
<td>.31</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Perceptions of discrimination</td>
<td>.80</td>
<td>.68</td>
<td>.17*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Unfair treatment</td>
<td>2.70</td>
<td>1.49</td>
<td>.04</td>
<td>.28**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>HBCU</td>
<td>.33</td>
<td>.47</td>
<td>-.02</td>
<td>-.08*</td>
<td>-.06</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Gender</td>
<td>.68</td>
<td>.47</td>
<td>-.03</td>
<td>.02</td>
<td>-.03</td>
<td>.08</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Age</td>
<td>25.45</td>
<td>5.12</td>
<td>.12*</td>
<td>.09*</td>
<td>-.03</td>
<td>.01</td>
<td>-.07</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Household income</td>
<td>2.88</td>
<td>1.22</td>
<td>.01</td>
<td>-.04</td>
<td>.01</td>
<td>-.01</td>
<td>-.01</td>
<td>.16**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Marital Status</td>
<td>.85</td>
<td>.36</td>
<td>-.13*</td>
<td>-.06</td>
<td>-.05</td>
<td>.01</td>
<td>-.01</td>
<td>.45**</td>
<td>.15**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Highest level of education</td>
<td>.13</td>
<td>.34</td>
<td>.08</td>
<td>.04</td>
<td>-.04</td>
<td>-.08</td>
<td>-.08</td>
<td>.41*</td>
<td></td>
<td>-.09</td>
<td>.10*</td>
<td>1</td>
</tr>
<tr>
<td>10.</td>
<td>Diversity beliefs</td>
<td>4.33</td>
<td>2.17</td>
<td>.22**</td>
<td>.10*</td>
<td>.09</td>
<td>.08</td>
<td>-.02</td>
<td>.04</td>
<td>.02</td>
<td>-.07</td>
<td>.05</td>
<td>1</td>
</tr>
<tr>
<td>11.</td>
<td>Academic engagement</td>
<td>2.66</td>
<td>.65</td>
<td>.10*</td>
<td>.05</td>
<td>.10*</td>
<td>.06</td>
<td>-.03</td>
<td>-.12**</td>
<td>.02</td>
<td>-.03</td>
<td>-.05</td>
<td>.24**</td>
</tr>
</tbody>
</table>

Note. *p < .05. **p < .01.
Table 3.2

Demographics Characteristics of Black Students Across HBCUs and TWIs

<table>
<thead>
<tr>
<th>Item</th>
<th>HBCU</th>
<th>TWI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>73.85</td>
<td>65.21</td>
</tr>
<tr>
<td>Achieved a Bachelor’s Degree</td>
<td>11.86</td>
<td>13.99</td>
</tr>
<tr>
<td>Experienced Racial Discrimination</td>
<td>58.97</td>
<td>67.53</td>
</tr>
<tr>
<td>Married</td>
<td>84.46</td>
<td>84.28</td>
</tr>
</tbody>
</table>

*Note.* Chi-square tests revealed that all of demographic characteristics significantly differed across HBCUs and TWIs, except for students’ highest level of education and marital status.
<table>
<thead>
<tr>
<th>Predictor</th>
<th>Regression Coefficient</th>
<th>Standard Error (SE)</th>
<th>Regression Coefficient</th>
<th>Standard Error (SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diversity Beliefs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IID</td>
<td>.12*</td>
<td>.05</td>
<td>.12*</td>
<td>.06</td>
</tr>
<tr>
<td>Perceptions of discrimination</td>
<td>.59</td>
<td>.48</td>
<td>.27</td>
<td>.28</td>
</tr>
<tr>
<td>HBCU</td>
<td>.31</td>
<td>.32</td>
<td>.35</td>
<td>.36</td>
</tr>
<tr>
<td>Gender</td>
<td>.36</td>
<td>.39</td>
<td>-.22</td>
<td>.43</td>
</tr>
<tr>
<td>Age</td>
<td>-.06</td>
<td>.04</td>
<td>-.15**</td>
<td>.05</td>
</tr>
<tr>
<td>Household income</td>
<td>-.04</td>
<td>.12</td>
<td>.27</td>
<td>.17</td>
</tr>
<tr>
<td>Marital Status</td>
<td>-.13</td>
<td>.45</td>
<td>-.17**</td>
<td>.06</td>
</tr>
<tr>
<td>Highest level of education</td>
<td>.55</td>
<td>.50</td>
<td>-.56</td>
<td>.55</td>
</tr>
<tr>
<td>Academic Engagement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Study Outcome</th>
<th>R-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diversity Beliefs</td>
<td>.05*</td>
</tr>
<tr>
<td>Academic Engagement</td>
<td>.10**</td>
</tr>
</tbody>
</table>

*Note. *p < .05; **p < .01.
Table 3.4  

Results for Model 2: Unstandardized regression coefficients, standard errors, and R-Square

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Diversity Beliefs</th>
<th>Academic Engagement</th>
<th>Diversity Beliefs</th>
<th>Academic Engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>IID</td>
<td>.13*</td>
<td>.04</td>
<td>.13*</td>
<td>.06</td>
</tr>
<tr>
<td>Unfair treatment</td>
<td>-.02</td>
<td>.04</td>
<td>.05*</td>
<td>.02</td>
</tr>
<tr>
<td>HBCU</td>
<td>.24</td>
<td>.31</td>
<td>.46</td>
<td>.35</td>
</tr>
<tr>
<td>Gender</td>
<td>.41</td>
<td>.39</td>
<td>-.16</td>
<td>.42</td>
</tr>
<tr>
<td>Age</td>
<td>-.05</td>
<td>.04</td>
<td>-.15**</td>
<td>.05</td>
</tr>
<tr>
<td>Household income</td>
<td>-.03</td>
<td>.11</td>
<td>.27</td>
<td>.17</td>
</tr>
<tr>
<td>Marital Status</td>
<td>-.03</td>
<td>.04</td>
<td>-.19**</td>
<td>.06</td>
</tr>
<tr>
<td>Highest level of education</td>
<td>.55</td>
<td>.49</td>
<td>-.43</td>
<td>.52</td>
</tr>
</tbody>
</table>

Study Outcome

<table>
<thead>
<tr>
<th>R-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diversity Beliefs</td>
</tr>
<tr>
<td>Academic Engagement</td>
</tr>
</tbody>
</table>

Note. * p < .05; ** p < .01.
IID

- Have Close Friends
- Study
- Date
- Conversations with Individuals Who Are Different
Between Study Have Close Friends Date Conversations With Individuals Who Are Different

IID Between

IID Within

\[ \begin{align*}
\epsilon_{B1} & \quad \lambda_{B2} \\
\epsilon_{B2} & \quad \lambda_{B3} \\
\epsilon_{B3} & \quad \lambda_{B4} \\
\epsilon_{B4} & \\
\end{align*} \]

\[ \begin{align*}
\epsilon_{W1} & \quad \lambda_{W2} \\
\epsilon_{W2} & \quad \lambda_{W3} \\
\epsilon_{W3} & \quad \lambda_{W4} \\
\epsilon_{W4} & \\
\end{align*} \]
School-Level

Student-Level

IID Within

IID Between

1 \lambda_2 \lambda_3 \lambda_4

\varepsilon_{W1} \varepsilon_{W2} \varepsilon_{W3} \varepsilon_{W4}

Have Close Friends Study Date Conversations With Individuals Who Are Different

Student-Level

Have Close Friends

Study

Date

Conversations With Individuals Who Are Different
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