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Examining multiracial youth in context: ethnic identity development and mental health outcomes

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Abstract

Although multiracial individuals are the fastest growing population in the United States, research on the identity development of multiracial adolescents remains scant. This study explores the relationship between ethnic identity, its components (affirmation, exploration), and mental health outcomes (anxiety, depression) within the contexts of schools for multiracial adolescents. Participants were multiracial and monoracial minority and majority high school students (n=4,766). Using Analysis of Variance and Multiple Indicators Multiple Causes (MIMIC) models, results indicated that multiracial youth experience more exploration and less affirmation than African Americans, but more than Caucasians. In addition, multiracial youth were found to have higher levels of mental health issues than their monoracial minority and majority peers. Specifically, multiracial youth had higher levels of depression than their African American and Caucasian counterparts. Multiracial and Caucasian youth had similar levels of anxiety but these levels were significantly higher than African Americans. Results also show that school diversity can mitigate mental health outcomes finding that multiracial youth in more diverse schools are at lower risk for mental health issues.

Keywords: Ethnic Identity, Multiracial adolescents, Anxiety, Depression

Examining Multiracial Youth in Context: Ethnic Identity Development and Mental Health Outcomes

In the 1967 federal court case of *Loving v. Virginia*, the Supreme Court voted to end all race-based restrictions on interracial marriage (Wardle, 1997). The number of interracial marriages and resulting offspring nearly doubled between the 1960 and 1970 Census (U.S. Census Bureau, 1994) and introduced a larger population of multiracial individuals into a society with a history of categorizing individuals based on their race (Shih & Sanchez, 2005). Historically, the one-drop rule of racial classification (hypodescent) led society and early researchers to classify multiracial individuals as minorities (Fernandez, 1996; Root, 1992). In 2000, the U.S. Census Bureau allowed individuals with multiple ethnicities to select multiple races instead of only one. According to the 2010 U.S. Census (U.S. Census Bureau, 2012), the number of people who reported being multiracial grew more than any other single race since 2000, up 32% to nine million. This trend of identifying individuals with mixed-race backgrounds as multiracial, instead of placing them within monoracial categories, has increased steadily in the last decade (Rockquemore, Brunsma, & Delgado, 2009).

School Diversity

Although progress has been made in the acknowledgement of multiracial individuals, they remain a minority group in the U.S. As a minority group, multiracial individuals can experience stigmatization from the larger society in the form of racial micro aggressions (Way, Santos, Niwa, & Kim-Gervy, 2008). Racial micro aggressions among monoracial minorities are associated with the development of mental health issues such as depression, anxiety, and low self-esteem (Huynh, Devos, & Dunbar, 2012; Jones, Cross, & Defour, 2007; Pascoe & Smart Richman, 2009). For adolescents, the school context has a powerful influence on mental health

issues. Social contexts can inform how multiracial individuals choose to identify and in turn influence psychological adjustment (Pinderhughes, 1995). Research with multiracial adolescents exploring the relationship between school context and mental health issues is limited and conflicting (Brittian, Umana-Taylor, & Derlan, 2013; Brown, 2001). Mixed results and a dearth of research on the impact of the school context on the psychological outcomes of multiracial youth make it imperative to investigate this relationship further.

Ethnic identity development serves as a protective factor against the negative psychological outcomes that social contexts can contribute to (Jones, et al., 2007; Sellers, Caldwell, Schmeelk-Cone, & Zimmerman, 2003). A plethora of research has investigated the impact of racial categorization on the ethnic identity development and mental health outcomes of monoracial individuals (e.g., Kiang, Yip, Gonzales-Backen, Witkow & Fuligni, 2006; Phinney, Cantu & Kurtz, 1997; Sellers, Copeland-Linder, Martin, & Lewis, 2006). However, the research on multiracial individuals, identity development, and mental health outcomes is limited. The multiracial population, although growing in number, is largely missing from the landscape of psychological research. Further investigation is needed on the ethnic identity development and mental health outcomes of multiracial adolescents, as traditional research on monoracial youth may not apply to youth with multiple ethnic or racial identities. The purpose of this study is to investigate the impact of the school context and compare the ethnic identity development and subsequent mental health outcomes of multiracial adolescents to their monoracial peers.

Ethnic Identity Development

Most authors agree that ethnic identity development is dynamic, and emerges during adolescence (Phinney, 1990; Quintana et al., 2006; Yip, Seaton, & Sellers, 2006). Ethnic identity formation takes place over time, as ethnic group members explore and make decisions

about the role ethnicity plays in their lives. Various theoretical frameworks have been used to describe the formation of an ethnic identity (Umaña-Taylor, Yazedjian, & Bamaca-Gomez, 2004; Yip et al., 2006). This study will use social identity theory to understand the ethnic identity development of multiracial adolescents.

Social identity theory (Tajfel, 1974) posits that people are grouped based on meaningful similarities. Acceptance of, and into, these social groupings facilitates positive identity development (Tajfel & Turner, 1986). According to social identity theory, those that identify as multiracial would have to negotiate social groupings thrust upon them and come to their own understanding of what group(s) they identify with to develop a strong ethnic identity.

Early research on multiracial individuals, took a problem approach to their identity development and subsequent psychological outcomes (Shih & Sanchez, 2005). Terms such as “marginal man” were used to describe multiracial individuals who did not fit into one specific racial group and thus, were on the margins of multiple groups (Rockquemore et al., 2009; Shih & Sanchez, 2005; Stonequist, 1937). In recent years, interest in the identity development of multiracial individuals has increased with the population (Renn, 2008). However, the research on the identity development of multiracial adolescents still remains scant (Renn, 2008; Rockquemore et al., 2009).

Limited research on the identity development of multiracial individuals has found that their ethnic identity development, as measured by the Multigroup Ethnic Identity Measure (MEIM), is not as strong as monoracial ethnic minority groups (e.g., African Americans) but stronger than monoracial majority groups (e.g., Caucasians; Bracey et al., 2004, Phinney, 1992). This discrepancy indicates that multiracial identity development differs from that of their monoracial peers. Although researchers have identified the differences in ethnic identity

development between monoracial and multiracial adolescents, few have investigated the components of ethnic identity (i.e., exploration and affirmation) to ascertain how the individual aspects of identity development compare to monoracial peers.

A variety of experiences can initiate exploration, or investigating one's ethnicity. Family members that communicate with children about their ethnic background encourage exploration of that background (Brittain et al., 2013). Exploration may also take place because of some experience that has forced an individual to become more aware of their membership to a group. This exploration more often occurs when one's ethnic background differs from the majority culture, and among ethnic groups with lower status and power (Phinney, 1989). Over time, as individuals explore, they make decisions about the role ethnicity will play in their lives. This exploration facilitates the development of an understanding, or affirmation, of what it means to be a member of that ethnic group (Umaña-Taylor, Alfaro, Bamaca, & Guimond, 2009). This affirmation may result in a positive sense of belonging to one's ethnic group, or a strong ethnic identity (or high levels of affirmation). Although for some, their ethnicity may still not be central to their lives and overall identity (Phinney, 1989, 1997).

Further investigation into the ethnic identity of multiracial youth is needed. Limited results indicate that multiracial youth have higher levels of ethnic identity than monoracial Caucasians, lower levels than monoracial minority adolescents, and may experience more confusion and less commitment to their ethnicity than other groups (Bracey et al., 2004). Bracey and Colleagues (2004) suggest future research should investigate the variation of exploration and affirmation of multiracial youth ethnic identity development. This study seeks to answer this call by comparing these ethnic identity components among multiracial and monoracial adolescents.

Ethnic Identity and Mental Health Outcomes

Research on the relationship between ethnic identity and psychological adjustment for monoracial adolescents is robust (see Kiang et al., 2006; Phinney, 1990; Pyant & Yanico, 1991; Umana-Taylor, Diversi & Fine, 2002; Sellers et al., 2006). When looking at monoracial minority groups, there is a documented negative relationship between the strength of an individual's ethnic identity and measures of depression. College-aged individuals with low levels of ethnic identity affirmation demonstrate higher levels of depressive symptoms than college-aged individuals with higher levels of ethnic identity affirmation (Yip et al., 2006). Finally, a negative relationship was found between ethnic identity development and feelings of loneliness and depression for adolescents from monoracial majority and minority groups (Roberts et al., 1999).

Research on the relationship between ethnic identity and mental health issues for multiracial individuals is sparse. Researchers speculate, and some findings support, that the complex nature of identity development for multiracial youth will contribute to weaker identity development and thus more issues with psychological adjustment (Brown, 1990; Coleman & Carter, 2007; Lusk, Taylor, Nanney, & Austin, 2010; Milan & Keiley, 2000; Park, 1928; Stonequist, 1961; Teicher, 1968; Udry, Li, & Hendrickson-Smith, 2003; Williams & Thornton, 1998). Others oppose the notion that multiple identities may lead to poor psychological outcomes, stating that one cannot assume that having two or more identities would lead to difficulties in identity development (Kato, 2000). Research supports this assertion with studies finding a positive relationship between multiracial ethnic identity and psychological well-being (Bracey et al., 2004; Binning, Unzueta, Huo, & Molina, 2009; Lusk, et al., 2010). When comparing different groups' findings suggest that multiracial adolescents had significantly higher levels of self-esteem than Asians, but significantly lower levels than African Americans.

Others find that multiracial identity development is not as straight forward as other researchers have assumed. On a more nuanced level, researchers have found that the way in which individuals with multiple ethnicities categorize themselves also has some bearing on psychological outcomes. For example, multiracial individuals who identify as multiracial as opposed to monoracial have been found to have better psychological outcomes (Gillem, Cohn, & Throne, 2001). Additionally, multiracial individuals have been found to differ in levels of depression based on the way that their multiracial identity is developed. Those who identify as multiracial at least some of the time had lower levels of depression than those who do not acknowledge their multiracial identity (i.e., incorporation of both component races; Lusk et al., 2010). Overall, the research in this area is varied and conflicting. Additional research is needed to clarify the experiences of multiracial youth.

Current Study and Hypotheses

The purpose of this study was to explore the relationship between ethnic identity, its components, and mental health outcomes within the contexts of schools for multiracial adolescents. Our first hypothesis was that multiracial adolescents would have higher levels of exploration and affirmation than Caucasians (majority monoracial), but lower levels than African Americans (minority monoracial) adolescents. With regard to differences in mental health outcomes, no hypotheses were developed based on the contradictory literature in this area. Thus, our second research question was whether multiracial adolescents differ from monoracial peers in anxiety and depression. Third, based on previous research, we hypothesized that both ethnic identity exploration and affirmation would be significantly related to mental health outcomes for all racial groups. Furthermore, we expected that ethnic identity exploration would be negatively related to mental health outcomes while ethnic identity affirmation would be positively related to

mental health outcomes. To our best knowledge this is the first paper to look at mental health as a latent variable among multiracial youth. Lastly, we investigated the differential impact of school diversity on mental health outcomes of multiracial and monoracial adolescents.

Method

Participants

Participants were 4,766 high school students in grades nine through twelve, with an average age of 16.1 years ($SD = 1.13$). The data consisted of more female (54.6%) than male (45.4%) participants. Among the participants, 88.1% were Caucasian, 7.4% were African American, and 4.5% were multiracial. Descriptive data and scores on the MEIM components (exploration and affirmation), school diversity (Simpson Index), and mental health (anxiety and depression), are presented in Table 1.

[INSERT TABLE 1]

Procedures

Data were retrieved from data collected as a part of a larger research study. A research team from a large Midwestern university and a large Midwestern county convened to create a survey instrument called the Coordinated Community Student Survey (C²S²). The team collected data from 4th through 12th grade students in the spring of each year using both paper surveys and Internet-based surveys, depending upon each school's testing capacity. This study uses data from the 9th-12th grade students administered the survey in year 3 (2008) of the study. Approximately 50% of enrolled students provided written parental consent to participate in the study (approximately 12,000 students per year). Research staff administered surveys at each participating school during school hours to all students whose parents provided written consent.

Data for individuals were de-identified and included the original items and scale scores relevant to this project.

Measures

Coordinated Community Student Survey (C²S²). The C²S² is an instrument designed to assess self-reported student's attitudes, beliefs, and behaviors. The C²S² is a 208-item questionnaire that assesses student physical, social, and psychological functioning using reliable and valid multi-item scales selected from public and peer-reviewed sources. Data from three constructs were used for this study: MEIM, anxiety, and depression.

MEIM. The MEIM (Roberts et al., 1999) is a 12-item scale that was designed to measure two components of ethnic identity: exploration and affirmation. This is a revised version of Phinney's (1992) original 14-item version. Items on the subscales used in the current study are rated on a 4-point Likert scale, with a score of 1 being strongly disagree and a score of 4 being strongly agree.

Ethnic identity exploration. The exploration subscale score on the MEIM (Roberts et al., 1999) was used to define ethnic identity exploration. It is a 6-item subscale that was designed to measure an individual's exploration or confusion about their ethnicity. The ethnic identity exploration subscale has an established reliability of .62, .67, and .70 with African American, Caucasian, and Mixed Race individuals, respectively. The reliabilities of this scale with the current study's sample are .82, .76, and .82 with African American, Caucasian, and Mixed Race individuals, respectively.

Ethnic identity affirmation. The affirmation subscale score on the MEIM (Roberts et al., 1999) was used to define ethnic identity affirmation. It is a 7-item subscale that was designed to measure an individual's commitment to their ethnicity. The ethnic identity

affirmation subscale has an established reliability of .83, .84, and .85 with African American, Mixed Ancestry, and Caucasian individuals, respectively (Roberts et. al., 1999). The reliabilities of this scale with the current study's sample are .91, .91, and .88 with African American, Mixed Ancestry, and Caucasian individuals, respectively

Mental Health. Measures of anxiety and depression were used to create a latent variable of mental health. Anxiety was defined as “constant worries about family, friends, school, or activities” (American Academy of Child and Adolescent Psychiatry, 2004). This scale is a modified version of the State-Trait Anxiety Inventory (STAI). Items were rated on a 4-point likert scale, with a score of 1 being strongly disagree, and 4 being strongly agree. Items on the anxiety scale have a reliability of .92 with the current sample. Depression was defined as, “feeling blue or sad” (National Institute of Mental Health, 2008), and quantified using the total score from 13 items on the depression subscale of the C²S² ($M=2.1, SD=.64$). These items were rated on a 4 point likert scale, with a score of 1 being strongly disagree and 4 being strongly agree. This subscale has a reliability of .85 with the current sample.

School diversity. The racial diversity of each school was obtained with archival data from the National Center for Educational Statistics Common Core of Data. Employing Simpson's Index (Simpson, 1949) outlined in Juvonen, Nishina, and Graham (2006), and Yip and colleagues (2010), the racial diversity of each school was computed based on the percentage of students from each ethnic group. Using information about the number of different racial/ethnic groups (g) and the proportion of individuals (p) who are members of each group (i), the index (D_c) provides the relative probability that two randomly selected students are from different racial/ethnic groups ($D_c = 1 - \sum_{i=1}^g p_i^2$). Scores range from 0 to 1 ($M = .19, SD = .13$)

with higher scores indicating more diversity (i.e. predominately minority groups), where lower numbers indicate less diversity (i.e. predominately Caucasian).

Data Analyses

To answer the first question, an Analysis of Variance (ANOVA) was conducted. To test our second and third hypotheses, a Multiple Indicators Multiple Causes (MIMIC) model was adapted (Jöreskog and Glodberger, 1975; Muthén, 1989). This model assumes that observed variables (i.e., anxiety and depression) can predict the latent variables (mental health issues), which also associate with several indicators (i.e., ethnic identity, gender, ethnicity, and diversity). In this study, mental health issues are treated as a latent variable, which can be predicted by gender, race, multigroup ethnic identity measures (MEIM), and school diversity. Anxiety and depression are treated as the indicators of mental health. This model is applied separately to provide two different models, one with multiracial and Caucasian adolescents and the second with multiracial and African American adolescents.

Since a MIMIC model is a special application of Structural Equation Modeling (SEM), the statistical indices used for evaluating the SEM model can also be used to evaluate the MIMIC model, such as chi-square test, Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA) and Goodness-of-Fit Index (GFI). Higher values of CFI and GFI indicate a better model fit, as well as lower values for chi-square and RMSEA (Bentler, 1989, 1990; Jöreskog & Sörbom, 1986; Steiger & Lind, 1980). Typically, a good model fit is indicated by the following criteria: $RMSEA < .06$ CFI (or GFI) $> .95$, and non-significant chi-square p-values (Hu & Bentler, 1999; McDonald & Ho, 2002). All statistical analyses were conducted using Statistical Analysis System (SAS), (version 9.3, Cary, NC).

Results

A one-way Analysis of Variance (ANOVA) was conducted to look at racial group differences on EID exploration, EID affirmation, depression and anxiety.

Ethnic Identity. Significant differences between all three groups (Caucasians, African Americans, and multiracial) were found in the EID exploration: $F(2, 4655) = 114.14, p < .001$, and affirmation: $F(2, 4643) = 49.98, p < .001$. Post-hoc comparisons using Tukey's tests were conducted to determine the nature of these differences. For the level of exploration, Caucasians had the lowest ($M = 2.12$), then multiracial adolescents ($M = 2.33$) and finally African Americans ($M = 2.64$), with significant differences emerging between all three groups. For the level of affirmation, Caucasians had the lowest ($M = 2.80$), then multiracial adolescents ($M = 2.86$), and finally African Americans ($M = 3.18$). A statistically significant difference ($p < .001$) in affirmation occurred between African Americans and multiracial adolescents, and African Americans and Caucasians. No other significant difference were found.

Mental Health. There were no significant differences in depression between African Americans ($M = 2.16$) and Caucasians ($M = 2.19$). Multiracial adolescents had a significantly higher level of depression ($M = 2.31$) than both groups based on multiple comparison using Tukey's tests. Multiracial youth had significantly higher levels of anxiety ($M = 2.75$) than African Americans (2.49). No other significant differences were found. Results are presented in Table 1.

MIMIC Model for Caucasian and Multiracial Adolescents

The MIMIC model for Caucasian and multiracial adolescents is shown in Figure 1. Overall, the CFI and GFI indicated a good model fit, although the RMSEA marginally disagreed with other indices. The goodness-of-fit indices: $\chi^2(4) = 166.77 (p < 0.001)$; CFI=0.986; RMSEA=0.098; GFI=0.991. In the MIMIC model, the observed variables (EID Exploration,

EID Affirmation, school diversity, gender, and ethnicity) significantly predicted the latent variable (mental health issues). EID Exploration was significantly positively associated with mental health issues, and the EID Affirmation was significantly negatively associated with mental health issues. School diversity was significantly positively associated with mental health issues. Gender was a significant predictor for mental health issues. Based on the model, female high school adolescents had higher risk of mental health issues than males. Ethnicity also significantly predicted mental health issues. Multiracial high school adolescents were more likely to have mental health issues than Caucasians. The interaction of school diversity with ethnicity was negative and significant, indicating that multiracial high school adolescents with higher school diversity scores had lower risk of mental health issues and, in contrast, Caucasians with higher school diversity scores had higher risk of mental health issues.

[INSERT FIGURE 1 HERE]

MIMIC Model for African American and Multiracial Adolescents

The MIMIC model is presented in Figure 2. In general, the CFI and GFI indicated a good model fit, even though the RMSEA roughly disagreed with other indices. In the MIMIC model, the observed variables (EID Exploration, EID Affirmation, gender, and ethnicity) significantly predicted the latent variable (mental health issues). EID Exploration was significantly positively associated with mental health issues, and EID affirmation was significantly negatively associated with mental health issues. Gender was a significant predictor of mental health issues. Female high school adolescents were more likely than males to have mental health issues. Ethnicity also significantly predicted mental health issues. Multiracial high school adolescents were more likely to have mental health issues than African Americans.

No significant differences were found on the impact of school diversity on mental health outcomes between African American and multiracial youth.

[INSERT FIGURE 2 HERE]

Discussion

Research on the identity development of multiracial adolescents remains scant (Renn, 2008; Rockquemore et al. 2009). The purpose of this study was to explore the differential impact of school diversity and investigate the components of ethnic identity on outcomes of multiracial adolescents. We investigated levels of ethnic identity exploration and affirmation, and levels of depression and anxiety, between multiracial adolescents and their monoracial minority and majority peers. To extend the literature we investigated whether or not a relationship exists between ethnic identity exploration and affirmation, and mental health issues for all racial groups while considering the diversity of the school context.

Ethnic Identity Differences

The results of the current study supported our original hypotheses, finding differences in ethnic identity development across racial groups. Significant differences between all three groups were found in the ethnic identity subscales of exploration and affirmation. Caucasians had the lowest level of exploration and affirmation, then multiracial adolescents, and finally African Americans, with significant differences emerging between all three groups. This is consistent with existing research that finds that the overall ethnic identity of multiracial individuals tends to be stronger than their monoracial ethnic majority peers (i.e., Caucasians) and weaker than their monoracial ethnic minority peers (i.e., African Americans; Bracey et al., 2004; Brittan et al., 2013; Jones, 2000). Furthermore, our findings are consistent with studies finding that multiracial adolescents may experience less commitment to their ethnic identity than other

groups (Bracey et al., 2004). Multiracial individuals in our sample had lower scores on the EID affirmation subscale indicating less commitment to an ethnic identity than African Americans. This confirms the shift away from grouping multiracial individuals into the minority category, as their experiences in identity development differ significantly from monoracial minorities (Rockquemore et al., 2009). Further, there are theories that attempt to explain why multiracial individuals do not think about what it means to be an ethnic minority as much as monoracial minority individuals. One theory posits that an individual may be more likely to think about the fact that they are an ethnic minority if they “look” more like an ethnic minority. The phenotypic differences in multiracial individuals may force some, but not all members of this population to explore what it means to be a member of an ethnic minority group (Herman, 2004).

Mental Health Differences

The current study explored differences in levels of depression and anxiety between multiracial and monoracial adolescents. No formal hypothesis was examined due to inconsistencies in the literature. Our findings indicated that multiracial adolescents reported significantly higher levels of depressive symptoms than African American and Caucasian adolescents. Multiracial adolescents reported significantly higher levels of anxiety than African American adolescents, and similar levels as Caucasian adolescents. Additionally, using mental health as a latent variable for anxiety and depression, multiracial adolescents were found to have more mental health issues than monoracial Caucasians and African Americans. This is consistent with other investigations that have found higher levels of depression in multiracial adolescents than in adolescents from other ethnic groups (Cooney & Radina, 2000; Milan & Keiley, 2000).

These findings contribute to current theories in the field that posit that the complex nature of identity development for multiracial youth may make them more vulnerable to mental health issues (Brown, 1990; Park, 1928; Stonequist, 1961; Teicher, 1968; Williams & Thornton, 1998). While previous investigations claim the increased risk for mental health issues multiracial individuals experience may be due to the complex nature of their ethnic identity development, the current investigation took the first step in examining the complexity of identity development in multiracial individuals. This is in need of future investigation.

EID and Mental Health

The results of the current study supported our hypothesis that exploration and affirmation were significantly related to mental health issues. Exploration was significantly related to more mental health issues, and affirmation was significantly related to less mental health issues for all groups, including multiracial adolescents. These results are consistent with those investigating monoracial minority groups (Phinney, 1992; Roberts et al., 1999; Yip et al., 2006) and the multiracial population (Coleman & Carter, 2007; Lusk et al., 2010), that have documented a negative relationship between the strength of an individual's ethnic identity and measures of depression. Further, our findings support those who suggest that the complex nature of identity development for multiracial adolescents may lead to weaker identity development and thus more issues with psychological adjustment (Brown, 1990; Park, 1928; Stonequist, 1961; Teicher, 1968; Williams and Thornton, 1998). Our results extend the literature by demonstrating that a relationship between the mental health issues multiracial adolescents experience and where they are in their ethnic identity development exists. While the research investigating the relationship between psychological well-being and ethnic identity development in multiracial youth is still in its infancy, our results confirm ethnic identity achievement or affirmation contributes to positive

psychological outcomes for multiracial individuals as it does for monoracial minority individuals (Phinney, 1989).

School Diversity, Race and Mental Health

The investigation of school diversity and mental health issues was exploratory in nature due to the limited research conducted in this area. Results indicated that school diversity was related mental health issues in the MIMIC model with Caucasian and multiracial adolescents, but not significantly related to mental health issues in the MIMIC model with African American and multiracial students. More specifically, multiracial high school adolescents in more diverse high school settings have lower risk of mental health issues and, in contrast, Caucasians in more diverse high school settings have higher risk of mental health issues. These findings are congruent with some other investigations (e.g., Brown 2001; Thornton & Gates, 2001), and incongruent with others (Brittian et al., 2013).

Although research in this area is limited, theories do exist that explain why more diverse high school settings may lead to lower mental health issues for multiracial youth. Previous investigations have found that environments with more interracial families foster psychological adjustment among multiracial children (Pinderhughes, 1995). More diverse high school settings are more likely to have a higher number of interracial families, thus increase the risk for positive psychological adjustment and decrease the risk for mental health issues. Further, multiracial students appear to feel the most belonging in a context that accepts a fluid identity, rather than a context that forces them to choose one racial group over another (Renn, 2000). School settings with more diversity may be more likely to accept an individual's fluid ethnic identity and therefore may serve as a protective factor against mental health issues.

Limitations

Although this study provides valuable information regarding the experiences of multiracial youth, there are some limitations that should be noted. First, due to the limited geographic region from which the data were collected, the results are not generalizable, but rather provide an example of how the investigated variables are related in this specific sample. Second, due to our survey sampling techniques, our sample consists of multiracial youth that identify as multiracial, without considering nuanced differences between combinations of ethnicities. This is an important distinction as there has been considerable debate in the literature surrounding the identification of multiracial youth (Brittian et al., 2013). However, research has found that this method of identification is acceptable for the variables of interest (Bracey et al., 2004), finding that there were no significant differences between subgroups of multiracial youth on our variables of interest. Lastly, the use of the MEIM (Roberts et al., 1999) may prove to be a difficult measure to complete for students from Caucasian and multiracial backgrounds. Questions such as “I participate in cultural practices of my own group, such as special food, music, or customs” may prove to be confusing for some adolescents.

Despite these limitations, the study contributes important information about an understudied group. Our results suggest that the multiracial population is more at-risk for mental health issues and that there is even more risk if multiracial students have not achieved an ethnic identity or are still in an exploration stage. Future research should investigate the development of ethnic identity over time. More specifically, effort should be spent investigating mental health issues and ethnic identity formation in context in a longitudinal sample of youth making the transition from early adolescence into young adulthood.

Ethical Standards

Data collected for this study has been approved by the Institutional Review Board/ethnics committee at Michigan State University and the research has been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

Conflict of interest

There are no conflicts of interests involved in the conduct of this research.

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Table 1: Descriptive Statistics

	Caucasian n=4197	African American n=354	Multiracial n=215	ANOVA F value (p-value)	Post Hoc Test (Tukey)
Gender					
Male (%)	45.48	45.48	42.79	-	
Female (%)	54.52	54.52	57.21	-	
School Diversity					
Simpsons Index (95% C.I.)	0.184 (0.18 , 0.19)	0.251 (0.24 , 0.27)	0.245 (0.23 , 0.26)	64.31 (<0.001)	2>1, 3>1
MEIM					
Exploration (95% C.I.)	2.12 (2.10 , 2.14)	2.64 (2.57 , 2.71)	2.33 (2.23 , 2.42)	114.14 (<0.001)	2>3, 2>1, 3>1
Affirmation (95% C.I.)	2.80 (2.78 , 2.82)	3.18 (3.11 , 3.25)	2.86 (2.76 , 2.96)	49.98 (<0.001)	2>3, 2>1
Mental Health Issues					
Depression (95% C.I.)	2.19 (2.17 , 2.21)	2.16 (2.10 , 2.23)	2.31 (2.22 , 2.41)	3.85 (0.021)	3>2, 3>1
Anxiety (95% C.I.)	2.63 (2.60 , 2.65)	2.49 (2.40 , 2.57)	2.75 (2.64 , 2.87)	7.86 (<0.001)	3>2, 1>2

Table 2: The indirect effects of observed variables on indicators (anxiety and depressive symptoms) of mental health issues

Caucasian and Multiracial Adolescents	African American and Multiracial Adolescents
------------------------------------------	-------------------------------------------------

Variables	Anxiety ($b_{anxiety}$)	Depressive Symptoms (b_{ds})	Anxiety ($b_{anxiety}$)	Depressive Symptoms (b_{ds})
MEIM: Exploration	0.083**	0.074**	0.164*	0.134*
MEIM: Affirmation	-0.090**	-0.081**	-0.156*	-0.127*
School Diversity	0.045*	0.041*	0.063	0.052
Gender	-0.301**	-0.269**	-0.234**	-0.191**
Race	0.076*	0.068*	0.276**	0.225*
School Diversity*Race	-0.058*	-0.052*	-0.160	-0.131

*: $p < 0.05$; **: $p < 0.01$

Figure 1.

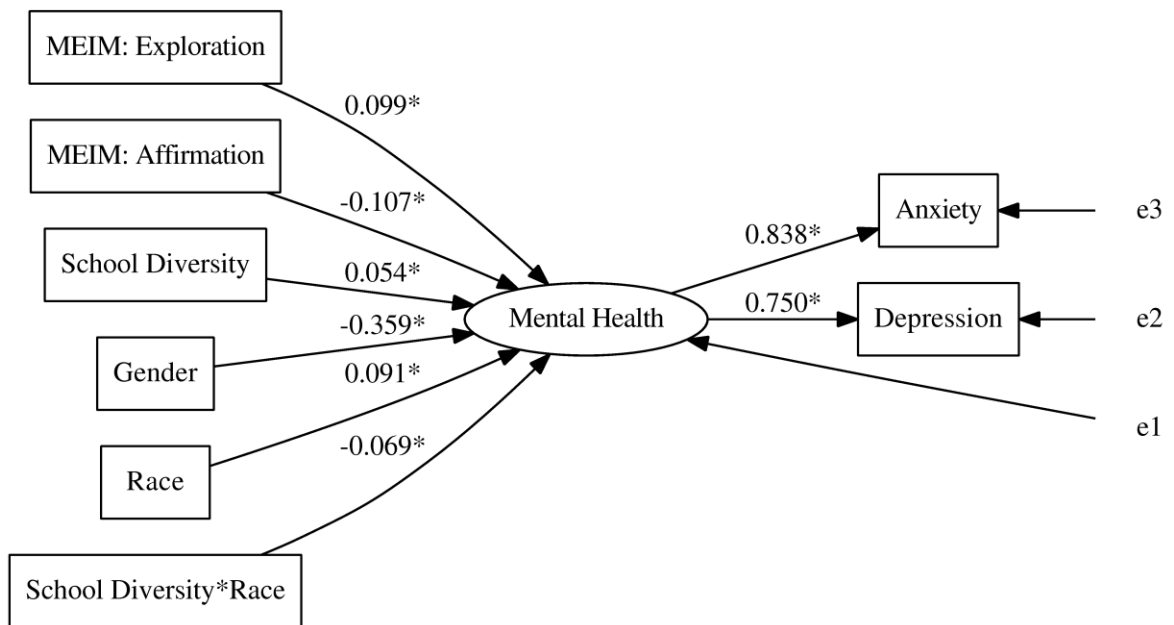


Fig. 1 The MIMIC model for Caucasian and multiracial high school adolescents, where the estimated coefficient with * indicates the statistical significance ($p < 0.05$). The goodness-of-fit indices: $\chi^2(4) = 166.77$ ($p < 0.001$); CFI=0.986; RMSEA=0.098; GFI=0.991

Figure 2.

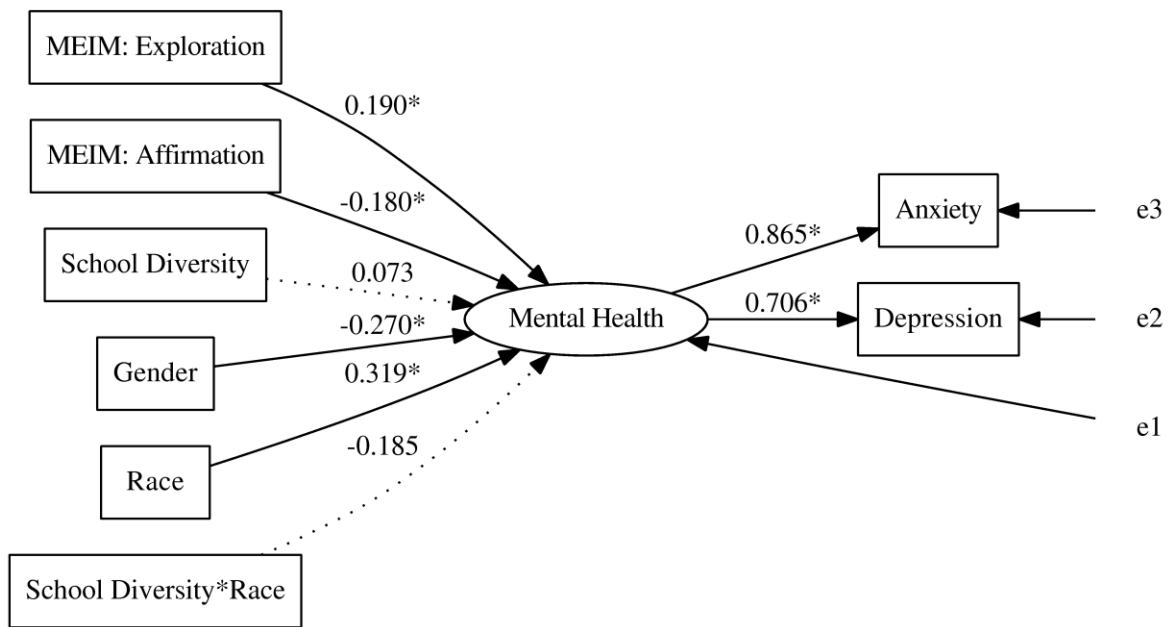


Fig 2 The MIMIC model for African American and multiracial high school adolescents, where the estimated coefficient with * indicates the statistical significance ($p < 0.05$). The goodness-of-fit indices: $\chi^2(4) = 16.19$ ($p = 0.003$); CFI=0.992; RMSEA=0.074; GFI=0.993

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Author Contributions

The contribution of each author is as follows: SF conceived of the study, participated in the design, coordinated the written document, and helped draft the document; JR contributed to the intellectual content of the written document and helped draft the document; WWH participated in the design, performed the statistical analysis, and helped draft the document; JB contributed to the design, and coordination of the study and contributed intellectually to the ideas; KT contributed intellectually to the study and helped draft the document. All authors have given final approval of the version to be published.

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Research Interests: Dr. Fisher's research interests surround identity formation in diverse school contexts. Her research focuses on traditional minority groups (i.e. African American and multiracial) as well as numerical minorities such as Caucasian students in predominately African American urban schools.