

DEVELOPING CULTURALLY-ADAPTED MOBILE MENTAL HEALTH  
INTERVENTIONS: A MULTI-STUDY, MIXED METHODS APPROACH

Henry Artez Willis

A dissertation submitted to the faculty at the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Department of Psychology and Neuroscience (Clinical).

Chapel Hill  
2020

Approved by:

Enrique W. Neblett, Jr.

Shauna Cooper

Karen Gil

Oscar Gonzalez

Deborah Jones

© 2020  
Henry Artez Willis  
ALL RIGHTS RESERVED

## **ABSTRACT**

Henry Artez Willis: Developing Culturally-Adapted Mobile Mental Health Interventions: A Multi-Study, Mixed Methods Approach  
(Under the direction of Enrique W. Neblett, Jr.)

African American young adults are less likely to have access to evidence-based treatments for mental health symptoms, yet mobile-Health (mHealth) interventions may increase access to evidence-based treatment options. For mHealth interventions to be effective, it is important that they are culturally-adapted to address the unique sociocultural risk and protective factors that may impact psychological well-being for this group (i.e., online racial discrimination and racial identity beliefs, respectively). This dissertation will explore a variety of questions over three studies that will lay the foundation for the development of culturally-adapted mHealth interventions for mental health for African American young adults. In the first study, this dissertation explores how experiences of online racial discrimination and racial identity beliefs together are associated with psychological distress within a sample of African American young adults. In the second study, the dissertation examines changes in racial identity and psychological distress in a sample of African American college students using five waves of data collected over three years. Finally, in study 3, the dissertation utilizes focus groups of African American young adults to inform the development and design of culturally-adapted mHealth applications. Together, the current dissertation has the potential to produce an increased understanding of how unique sociocultural risk and protective factors (i.e., online racial discrimination and racial identity development, respectively) affect the psychological well-being

of African American young adults and puts forth recommendations for addressing these factors in culturally-adapted mHealth technologies.

## TABLE OF CONTENTS

LIST OF TABLES.....	viii
LIST OF FIGURES.....	ix
INTEGRATIVE INTRODUCTION: .....	1
Current Dissertation.....	3
Methodology.....	4
Implications.....	5
REFERENCES.....	7
STUDY 1: The Associations between Online Racial Discrimination, Racial Identity Beliefs, and Psychological Well-Being.....	9
Theoretical Framework.....	10
Developmental Significance.....	11
Conceptualizing Online Racial Discrimination (ORD) .....	12
ORD and Psychological Well-Being.....	13
The Protective and Promotive Nature of Racial Identity.....	14
Social Networking Sites as a Context for Exploring ORD, Racial Identity, and Psychological Well-Being.....	17
Limitations of Existing Research.....	19
Current Study.....	20
Method.....	21
Results.....	25

Discussion.....	28
Conclusion.....	33
REFERENCES.....	34
STUDY 2: Racial Identity Changes Over Time: Examining Changes in Stable Racial Identity Dimensions and their Association with Psychological Distress using the Multidimensional Model of Racial Identity.....	39
Developmental Significance.....	40
Racial Identity Development.....	40
The Multidimensional Model of Racial Identity.....	41
Racial Identity and Psychological Well-Being.....	43
Limitations and Current Study.....	44
Method.....	46
Results.....	49
Discussion.....	51
REFERENCES.....	57
STUDY 3: Developing Culturally-Adapted Mobile Mental Health Interventions: A Mixed Methods Approach.....	62
Barriers to Traditional Mental Health Treatments among African American Young Adults.....	63
The Promise of mHealth Technologies.....	64
Sociocultural Risk and Protective Factors that Influence Psychological Well-Being.....	65
Limitations of Existing Research.....	66
Current Study.....	68
Method.....	69
Data Analytic Plan.....	75

Results.....	76
Discussion.....	94
Conclusion.....	103
REFERENCES.....	104
INTEGRATIVE DISCUSSION.....	109
Integrated Summary of Main Findings.....	109
Clinical Implications: Developing Culturally-Adapted mHealth Interventions.....	113
Future Directions for Research.....	116
Conclusion.....	119
REFERENCES .....	121
APPENDIX A: TABLES AND FIGURES FOR STUDY 1.....	123
APPENDIX B: TABLES AND FIGURES FOR STUDY 2.....	129
APPENDIX C: SEMI-STRUCTURED FOCUS GROUP GUIDE FOR STUDY 3.....	134
APPENDIX D: TABLES AND FIGURES FOR STUDY 3.....	137

## LIST OF TABLES

Table A1. Correlation Matrix of Main Study Variables.....	123
Table A2. Summary of Multiple Regression Analysis Predicting Psychological Distress From Vicarious ORD, Racial Centrality, and Covariates (N = 90) .....	125
Table A3. Summary of Multiple Regression Analysis Predicting Psychological Distress From Vicarious ORD, Private Regard, and Covariates (N = 90) .....	126
Table B1. Means and Standard Deviations of Primary Study Variables.....	129
Table B2. Correlations among Racial Identity Variables and Psychological Distress.....	130
Table B3. Latent Growth Models of Key Study Variables.....	131
Table D1. Correlation Matrix of Key Study Variables.....	137
Table D2. Overview of Themes related to African American Young Adults' Perceptions of Race, Race-Related Stressors, Mental Health, and Mental Health Treatment Seeking.....	139
Table D3. Features, Preferences, and Content for Culturally-Adapted mHealth Interventions. ....	140
Table D4. Participants' Evaluations of Current mHealth Interventions.....	141



## LIST OF FIGURES

Figure A1. The association between vicarious ORD and psychological well-being was significant and negative for those with high Racial Centrality, and significant and positive for those with low Racial Centrality.....	127
Figure A2. The association between vicarious ORD and psychological well-being was significant and negative for those with high Private Regard. ....	128
Figure B1. Latent Growth Model of Private Regard and the Global Severity Index score (GSI; Psychological Distress).....	132
Figure B2. Latent Growth Model of Public Regard and the Global Severity Index score (GSI; Psychological Distress).....	133

## INTEGRATIVE INTRODUCTION

African American young adults suffer from negative mental health symptoms at either similar or greater rates than that of White Americans, yet they are seven times less likely to have access to or receive effective treatments (Agency of Healthcare Research and Quality, 2013). Given that mental illness contributes to 90% of suicides and that African American young adults are more likely to attempt suicide (U.S.D.H.H.S.O.M.M.H, 2016), the disparity in mental health treatments within these communities is a concerning public health issue. Fortunately, mobile-health (mHealth) technology may transform mental health services and address disparities in mental healthcare. A meta-analysis of mHealth for mental health has shown that it can effectively reduce symptoms related to depression, anxiety, and substance use (i.e., Donker et al., 2013). A study of mHealth created for African American rural families showed that when culturally-adapted mHealth technology is designed, it is just as effective as usual treatments. In fact, this study suggested that culturally-adapted mHealth may be more effective than traditional treatments as racial-ethnic minorities were more likely to use mHealth than attend in-person sessions (Murry et al., 2018).

For mHealth to be effective for African Americans, it is important to understand the unique risk and protective factors that influence mental health for this population. Two such sociocultural factors that have a large impact on the psychological well-being of African American young adults are experiences of racial discrimination and racial identity beliefs. African American young adults continue to experience more racial discrimination than any other minority group in the U.S. (i.e., Chou, Asnaani, & Hoffman, 2012), especially in online contexts

such as social media (Tynes et al., 2012; Keum & Miller, 2017). Additionally, perceived experiences of discrimination are linked to negative psychological outcomes (e.g., decreased self-esteem and decreased positive outcomes, increased anxiety, depressive symptoms; Schmitt et al., 2014). Yet, not all African Americans who experience racial discrimination are impacted by it in the same way, and research has shown that racial identity can both protect against experiences of racial discrimination (e.g., Brondolo et al., 2009; Willis & Neblett, 2018), as well as promote better psychological outcomes (i.e., Rivas-Drake et al., 2014). For instance, racial identity and belonging may reduce the pain of ostracism that African Americans experience as a result of discrimination (Rivas-Drake et al., 2014). Additionally, positive racial-ethnic attitudes and affect are positively associated with well-being and self-esteem, and negatively associated with depressive symptoms, externalizing and internalizing problem behaviors, and health risk outcomes (i.e., Smith & Silva, 2011).

### **Current Limitations**

There is an urgent need for culturally-adapted mHealth technologies for mental health symptoms for African American young adults. These technologies must address sociocultural factors such as racial discrimination and racial identity beliefs, especially since these factors have been shown to influence perceptions of mental health treatments (i.e., Cheng et al., 2013). Unfortunately, for such technology to be effective, the field must also improve its understanding of how this group currently experiences racial discrimination and is influenced by racial identity beliefs over time. For example, online racial discrimination has been shown to be associated with a variety of negative psychological outcomes for this group (Keum & Miller, 2017), but very few studies have looked at how this form of discrimination impacts mental health symptoms within African American young adults. Regarding racial identity, one limitation of prior research is the

failure to examine how racial identity beliefs protect against online experiences of racial discrimination. Another limitation is that few studies have explored how racial identity beliefs change during emerging adulthood, as well as how these changes are associated with changes in psychological functioning. Taken together, in order to be effective, culturally-adapted mHealth for African American young adults must incorporate novel findings on the associations between online racial discrimination, racial identity development, and psychological well-being/mental health.

Finally, research suggests that African American young adults are still underrepresented in mHealth research despite their high ownership of smartphones and the common use of smartphones as their primary access to the Internet (i.e., Zickuhr & Smith, 2012). This limits our understanding of how mHealth technologies should be developed and designed for this group. Going forward, researchers should pursue methods that include the lived experiences of this group in the design/development process of such technologies.

### **Current Dissertation**

The current dissertation explores a variety of questions over three studies that will lay the foundation for the development of culturally-adapted mHealth interventions for mental health for African American young adults. In the first study, this dissertation explores how experiences of online discrimination and racial identity beliefs together are associated with negative mental health outcomes within a sample of African American young adults. Specifically, the study investigates whether or not: 1) online racial discrimination has a negative association with psychological well-being; and 2) racial identity beliefs protect against experiences of online racial discrimination. In the second study, the dissertation examines changes in racial identity and psychological distress in a sample of African American college students using five waves of

data collected over three years. Specifically, this study asks: 1) do racial identity dimensions that are proposed to be stable actually change over time and are there individual variations in these changes, and 2) do initial levels and changes in racial identity dimensions predict changes in psychological distress over time. Finally, in study 3, the dissertation utilizes focus groups of African American young adults to inform the development and design of culturally-adapted mHealth applications. This study investigates: 1) what are African American young adults' perceptions of mental health and mental health treatment; and 2) what features African American young adults would want in culturally-adapted mHealth interventions. Together, the studies yield an increased understanding of how unique sociocultural risk and protective factors (i.e., online racial discrimination and racial identity development, respectively) affect the psychological well-being of African American young adults and put forth recommendations for addressing these factors in culturally-adapted mHealth technologies.

### **Methodology**

In order to be eligible to participate in all studies, students had to self-identify as African American and be between 18 and 25 years old. Study 1 utilized 95 African American college students (72% female) attending a predominately White institution in the southeastern United States. Eligible participants completed a battery of online questionnaires consisting of sociodemographic information (e.g., age, gender, socioeconomic status, etc.), experiences of online racial discrimination, racial identity beliefs, and current mental health symptoms. The research questions are explored using a variety of multivariate regression models. Study 2 consisted of 171 participants (69% female) who were assessed at five different times over three years. Eligible participants completed a battery of online and paper-and-pencil questionnaires consisting of sociodemographic information (e.g., age, gender, socioeconomic status, etc.), racial

identity beliefs, and mental health symptom distress. The research questions are explored using latent growth curve modeling, a structural equation modeling approach. Study 3 consisted of 38 participants across 12 focus groups (70% female). Eligible participants participated in a 90-minute focus group semi-structured interview that explored perceptions of mental health, features desired in an mHealth intervention for mental health, etc. The research questions were explored by thematic analysis (Braun & Clarke, 2006), which included summarizing, revising, mapping, and interpreting themes from the focus groups.

### **Implications**

This dissertation offers a variety of unique contributions to the field of psychology and beyond (i.e., public health). For instance, study one is one of the first to show how experiences of online racial discrimination, independent of and in tandem with racial identity beliefs, influence the psychological well-being of African American young adults. Additionally, given the frequent use of social media and its integration into daily life, this study is one of the first to show how discrimination on social media platforms influences the mental health of racial-ethnic minorities. Additionally, study two is one of the first to explore longitudinal changes in racial identity beliefs and how these changes are related to changes in psychological symptoms. Taken together, findings from the first two studies advance our knowledge of how sociocultural risk and protective factors influence the mental health of African American young adults. Finally, study three is one of the first qualitative studies to utilize a sample of African American young adults to inform the development of mHealth interventions. Analyses suggest that interventions should include unique and culturally-relevant features that are not currently available on the mHealth market, such as the inclusion of content related to coping with racial discrimination. Most importantly, the findings from this dissertation can be used as the foundation of the

creation of culturally-adapted mHealth interventions, which will help reduce current disparities in access to and utilization of evidence-based mental health treatments within African American young adult communities.

## REFERENCES

- Agency for Healthcare Research and Quality. (2013). National healthcare disparities report. Retrieved from <http://www.ahrq.gov/research/findings/nhqrdr/nhdr13/chap2-txt.html#fig231>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*, 77-101.
- Brondolo, E., Ver Halen, N. B., Pencille, M., Beatty, D., & Contrada, R. J. (2009). Coping with racism: A selective review of the literature and a theoretical and methodological critique. *Journal of Behavioral Medicine, 32*(1), 64–88. <https://doi.org/10.1007/s10865-008-9193-0>
- Cheng, H. L., Kwan, K. L. K., & Sevig, T. (2013). Racial and ethnic minority college students' stigma associated with seeking psychological help: Examining psychocultural correlates. *Journal of Counseling Psychology, 60*(1), 98–111. <https://doi.org/10.1037/a0031169>
- Chou, T., Asnaani, A., & Hofmann, S. G. (2012). Perception of racial discrimination and psychopathology across three US ethnic minority groups. *Cultural Diversity and Ethnic Minority Psychology, 18*(1), 74.
- Donker, T., Petrie, K., Proudfoot, J., Clarke, J., Birch, M. R., & Christensen, H. (2013). Smartphones for smarter delivery of mental health programs: A systematic review. *Journal of Medical Internet Research, 15*(11), 1–13. <https://doi.org/10.2196/jmir.2791>
- Keum, B. T. H., & Miller, M. J. (2017). Racism in digital era: Development and initial validation of the perceived online racism scale (PORS v1.0). *Journal of Counseling Psychology, 64*(3), 310–324. <https://doi.org/10.1037/cou0000205>
- Murry, V. M. B., Berkel, C., & Liu, N. (2018). The Closing Digital Divide: Delivery Modality and Family Attendance in the Pathways for African American Success (PAAS) Program. *Prevention Science, 19*(5), 642–651. <https://doi.org/10.1007/s11121-018-0863-z>
- Rivas-Drake, D., Syed, M., Umaña-Taylor, A., Markstrom, C., French, S., Schwartz, S. J., ... Yip, T. (2014). Feeling Good, Happy, and Proud: A Meta-Analysis of Positive Ethnic-Racial Affect and Adjustment. *Child Development, 85*(1), 77–102. <https://doi.org/10.1111/cdev.12175>
- Schmitt, M. T., Branscombe, N. R., Postmes, T., & Garcia, A. (2014). The consequences of perceived discrimination for psychological well-being: A meta-analytic review. *Psychological Bulletin, 140*(4), 921.
- Smith, T. B., & Silva, L. (2011). Ethnic identity and personal well-being of people of color: a meta-analysis. *Journal of Counseling Psychology, 58*(1), 42. <https://doi.org/10.1037/a0021528>



Tynes, B. M., Umaña-Taylor, A. J., Rose, C. a., Lin, J., & Anderson, C. J. (2012). Online racial discrimination and the protective function of ethnic identity and self-esteem for African American adolescents. *Developmental Psychology*, *48*(2), 343–355.  
<https://doi.org/10.1037/a0027032>

U.S. Department of Health and Human Services Office of Minority Mental Health. (2016). Mental health and African Americans. Retrieved from <http://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=24>

Willis, H. A., & Neblett Jr, E. W. (2018). OC symptoms in African American young adults: The associations between racial discrimination, racial identity, and obsessive-compulsive symptoms. *Journal of Obsessive-Compulsive and Related Disorders*, *19*, 105-115.

Zickuhr, K., & Smith, A. (2012). Digital differences.

## **STUDY 1: The Associations between Online Racial Discrimination, Racial Identity Beliefs, and Psychological Well-Being**

African American emerging adults experience online racial discrimination (ORD) at an alarming rate (i.e., Tynes, Reynolds, & Greenfield, 2004). This is particularly concerning given that ORD has been linked to host of negative psychological outcomes, such as increased levels of anxiety and depression (Tynes, Giang, Williams, & Thompson, 2008; Keum & Miller, 2017). In exploring the online contexts that ORD may occur, it is important to explore how these experiences occur via social media or social networking sites (SNS; e.g., Facebook, Twitter, etc.), given that 96% of African American young adults use a SNS of some kind, and SNS use among African Americans is greater than many other racial-ethnic groups (Smith & Anderson, 2018).

Fortunately, not all African American young adults who experience racism-related stress, such as ORD, are affected by it in the same way. For example, researchers have noted that racial identity – the personal significance and meaning of race (Sellers, Smith, Shelton, Rowley, & Chavous, 1998), may serve as a protective factor against the impact of racism-related stress on psychological well-being for African American young adults. Racial identity beliefs may enhance youths' self-concepts, influence their cognitive-appraising processes, and facilitate the development of adaptive coping styles (Neblett, Rivas-Drake, & Umaña-Taylor, 2012). In exploring the protective and promotive function of racial identity beliefs, the Multidimensional Model of Racial Identity (MMRI; Sellers et al., 1998) has been a valuable conceptualization of

ethnic/racial identity that helps explore how various racial identity beliefs and attitudes influence behavior.

Recent research on the associations between ORD, RI, and psychological well-being among African American young adults is limited in a variety of ways. First, very few studies have explored if racial identity beliefs are protective against online forms of discrimination. Some studies have looked at ethnic identity, but conceptualizations of RI using the MMRI may highlight which types of beliefs (i.e., the importance of race to one's self-concept, positive feelings about your race, beliefs about how your race should behave, etc.), are protective. Additionally, although "online contexts" can refer to a variety of spaces, such as internet forums, chat rooms, video gaming, etc., ORD on SNS may be a more pressing concern for this group, as they may be at an increased risk for experiencing ORD on these platforms given the high usage of SNS. In light of these limitations, the current study sought to explore how RI beliefs moderate the association between ORD on SNS and psychological well-being within a sample of African American young adults.

### **Theoretical Framework**

In exploring the association between ORD and psychological well-being, Clark, Anderson Clark, and Williams' (1999) biopsychosocial model of race-related stress suggests that experiences and perceptions of racial discrimination lead to physiological and psychological stress responses (e.g., anger, helplessness, paranoia, resentment, fear, etc.), that go on to influence health outcomes. In this context, experiences of ORD may lead to maladaptive stress responses, such as feelings of anger and helplessness, that go on to negatively influence psychological well-being among African American young adults. Additionally, other theoretical conceptualizations of youth development support the notion that racial identity beliefs lead to

better psychosocial outcomes and help minority youth achieve pivotal developmental competencies (e.g., adaptive cognitive, social, and emotional competencies; García Coll et al., 1996). In this context, racial identity may protect against ORD such that these beliefs may equip youth with coping mechanisms to reduce the negative impact that ORD has on psychological well-being (Neblett et al., 2012). Taken together, extant literature and theoretical frameworks highlight the complex associations that may exist between ORD, racial identity, and psychological well-being for African American young adults.

### **Developmental Significance**

African American young adults may be particularly vulnerable to or at an increased risk of experiencing race-related stress, such as ORD, during the developmental period of emerging adulthood (Hurd, Varner, Caldwell, & Zimmerman, 2014). Additionally, the developmental task of developing a healthy identity may be an area of increased stress for African Americans as they grapple with the significance and meaning of an identity that is commonly devalued in U.S. society (Graham, Sorenson, & Hayes-Skelton, 2014; Sue, 2010). Others have shown that the difficulties African American young adults face during this developmental period can be seen in increased risk for substance use (Doherty, Green, Reisinger, & Ensminger, 2008; Gil, Vega, & Turner, 2002) and suicide risk (Castle, Conner, Kaukeinen, & Tu, 2011). Taken together, these challenges that African American young adults face, combined with the developmental tasks of emerging adulthood (e.g., increasing autonomy, developing a positive self-concept and identity), highlight the need to explore this population's experiences of RD, ORD, and RI during this developmental period.

## Conceptualizing Online Racial Discrimination (ORD)

Negative race-related experiences, such as discrimination and exposure to negative race-related messages, are a common experience for African American youth and young adults in online contexts (i.e., Tynes et al., 2004). To better operationalize these experiences of online racial discrimination (ORD), Tynes, Umaña-Taylor, Rose, Lin, & Anderson (2012) conceptualized ORD to include “denigrating or excluding an individual on the basis of race through the use of symbols, voice, video, images, text, and graphic representations” (p.344). They also outlined that this may occur in several contexts, such as social networking sites, discussion boards, text messaging, web pages, online videos, and other platforms. ORD can include both individual experiences and vicarious exposure to negative race-related messages online. *Individual ORD* refers to discriminatory images, text, and symbols one’s racial group that are directly targeted to a specific person whereas *vicarious ORD* refers to vicarious experiences of discrimination that are directed to the individual’s racial group or same-race peers (Tynes, Rose, & Williams, 2010).

In regards to the frequency of these experiences, African American youth are likely to be exposed to negative remarks related to their race or racist images online (Tynes et al., 2004). One study found that two-thirds of a sample of African American adolescents had experienced either individual or vicarious forms of ORD, and that 20% of these youth had reported experiencing these events at least a few times a year (Tynes et al., 2012). Some studies have shown that vicarious ORD is a more prevalent experience for African American youth compared to individual ORD (Tynes et al., 2008). Others have shown that experiences of individual ORD may increase as youth mature (Tynes, Del Toro, & Lozado, 2015).

## **ORD and Psychological Well-Being**

Experiences of ORD have been linked to negative mental health outcomes. For instance, individual and vicarious forms of ORD have been linked to increased levels of anxiety, depression, and psychological distress among African American adolescents and young adults (Keum & Miller, 2017; Tynes et al., 2008; Tynes et al., 2012). ORD also has been linked to decreased academic motivation and negative perceptions of racial climates on college campuses (Tynes, et al., 2015; Tynes, Rose, & Markoe, 2013). In comparing the differential impact of both individual and vicarious ORD, some research suggests that only individual ORD is associated with depressive and anxiety symptoms, over and above offline experiences of RD (Tynes et al., 2008). These researchers postulate that vicarious ORD may be less harmful given that this type of discrimination is directed at the group-level and is more impersonal than individual ORD, which are usually personalized attacks. In contrast, others have found that vicarious ORD is a significant predictor of psychological distress and perceived stress for African American adults (Keum & Miller, 2017). In fact, it was found that these vicarious experiences of ORD explained additional unique variance in overall psychological distress when compared to an offline measure of discrimination, suggesting that these experiences may be even more deleterious than interpersonal experiences of discrimination (Keum & Miller, 2017).

It is important to note that Tynes et al. (2008) explored interrelations between ORD and psychological well-being among youth, whereas Keum & Miller (2017) explored these associations among adults. The two studies raise the possibility that there are developmental differences in the types of ORD that African Americans are exposed to. For example, African American adolescents may have more restrictions with regard to the frequency that they have access to sites that may have negative race-related online content (e.g., parental restrictions,

inability to access mobile phones while in school, etc.), which would not be expected to be the case for African American young adults. As a result, African American young adults may be at a higher risk of increased exposure to, and developing negative psychological symptoms as a result of, vicarious experiences of ORD.

### **The Protective and Promotive Nature of Racial Identity**

Though negative race-related experiences such as ORD are linked to negative psychological outcomes, resilience factors such as racial identity may help to protect against these experiences, as well as promote positive psychological outcomes, among African American young adults. Racial identity (RI) can be defined as the significance and qualitative meaning of race in the lives of African Americans, as indicated by individuals' attitudes and behaviors (Sellers et al., 1998). Researchers put forth that positive racial identity beliefs may help African American youth feel competent across behavioral, academic, and social domains, and may help them cope with negative cultural experiences and reduce the negative impact of these experiences (Neblett et al., 2012; Umana-Taylor, 2016). In support of this suggestion, nationally representative studies of racial identity among Black Americans have shown that feeling close to one's racial group and positive ingroup evaluations are associated with better subjective quality of life, specifically higher levels of happiness and positive affect about life (Kiecolt & Hughes, 2017).

As indicated earlier, racial identity beliefs can have both protective (i.e., can buffer against high levels of stress) and promotive (i.e., predict better outcomes at varying levels of risk and stress) for African American emerging adults (Masten, Cutuli, Herbers, & Reed, 2009) effects. In terms of the protective nature of racial identity, Brondolo, Ver Halen, Pencille, Beatty, and Contrada (2009) suggest that racial identity and belonging may reduce the pain of ostracism

that African Americans may experience as a result of discrimination. Racial identity beliefs can also promote more adaptive or positive psychological outcomes among African American young adults. Generally, positive feelings about one's race, have been shown to be positively associated with psychosocial adjustment and positive well-being among African American youth and young adults (e.g., Rivas-Drake et al., 2014; Smith & Silva, 2011). In the context of ORD, racial identity may not only protect against these experiences, but these beliefs may explain positive psychological outcomes among this group over and beyond experiences of online race-related stress (i.e., ORD).

The Multidimensional Model of Racial Identity (MMRI; Sellers et al., 1998) is a useful model for conceptualizing racial identity beliefs and their impact on psychological symptoms among African American young adults. This model conceptualizes racial identity as the significance and qualitative meaning that race has in the self-concepts of African Americans, and consists of four dimensions: *salience*, *centrality*, *regard*, and *ideology*. *Salience* measures the extent to which individuals' races are relevant to their self-concepts during a specific moment, whereas *centrality* corresponds to the extent to which individuals define themselves according to their race over time and across situations (Sellers et al., 1998). Both salience and centrality measure the significance individuals attach to being Black.

Additionally, *regard*, which measures the extent to which individuals feel positively about their race, and *ideology*, which measures individuals' beliefs, attitudes, or opinions about how they feel people from their race should act, reflect the perceptions one has about the meaning of being Black or African American (Sellers et al., 1998). Racial regard consists of two sub-dimensions: *public regard* and *private regard*. Public regard refers to the extent individuals feel that others view African Americans positively or negatively. Private regard measures the



extent to which individuals feel positively or negatively about being African American and about other African Americans. Finally, Sellers et al. (1998) describe ideology as consisting of four sub-dimensions: (1) *assimilationist* (which stresses the similarities between African Americans and American society); (2) *humanist* (which refers to the view that all humans, regardless of racial/ethnic background, are similar); (3) *oppressed minority* (which emphasizes the commonalities between the oppression that African Americans share with other minority groups); and (4) *nationalist* (characterized by views that the African American experience is unique).

There have been specific links between dimensions of the MMRI and psychological symptoms among African American young adults. For example, racial centrality has been linked to lower levels of psychological distress (Lee & Ahn, 2013; Sellers, Caldwell, Schmeelk-Cone, Marc, & Zimmerman, 2003), and higher levels of racial centrality have been shown to buffer against the impact of racial discrimination on perceived stress (Sellers, et al., 2003). Low levels of public regard have been shown to protect against the distress caused by discrimination (Sellers et al., 2003; Sellers & Shelton, 2003), and high levels of private regard have been associated with higher self-esteem and lower levels of psychological distress (Hurd et al., 2013; Neblett, Hudson Banks, Cooper, & Smalls-Glover, 2013; Oney, Cole, & Sellers, 2011). Finally, although less explored when compared to racial centrality and racial regard, racial ideology may shape how African American young adults respond to psychologically negative race-related events (Sellers & Shelton, 2003). For example, higher levels of nationalist ideology beliefs have been shown to protect against the distress caused by racial discrimination, and higher levels of humanist ideology have been related to fewer perceptions of racial discrimination (Sellers & Shelton, 2003)

Fewer studies have explored the associations between racial identity beliefs and ORD. One study, conducted by Tynes and Markoe (2010), found that those with color-blind racial identity attitudes were more likely not to be bothered by racist images on social media, and were more likely to condone or even encourage negative race-related online content. In contrast, those individuals, especially racial-ethnic minorities, with low color-blind racial identity attitudes were more likely to oppose the spreading of these racist images. Even more relevant, one study has explored ORD and ethnic identity beliefs (e.g., self-identification with one's ethnic group, ethnic identity achievement, and feelings of affirmation and a sense of belonging to one's ethnic group) among 125 African American adolescents (Tynes et al., 2012). These researchers found that for those with low levels of ethnic identity, individual ORD was associated with increased reports of anxiety symptoms, whereas those with high levels of ethnic identity beliefs were protected against the effects of individual ORD and reported fewer anxiety symptoms. Of note, this study included only African American adolescents and did not explore the effects of vicarious ORD, highlighting the need to continue to explore these associations in African American young adult samples.

### **Social Networking Sites as a Context for Exploring ORD, Racial Identity, and Psychological Well-Being**

Social media or SNS provide a valuable and unique context for exploring the interrelations between ORD, racial identity beliefs, and psychological symptoms. In fact, there are several, albeit complex, relationships between SNS and psychological symptoms, ORD, and racial identity. For example, studies have shown associations between social media use and negative psychological symptoms, including anxiety, depression, inattention, hyperactivity/impulsivity, ODD, loneliness, and substance use (e.g., Barry, Sidoti, Briggs, Reiter, & Lindsey, 2017;

Vannucci, Flannery, & Ohannessian, 2017; Ilakkuvan, Johnson, Villanti, Evans, & Turner, 2018). In a nationally representative study of nearly 1,800 young adults, it was found that those who use between seven and eleven social media channels had higher odds of having increased depressive and anxiety symptoms from those who use only 0 and 2 platforms (Rollins, McCusker, Carlson, & Stroll, 2017). These relationships are complex, as others have shown that more social media use is *not* associated with negative outcomes, such as loneliness and quality of life (Brusilovskiy, Townley, Snethen, & Salzer, 2016). These differential findings may be influenced by other factors, such as age, as some have shown that there is a positive relationship between social media use and psychological distress for adults over 30, whereas there is a *negative* relationship between social media use and psychological distress for adults between the ages of 18 and 29 (Hardy & Castonguay, 2018). Together, the conflicting findings highlight the continued importance of exploring experiences with social media among young adults.

Regarding ORD, social media is a unique context as it allows individuals the ability to remain anonymous, which is a concern for young African Americans given that scholars have posited that the average American is more likely to engage in discriminatory behavior in online contexts when they can remain anonymous (Glaser & Kahn, 2005). Given the high usage of SNS among African American young adults (Smith & Anderson, 2018), ORD on these sites may be a pervasive and frequent experience that has an influence on negative mental health symptoms, either individually through posts or tweets, or vicariously through the spread of racist images, videos of police shootings, etc. In fact, one study found that African American youth reported that 50% of ORD occurred on social networking sites, and that they were more likely to experience ORD on social media (Tynes et al., 2008). Finally, in terms of racial identity, African American young adults may use social media to explore and reaffirm their racial identity beliefs.

In general, youth's developmental task of identity exploration and formation can extend to social media contexts, and studies have shown that youth use these outlets to explore identity, experience a sense of independence, and establish a social network and sense of social support (Radovic, Gmelin, Stein, & Miller, 2017). This may be an even more prevalent occurrence for African American young adults, as studies that have monitored conversations on online networks have shown that discussions of race and racism occur frequently in these contexts (Tynes et al., 2004). Taken together, social media may uniquely facilitate experiences of ORD and influence beliefs about racial identity for African American young adults.

### **Limitations of Existing Research**

Several studies have shown that ORD is a prevalent and pervasive experience for African American young adults (e.g., Tynes et al., 2012; Keum & Miller, 2017). Given the increased usage of SNS and anonymity of the internet, it could be that ORD on these platforms has a stronger association with mental health symptoms than ORD on other online platforms (i.e., gaming networks). Moreover, most previous studies of ORD have looked at the link between these experiences and psychological health in adolescents (i.e., Tynes et al., 2008), and previous studies have urged researchers to begin to explore the link between ORD and psychological outcomes in adulthood samples (i.e., Lewis, Cogburn, & Williams, 2015). Doing so may be even timelier for emerging adults who are students at a predominately White institution (PWI). For example, others have shown that campus life and interactions may be taking place at an increased frequency on social media sites (Lampe, Ellison, & Steinfield, 2006). As a result, African American emerging adults at a PWI may be more likely to experience individual or vicarious forms of ORD as they are more likely to be connected to others outside of

their race via social media and therefore more at risk for being targeted online or seeing racist content online from peers.

Though racial identity beliefs and experiences of discrimination together influence psychological symptoms (Yip, 2018), few studies have explored how racial identity beliefs utilizing the MMRI are protective against ORD. Previous studies using ethnic identity limit our understanding of what specific aspects of racial identity are protective, as others have shown that some racial identity beliefs may increase risk for developing psychological distress as a result of increased perceptions of race-related stressors (i.e., Sellers & Shelton, 2003). There is an urgent need for studies that utilize a multidimensional approach to studying how racial identity may moderate the association between ORD and psychological well-being. Finally, it is imperative that future studies explore how constructs such as ORD exist on social media use. For instance, given the many links between social media and psychological well-being (e.g., Barry et al., 2017; Vannucci et al., 2017), as well as the high usage of social media by African American young adults (Smith & Anderson, 2018), African American young adults may be at increased risk of experiencing psychological distress due to being at an increased risk of experiencing ORD by using these platforms.

### **Current Study**

In light of the aforementioned limitations, the current study sought to explore how racial identity beliefs may moderate the association between experiences of ORD and psychological well-being. First, in line with the biopsychosocial model of race-related stress and extant literature (e.g., Clark et al., 1999; Keum & Miller, 2017; Tynes et al., 2008) it was expected that both individual and vicarious forms of ORD would be associated with higher levels of psychological distress for African American emerging adults. Additionally, given the protective

nature of racial identity beliefs (e.g., Garcia Coll et al., 1996; Neblett et al., 2012), it was expected that racial identity beliefs would moderate the association between ORD and psychological distress in a variety of ways. More specifically, it was expected that high levels of racial centrality and private regard, and low levels of public regard, would protect against experiences of ORD and be associated with decreased levels of psychological distress (e.g., Brondolo et al., 2009; Hurd et al., 2013; Lee & Ahn, 2013). Alternatively, racial ideology is expected to have differing effects that either exacerbate or buffer the association between ORD and psychological distress. For example, based on extant literature, higher levels of nationalist and humanist ideology may be associated with lower levels of psychological distress (Sellers & Shelton, 2003), whereas assimilationist ideology may be associated with increased levels of psychological distress (Sellers, Chavous, & Cooke, 1998).

## **Method**

### **Participants**

Participants were African American first-year students who participated in a longitudinal study of health and life experiences at a mid-size, public, southeastern, predominantly-White university in the United States. To be eligible to participate, students had to be a college student at the university where the study was conducted, be at least 18 at the beginning of the study, and self-identify as African American. Data collection was conducted in five waves, with approximately eight months between each wave of data collection, but this study's sample utilized the final wave of data. The first wave was comprised of 171 students (69% female, mean age = 18.3). The current wave of data was comprised of 95 students (72% female; mean age = 21). Family socioeconomic status was reported as: Very Poor = 7.6%, Working Class = 20.7%, Middle Class = 50%, and Upper Middle = 20.7%.

## Procedure

Following university Institutional Review Board approval, participants were recruited utilizing a list of incoming African American students provided by the university registrar's office. Students were contacted via email and asked to participate in a longitudinal study examining the impact of stressful life experiences on the mental and physical health of African American college students. Eligible participants completed a battery of online and paper and pencil questionnaires in survey administrations lasting approximately one hour. Participants completed the same battery of questionnaires during subsequent waves of data collection approximately eight months after the completion of the first survey. Racial-ethnic minority research assistants administered the online questionnaires at each time point, and participants received a payment of \$15 for participating in each wave of data collection.

## Measures

**Demographic Information.** Study participants reported demographic data, which were used as covariates in the analyses. This information consisted of gender, age, race/ethnicity, and mothers' highest level of educational attainment (1 = *Elementary School* to 7 = *Graduate or professional degree*). Extant literature suggests that parental educational attainment may be a more accurate measure of SES (Almeida, Neupert, Banks, & Serido, 2005; Grzywacz, Almeida, Neupert, & Ettner, 2004). As a result, parental educational attainment was utilized as an indicator for SES. Additionally, participants indicated how much time they utilized SNS (i.e., Facebook, Twitter, and Instagram) on a daily basis, from 0 = *I don't do this* to 5 = *6 or more hours*. The sum of daily frequency on Facebook, Instagram, and Twitter were averaged together to create a mean score of SNS use, with higher scores corresponding to more daily frequent use of SNS.

**Online Racial Discrimination.** The Online Victimization Scale (OVS; Tynes et al., 2010) was used to assess ORD. The OVS consist of items with responses ranging from 1 = *never happened* to 6 = *a daily basis*, assessing both vicarious and individual, or personally-mediated, experiences of ORD. The *vicarious ORD subscale* consists of three items such as, “People have cracked jokes about people of my race or ethnic group online” ( $\alpha = .91$ ), whereas the *individual ORD subscale* consists of four items such as, “People have said mean or rude things about me because of my race or ethnicity” ( $\alpha = .54$ ). Previous studies have illustrated the constructive validity of the measure and has demonstrated adequate internal consistency, with Cronbach alphas ranging from .78 to .87 (Tynes et al., 2012; Tynes et al., 2015).

**Racial Identity.** The current study assessed racial identity beliefs using the shortened version of the Multidimensional Inventory of Black Identity (MIBI-S; Martin, Wout, Nguyen, Sellers & Gonzalez, 2010). Responses on the MIBI-S are rated from 1 = *strongly disagree* to 7 = *strongly agree*, with items assessing the three dimensions of racial identity: centrality, regard, and ideology. The *Centrality* scale, which consists of four items, measures the extent to which being African American is central to participants’ definitions of themselves or self-concept (i.e., “In general, being Black is important to my self-image”;  $\alpha = .83$ ). Higher scores on this scale relate to the belief that race is an important aspect in defining one’s self.

Next, the *Regard* scale is composed of two subscales assessing Public and Private Regard. The *Public Regard* subscale consists of four items that measures the extent to which participants feel that other ethnic/racial groups have positive feelings toward African Americans (i.e., “Overall, Blacks are considered good by others”;  $\alpha = .87$ ), whereas the *Private Regard* subscale measures the extent to which participants have positive feelings toward African Americans in general (i.e., “I feel good about Black people;  $\alpha = .85$ ) and consists of three items.



Higher scores on the Private Regard subscale relate to the belief that the respondent has more positive feelings toward other African Americans and being an African American, whereas lower scores on the Public Regard subscale demonstrates a view that other racial-ethnic groups have a more negative view of African Americans.

The Ideology scale is comprised of four subscales: assimilationist, humanist, oppressed minority, and nationalist. The *Assimilationist* subscale, which consists of four items, assesses the extent to which participants emphasize the similarities between African Americans and mainstream American culture/systems (i.e. “Blacks should strive to be full members of the American political system”;  $\alpha = .78$ ). The *Humanist* subscale, composed of four items, measures the extent to which respondents emphasize the similarities among individuals of all racial-ethnic backgrounds (i.e. “Blacks should judge Whites as individuals and not as members of the White race”;  $\alpha = .72$ ). The *Oppressed Minority* subscale, which also consists of four items, measures the extent to which participants emphasize the similarities between African Americans and other ethnic/racial minority groups (i.e. “The racism Blacks have experienced is similar to that of other minority groups”;  $\alpha = .71$ ). Finally, the *Nationalist* subscale, which consists of four items, measures the extent to which participants emphasize the uniqueness of being African American or Black (i.e. “Whenever possible, Blacks should buy from other Black businesses”;  $\alpha = .82$ ). Previous studies support the construct and predictive validity for the MIBI in African American young adult samples (Banks & Kohn-Wood, 2007; Seaton, 2009; Sellers, Rowley, Chavous, Shelton, & Smith, 1997), with reliability analyses in previous studies producing Cronbach’s alphas that range from .61 to .81.

**Psychological Well-Being.** The Symptom Checklist 90-Revised (Derogatis, 2000; SCL-90-R) was used to assess the OC symptoms of participants. The SCL-90-R is a commonly

utilized 90-item self-report measure designed to screen for a range of psychopathological symptoms of distress (Schmitz, Hartkamp, & Franke, 2000). Participants were asked to indicate how much each item from the list of problems had distressed or bothered them during the past 7 days (0 = *not at all* to 4 = *extremely*), with higher scores corresponding to increased levels of psychiatric conditions. The SCL-90-R consists of 9 subscales (i.e., Somatization, Obsessive–Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism); however, the current study focused on the Global Severity Index (GSI), which is the average of all psychopathological symptoms of distress ( $\alpha = .96$ ). Higher scores on the GSI correspond to higher levels of distress from psychopathological symptoms, and therefore lower levels of psychological well-being.

## Results

### **Preliminary Analyses: ORD Experiences, Racial Identity Variables, and Psychological Distress**

Preliminary analyses consisted of examining means and standard deviations among individual and vicarious experiences of ORD, racial identity variables, and psychological distress (Table A1). Participants indicated that they used SNS, specifically Facebook, Twitter, and Instagram, between 1 hour or less or 1 to 2 hours on a daily basis ( $M = 2.16$ ,  $SD = 0.67$ ). On average, participants responded that they experienced individual ORD between never and once over the past six months ( $M = 1.39$ ,  $SD = 0.52$ ). In contrast, they reported that they experienced vicarious ORD between a few times a year to a few times a month over the past year ( $M = 3.26$ ,  $SD = 1.5$ ).

Regarding racial identity, participants reported high levels of assimilationist ideology ( $M = 5.75$ ,  $SD = 1.1$ ), racial centrality ( $M = 5.52$ ,  $SD = 1.2$ ), and private regard ( $M = 5.17$ ,  $SD =$

0.61). They also reported moderate levels of humanist ( $M = 4.48, SD = 1.08$ ), oppressed minority ( $M = 4.74, SD = 1.16$ ), and nationalist ideology ( $M = 4.76, SD = 0.92$ ). In general, participants reported low levels of public regard ( $M = 3.97, SD = 1.03$ ). Finally, participants reported low levels of overall psychopathological distress ( $M = 0.45, SD = 0.37$ ).

Next, I examined the zero-order correlations among ORD, racial identity, and psychological distress. Of note, average time on SNS was positively associated with increased levels of psychological distress ( $p = .009$ ). Additionally, more frequent experiences of individual ORD were associated with more frequent experiences of vicarious ORD ( $p < .001$ ). Higher levels of racial centrality, and lower levels of humanist ideology, were associated with more frequent experiences of both individual ( $p = .003$  and  $.001$ , respectively) and vicarious ORD ( $p = .002$  and  $.02$ , respectively). Finally, psychological distress was not associated with either individual or vicarious ORD at the bivariate level, but it was negatively associated with both public regard and assimilationist ideology ( $p = .003$  and  $.006$ , respectively).

### **Analytic Plan**

Multiple regressions were used to investigate the role of individual and vicarious ORD as a risk factor, and racial identity beliefs as a protective factor, in the context of psychological distress among African American young adults. With respect to covariates, age, gender, mother's education, and average time spend on SNS, were included in the models. Given the small sample size, individual and vicarious ORD were entered as main effect predictors of the outcome variable in separate multiple regression models to assess the independent effect of both risk factors on psychological well-being. Also, each racial identity dimension was entered in each individual and vicarious ORD models to assess the differential impact of all dimensions put forth by the MMRI (Sellers et al., 1998). All continuous independent variables and covariates were

mean-centered in all models. Only significant models are presented fully in the following analyses and accompanying tables. Based on the studentized residual by unstandardized predicted values scatterplot, the outcomes of GSI appeared to be positively skewed across the independent variables. As a result, GSI was log transformed, and subsequent plots appeared to conform to the assumption of homoscedasticity. All other assumptions for multiple regressions were met.

### **Associations between Individual ORD, Racial Identity, and Psychological Distress**

Analyses revealed that there were no significant main effects of individual ORD on psychological distress in the context of racial centrality, private regard, public regard, as well as assimilationist, humanist, oppressed minority, and nationalist ideologies ( $p > .05$  for all multiple regression models).

### **Associations between Vicarious ORD, Racial Identity, and Psychological Distress**

Analyses revealed that there were no significant main effects of vicarious ORD on psychological distress in the context of public regard, as well as assimilationist, humanist, oppressed minority, and nationalist ideologies ( $p > .05$  for all multiple regression models). In contrast, the omnibus test for the analytic model of vicarious ORD, racial centrality, and psychological well-being (Table A2) was significant, ( $F [7, 89] = 3.26, p = .004$ ; adjusted  $R^2 = .22$ ). With respect to main effects, the vicarious ORD and racial centrality were not significant predictors of psychological distress ( $p > .05$ ). There was a significant interaction between vicarious ORD and racial centrality ( $p = .03$ ; Figure A1). Analyses revealed that after controlling for the covariates, vicarious ORD had a significant positive relationship with psychological distress for those with low levels of racial centrality ( $b = .09, p = .04$ ). In contrast, there was a significant negative relationship between vicarious ORD and psychological distress for those

with high levels of racial centrality ( $b = -.11, p = .048$ ). This relationship was nonsignificant for those with average levels of racial centrality ( $b = -.01, p = .69$ ).

Additionally, the omnibus test for the analytic model of vicarious ORD, private regard, and psychological distress (Table A3) was significant, ( $F [7, 89] = 3.55, p = .002$ ; adjusted  $R^2 = .17$ ). Regarding the covariates, there was a significant relationship between average time on SNS and psychological distress, such that more frequent use of SNS was associated with increased psychological distress ( $b = .13, p = .05$ ). With respect to main effects, vicarious ORD and private regard were not significant predictors of psychological distress ( $p > .05$ ). There was a significant interaction between vicarious ORD and private regard ( $p = .03$ ; Figure A2). Analyses revealed that after controlling for the covariates, vicarious ORD had a significant negative relationship with psychological distress for those with high levels of private regard ( $b = -.17, p = .05$ ). This relationship was nonsignificant for those with low ( $b = .05, p = .23$ ) and average levels ( $b = -.01, p = .66$ ) of private regard.

## Discussion

The current study explored the associations between experiences of ORD, racial identity, and psychological well-being among a sample of African American young adults. The first aim of the study was to explore if individual and vicarious experiences of ORD would be associated with higher levels of psychological distress for African American young adults. Previous findings have been mixed with regard to the effect of individual versus vicarious ORD on mental health, in that some have indicated that individual experiences of ORD have a larger effect on mental health for African Americans, whereas others have indicated the opposite in favor of vicarious experiences of ORD (Tynes et al, 2008; Keum & Miller, 2017). This study is unique in that it suggests that among African American young adults, vicarious experiences of ORD may

be a better predictor of maladaptive mental health symptoms given that there no significant main or interaction facts between individual ORD, racial identity, and psychological well-being. One reason this may be the case is that among this sample, vicarious ORD was experienced more frequently when compared to individual ORD (nearly a few times a month versus once over the past year, respectively). This is consistent with other studies that suggest that vicarious ORD may be experienced more frequently than individual ORD among African American youth (Tynes et al., 2008), and that these vicarious experiences have a larger impact on psychological symptoms (Keum & Miller, 2017). Yet, this is inconsistent with previous studies that have suggested that experiences of individual ORD may increase as youth mature (Tynes et al., 2015). One reason for this discrepancy could be due to the increased visibility of and social consequences related to instances of individual ORD. For example, over the past two years, when experiences of ORD are committed by White adults, especially on SNS, backlash is usually swift and can lead to social consequences for these individuals such as ostracism and loss of employment or other opportunities. As a result, perpetrators of ORD may be more likely to spread negative race-related online content resulting in increased opportunity for exposure to vicarious ORD for African Americans.

The second aim of the study was to explore if racial identity beliefs would moderate the association between ORD experiences and psychological well-being. Findings revealed that vicarious ORD was associated with psychological distress, but only for those with high racial centrality and private regard, and low racial centrality. For those high in racial centrality, it could be that these beliefs improve self-esteem and lead to a positive self-concept (Neblett et al., 2012), which help young adults cope with race-related stress such as vicarious ORD. Additionally, research suggests that private regard may facilitate positive cognitive and emotional responses to

stress (i.e., Brondolo et al., 2009), which may also be related to adaptive coping strategies when faced with stressful experiences such as vicarious ORD. This would be in line with other studies that have shown that self-identification with one's racial-ethnic group and strong feelings of affirmation and belonging (i.e., similar to beliefs measured by racial centrality and private regard, respectively) may protect against experiences of ORD (Tynes et al., 2012). In contrast, these findings suggest that those with low levels of racial centrality may be at increased risk for experiencing psychological distress as a result of vicarious experiences of ORD. This is in line with other findings that have shown that lower levels of ethnic identity are associated with increased reports of psychological distress as a result of ORD (Tynes et al., 2012). It could be that those with low racial centrality may have lower levels of overall self-esteem/self-concept, as well as less positive feelings about the importance of race to their identity. As a result, they may have developed maladaptive coping styles, or may not have developed adaptive coping styles, to adequately cope with race-related stress such as vicarious ORD, which may lead to decreased psychological well-being.

### *Implications*

The current study suggests that some experiences of ORD are associated with psychological distress, and that specific types of racial identity beliefs may either protect against or exacerbate this association. As a result, clinicians and counselors should target these constructs during varying stages of psychotherapy with African American young adults. For instance, during the initial assessment and intake sessions, clinicians should evaluate if experiences of ORD and negative race-related interactions on SNS are sources of stress that are influencing their client's presenting symptoms. Additionally, during this phase, clinicians should assess their client's racial identity beliefs, and discuss with their clients the importance and

significance of the meaning of race to their self-concept. Finally, during psychotherapy, clinicians should be able to help the African American young adult client process and cope with experiences of vicarious ORD (i.e., police shootings), as well as bolster positive racial identity beliefs (i.e., private regard) as a means of coping with these negative experiences online.

These findings also may influence future policy changes that can be made to reduce the experience of individual and vicarious experiences of ORD. More recently, SNS such as Facebook have implemented changes in their policies to reduce the rise of White nationalism and racism by White extremist groups on their platform. Given the link between experiences of ORD and psychological well-being among African American young adults, other SNS platforms should also improve their terms of use to limit the spread of negative race-related content and enforce policies to address experiences of individual ORD.

#### *Limitations and Future Directions*

Very few studies have explored ORD, racial identity beliefs, and psychological well-being among African American young adults, so this study adds several unique contributions to this burgeoning topic in the field. Despite this, there are some limitations that must be noted. First, given that the data were drawn from the final wave of a three-year longitudinal study, the current study suffers from a small sample size that was the result of attrition across five waves of data collection efforts. Yet, post-hoc power analyses (Soper, 2019) for all multiple regression models and predictors of interest ranged from .95 to .99, which exceeds the standard requisite power of .80 (Cohen, 1988; Cohen, Cohen, West, & Aiken, 2003). In other words, the current study's sample size was adequate enough to explore the questions and variables of interest. Still, these results should be interpreted with caution and these findings should only be considered preliminary.



Second, these findings may not generalize beyond the current sample given that data were drawn from a single geographic location, and comprised of majority females from a large PWI (predominately White institution). It is unclear how individual and vicarious experiences of ORD may affect African American young adults who are not college students or who may not reside on a college campus (i.e., community college students). Similarly, African American young adults from a historically Black college or university (HBCU) may have stronger levels of positive racial identity beliefs, and may be more exposed to positive race-related content and messages both offline and online. As a result, future studies should explore these associations in a larger, more representative sample of African American young adults.

Finally, although not examined in this study, racial composition of one's SNS may influence associations between ORD, racial identity, and psychological distress. For example, having a predominately Black SNS network may lead to increased exposure to positive online race-related online content, which may lead to higher levels of private regard and racial centrality. A predominately Black SNS network may be related to decreases in individual ORD, whereas a predominately White or mixed-race SNS network may be related to increases in individual and vicarious ORD. Interestingly, having a predominately Black SNS network may also be related to increased risk for experiencing vicarious ORD, as same-race peers may spread negative race-related online content (i.e., reposting traumatic police shootings or other experiences of discrimination) to raise awareness of ongoing sociopolitical issues or events. Taken together future studies should examine the interrelations between racial composition of one's SNS, racial identity beliefs, and ORD to further explore these associations.

## **Conclusion**

The current study sought to contribute to the burgeoning literature on the impact of ORD on the psychological well-being of African American young adults. The findings suggest that vicarious experiences of ORD are related to psychological distress, and that high levels of racial centrality and private regard may protect against these experiences and are associated with better psychological well-being. Furthermore, these findings suggest that those with low levels of racial centrality may be at increased risk for psychological distress as a result of vicarious experiences of ORD. Though the current study did not find any associations between individual ORD and psychological well-being, future studies should utilize larger, more heterogeneous samples of African American young adults to better elucidate these complex relationships. In the end, the current study highlights the importance of exploring novel forms of race-related stress on the psychological well-being of African American young adults.

## REFERENCES

- Almeida, D. M., Neupert, S. D., Banks, S. R., & Serido, J. (2005). Do daily stress processes account for socioeconomic health disparities? *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, *60*, 34–39.  
[http://dx.doi.org/10.1093/geronb/60.Special\\_Issue\\_2.S34](http://dx.doi.org/10.1093/geronb/60.Special_Issue_2.S34)
- Banks, K. H., & Kohn-Wood, L. P. (2007). The Influence of Racial Identity Profiles on the Relationship Between Racial Discrimination and Depressive Symptoms. *Journal of Black Psychology*, *33*(3), 331–354. <https://doi.org/10.1177/0095798407302540>
- Barry, C. T., Sidoti, C. L., Briggs, S. M., Reiter, S. R., & Lindsey, R. A. (2017). Adolescent social media use and mental health from adolescent and parent perspectives. *Journal of Adolescence*, *61*, 1–11. <https://doi.org/10.1016/j.adolescence.2017.08.005>
- Brondolo, E., Ver Halen, N. B., Pencille, M., Beatty, D., & Contrada, R. J. (2009). Coping with racism: A selective review of the literature and a theoretical and methodological critique. *Journal of Behavioral Medicine*, *32*(1), 64–88. <https://doi.org/10.1007/s10865-008-9193-0>
- Brusilovskiy, E., Townley, G., Snethen, G., & Salzer, M. S. (2016). Social media use, community participation and psychological well-being among individuals with serious mental illnesses. *Computers in Human Behavior*, *65*, 232–240.  
<https://doi.org/10.1016/j.chb.2016.08.036>
- Castle, K., Conner, K., Kaukeinen, K., & Tu, X. (2011). Perceived Racism, Discrimination, and Acculturation in Suicidal Ideation and Suicide Attempts among Black Young Adults. *Suicide and Life-Threatening Behavior*, *41*(3), 342–351.
- Clark, R., Anderson, N. B., Clark, V. R., & Williams, D. R. (1999). Racism as a stressor for African Americans. A biopsychosocial model. *The American Psychologist*, *54*(10), 805–816. <https://doi.org/10.1037/0003-066X.54.10.805>
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences* (2nd Edition). Hillsdale, NJ: Lawrence Earlbaum Associates.
- Cohen, J., Cohen, P., West, S.G., and Aiken, L.S. (2003). *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences* (3rd edition). Mahwah, NJ: Lawrence Earlbaum Associates.
- Derogatis, L. R. (2000). Brief Symptom Inventory 18. Minneapolis: National Computer Systems.
- Doherty, E.E., Green, K.M., Reisinger, H.S., & Ensminger, M.E. (2008). Long-term patterns of drug use among an urban African American cohort: The role of gender and family. *Journal of Urban Health*, *85*, 250-267.

- García Coll, C., Lamberty, G., Jenkins, R., Mcadoo, H. P., Coll, C. G., Jenkins, R., & Mcadoo, H. P. (1996). An Integrative Model for the Study of Developmental Competencies in Minority Children Keith Crnic , Barbara Hanna Wasik and Heidie Vázquez García  
Published by : Wiley on behalf of the Society for Research in Child Development Stable  
URL : <http://www.jstor>. *Child Development*, 67(5), 1891–1914.
- Gil, A.G., Vega, W.A., & Turner, R.J. (2002). Early and mid-adolescence risk factors for later substance abuse by African Americans and European Americans. *Public Health Reports*, 117, S15-S29
- Glaser J., Kahn, K. (2005). Prejudice, discrimination, and the Internet. In *The Social Net: Understanding Human Behavior in Cyberspace*, ed. Y Amichai-Hamburger, pp. 247–74. Oxford, UK: Oxford Univ. Press
- Graham, J. R., Sorenson, S., & Hayes-Skelton, S. A. (2014). Enhancing the cultural sensitivity of cognitive behavioral interventions for anxiety in diverse populations. *The Behavior Therapist*, 37(5), 101–108.
- Hardy, B. W., & Castonguay, J. (2018). The moderating role of age in the relationship between social media use and mental well-being: An analysis of the 2016 General Social Survey. *Computers in Human Behavior*, 85, 282–290. <https://doi.org/10.1016/j.chb.2018.04.005>
- Hurd, N. M., Varner, F. A., Caldwell, C. H., & Zimmerman, M. A. (2014). Does perceived racial discrimination predict changes in psychological distress and substance use over time? An examination among Black emerging adults. *Developmental Psychology*, 50(7), 1910–1918. doi:10.1037/a0036438
- Ilakkuvan, V., Johnson, A., Villanti, A. C., Evans, W. D., & Turner, M. (2018). Patterns of Social Media Use and Their Relationship to Health Risks Among Young Adults. *Journal of Adolescent Health*, 64, 158–164. <https://doi.org/10.1016/j.jadohealth.2018.06.025>
- Keum, B. T. H., & Miller, M. J. (2017). Racism in digital era: Development and initial validation of the perceived online racism scale (PORS v1.0). *Journal of Counseling Psychology*, 64(3), 310–324. <https://doi.org/10.1037/cou0000205>
- Kiecolt, J. K., & Hughes, M. (2017). Racial identity and the quality of life among blacks and whites in the U.S. *Social Science Research*, 67, 59–71. <https://doi.org/10.1016/j.ssresearch.2017.08.008>
- Lampe, C., Ellison, N., & Steinfield, C. (2006). A face(book) in the crowd: Social searching vs. social browsing. *CSCW'06: Proceedings of the 2006 20th Anniversary Conference on Computer Supported Cooperative Work* (pp. 167–170). New York, NY: ACM Press.
- Lee, D. L., & Ahn, S. (2013). The relation of racial identity, ethnic identity, and racial socialization to discrimination-distress: a meta-analysis of Black Americans. *Journal of Counseling Psychology*, 60(1), 1–14. <https://doi.org/10.1037/a0031275>

- Lewis, T. T., Cogburn, C. D., & Williams, D. R. (2015). *Self-Reported Experiences of Discrimination and Health: Scientific Advances, Ongoing Controversies, and Emerging Issues*. *Annual Review of Clinical Psychology* (Vol. 11). <https://doi.org/10.1146/annurev-clinpsy-032814-112728>
- Martin, P. P., Wout, D., Nguyen, H., Sellers, R. M., & Gonzalez, R. (2010). *Investigating the psychometric properties of the multidimensional inventory of Black identity in two samples: The development of the MIBI-S*. Unpublished manuscript
- Masten, A. S., Cutuli, J. J., Herbers, J. E., & Reed, M. J. (2009). Resilience in development. In S. J. Lopez & C. R. Snyder (Eds.), *Oxford handbook of positive psychology* (2nd ed., pp. 117–131). New York: Oxford University Press.
- Neblett, E. W., Hudson Banks, K., Cooper, S. M., & Smalls-Glover, C. (2013). Racial identity mediates the association between ethnic-racial socialization and depressive symptoms. *Cultural Diversity & Ethnic Minority Psychology, 19*(2), 200–7. <https://doi.org/10.1037/a0032205>
- Neblett, E. W., Rivas-Drake, D., & Umaña-Taylor, A. J. (2012). The Promise of Racial and Ethnic Protective Factors in Promoting Ethnic Minority Youth Development. *Child Development Perspectives, 6*(3), 295–303. <https://doi.org/10.1111/j.1750-8606.2012.00239.x>
- Oney, C. N., Cole, E. R., & Sellers, R. M. (2011). Racial Identity and Gender as Moderators of the Relationship Between Body Image and Self-esteem for African Americans. *Sex Roles, 65*(7), 619–631. <https://doi.org/10.1007/s11199-011-9962-z>
- Radovic, A., Gmelin, T., Stein, B. D., & Miller, E. (2017). Depressed adolescents' positive and negative use of social media. *Journal of Adolescence, 55*, 5–15. <https://doi.org/10.1016/j.adolescence.2016.12.002>
- Rivas-Drake, D., Seaton, E. K., Markstrom, C., Quintana, S., Syed, M., Lee, R. M., ... Sellers, R. M. (2014). Ethnic and Racial Identity in Adolescence: Implications for Psychosocial, Academic, and Health Outcomes. *Child Development, 85*(1), 40–57. <https://doi.org/10.1111/cdev.12200>
- Rollins, J., McCusker, M., Carlson, J., & Stroll, J. (2017). Manuscript matcher: A content and bibliometrics-based scholarly journal recommendation system. *CEUR Workshop Proceedings, 1823*, 18–29. <https://doi.org/10.1016/j.chb.2016.11.013>
- Schmitz, N., Hartkamp, N., & Franke, G. H. (2000). Assessing Clinically Significant Change: Application to the SCL-90-R. *Psychological Reports, 86*(1), 263-274.
- Seaton, E. K. (2009). Perceived racial discrimination and racial identity profiles among African American adolescents. *Cultural Diversity & Ethnic Minority Psychology, 15*(2), 137–144. <https://doi.org/10.1037/a0015506>

- Sellers, R. M., Caldwell, C. H., Schmeelk-Cone, K. H., Marc, A., & Zimmerman, M. A. (2003). Racial Identity, Racial Discrimination, Perceived Stress, and Psychological Distress among African American Young Adults. *Journal of Health and Social Behavior*, *44*(3), 302–317. <https://doi.org/10.2307/1519781>
- Sellers, R. M., Chavous, T. M., & Cooke, D. Y. (1998). Racial ideology and racial centrality as predictors of African American college students' academic performance. *Journal of Black Psychology*, *24*(1), 8–27. doi:10.1177/00957984980241002
- Sellers, R. M., Rowley, S. A. J., Chavous, T. M., Shelton, J. N., & Smith, M. A. (1997). Multidimensional Inventory of Black Identity: A preliminary investigation of reliability and construct validity. *Journal of Personality and Social Psychology*, *73*(4), 805–815. <https://doi.org/10.1037/0022-3514.73.4.805>
- Sellers, R. M., & Shelton, J. N. (2003). The role of racial identity in perceived racial discrimination. *Journal of Personality and Social Psychology*, *84*(5), 1079–1092. <https://doi.org/10.1037/0022-3514.84.5.1079>
- Sellers, R. M., Smith, M. A., Shelton, J. N., Rowley, S. A. J., & Chavous, T. M. (1998). Multidimensional model of racial identity: A Reconceptualization of African American racial identity. *Personality and Social Psychology Review*, *2*(1), 18–39. <https://doi.org/10.1207/s15327957pspr0201>
- Smith, A. & Anderson, M. (2018). Social Media Use in 2018. *Pew Research Center*. Available from <https://www.pewinternet.org/2018/03/01/social-media-use-in-2018/>
- Smith, T. B., & Silva, L. (2011). Ethnic identity and personal well-being of people of color: a meta-analysis. *Journal of Counseling Psychology*, *58*(1), 42. <https://doi.org/10.1037/a0021528>
- Soper, D.S. (2019). Post-hoc Statistical Power Calculator for Multiple Regression [Software]. Available from <http://www.danielsoper.com/statcalc>
- Tynes, B. M., Del Toro, J., & Lozada, F. T. (2015). An Unwelcomed Digital Visitor in the Classroom: The Longitudinal Impact of Online Racial Discrimination on Academic Motivation. *School Psychology Review*, *44*(4), 407–424. <https://doi.org/10.17105/SPR-15-0095.1>
- Tynes, B. M., Giang, M. T., Williams, D. R., & Thompson, G. N. (2008). Online Racial Discrimination and Psychological Adjustment Among Adolescents. *Journal of Adolescent Health*, *43*(6), 565–569. <https://doi.org/10.1016/j.jadohealth.2008.08.021>
- Tynes, B. M., & Markoe, S. L. (2010). The role of color-blind racial attitudes in reactions to racial discrimination on social network sites. *Journal of Diversity in Higher Education*, *3*(1), 1–13. <https://doi.org/10.1037/a0018683>

- Tynes, B., Reynolds, L., & Greenfield, P. M. (2004). Adolescence, race, and ethnicity on the Internet: A comparison of discourse in monitored vs. unmonitored chat rooms. *Journal of Applied Developmental Psychology, 25*(6 SPEC. ISS.), 667–684. <https://doi.org/10.1016/j.appdev.2004.09.003>
- Tynes, B. M., Rose, C. A., & Markoe, S. L. (2013). Extending campus life to the Internet: Social media, discrimination, and perceptions of racial climate. *Journal of Diversity in Higher Education, 6*(2), 102–114. <https://doi.org/10.1037/a0033267>
- Tynes, B. M., Rose, C. A., & Williams, D. R. (2010). The Development and Validation of the Online Victimization Scale for Adolescents. *Cyberpsychology: Journal of Psychological Research on Cyberspace, 4*(2), 1–15. Retrieved from <http://cyberpsychology.eu/view.php?cisloclanku=2010112901&article=1>
- Tynes, B. M., Umaña-Taylor, A. J., Rose, C. A., Lin, J., & Anderson, C. J. (2012). Online racial discrimination and the protective function of ethnic identity and self-esteem for African American adolescents. *Developmental Psychology, 48*(2), 343–355. <https://doi.org/10.1037/a0027032>
- Vannucci, A., Flannery, K. M., & Ohannessian, C. M. C. (2017). Social media use and anxiety in emerging adults. *Journal of Affective Disorders, 207*(October 2016), 163–166. <https://doi.org/10.1016/j.jad.2016.08.040>
- Umaña-Taylor, A. J. (2016). A Post-Racial Society in Which Ethnic-Racial Discrimination Still Exists and Has Significant Consequences for Youths' Adjustment. *Current Directions in Psychological Science, 25*(2), 111–118. <https://doi.org/10.1177/0963721415627858>
- Yip, T. (2018). Ethnic/Racial Identity—A Double-Edged Sword? Associations With Discrimination and Psychological Outcomes. *Current Directions in Psychological Science, 27*(3), 170–175. <https://doi.org/10.1177/0963721417739348>

## **STUDY 2: Racial Identity Changes Over Time: Examining Changes in Stable Racial Identity Dimensions and their Association with Psychological Distress using the Multidimensional Model of Racial Identity**

Researchers have noted that racial identity – the personal significance and meaning of race (Sellers, Smith, Shelton, Rowley, & Chavous, 1998) – may serve as a protective factor against the impact of racism-related stress on well-being for African American young adults. For instance, it may enhance youths’ self-concepts and cognitive-appraisal, as well as facilitate their development of adaptive coping strategies (Neblett, Rivas-Drake, & Umaña-Taylor, 2012). The Multidimensional Model of Racial Identity (MMRI; Sellers et al., 1998) has been a valuable conceptualization of racial identity that helps explore how various racial identity beliefs and attitudes influence behavior. Several studies using the MMRI have examined racial identity as a resilience factor in the context of racial discrimination (Banks & Kohn Wood, 2007; Burrow & Ong, 2010), but relatively fewer studies (e.g., Hurd, Sellers, Cogburn, Butler-Barnes, & Zimmerman, 2013; Sellers, Caldwell, Schmeelk-Cone, & Zimmerman, 2003) have examined direct or indirect links (e.g., Caldwell, Zimmerman, Bernat, Sellers, & Notaro, 2002; Hurd et al., 2013; Settles, Navarette, Pagano, Abdou, & Sidanius, 2010) between Black racial identity and psychological well-being. With a few exceptions, the majority of these studies are cross-sectional and conducted with adolescent samples (e.g., Caldwell, Sellers, Bernat, & Zimmerman, 2004; Seaton & Carter, 2018). To address these limitations, this study examined the psychological sequelae of African American young adults’ beliefs about the significance and meaning of race in a sample of African American young adults during the transition to adulthood.



## **Developmental Significance**

Emerging adulthood (Arnett, 2000) represents a significant developmental period for African American racial identity development. Studies suggest that African American emerging adults are still developing (i.e., exploring and/or committing to) their racial identity during this period (e.g., Rowley, Chavous, & Cooke, 2003; Scottham, Cooke, Sellers, & Ford, 2010; Yip, Seaton, & Sellers, 2006). On one hand, in light of the salience of race in the U.S., developing a stable racial identity during emerging adulthood may be a normative task for African Americans (Scottham et al., 2010). On the other hand, the developmental task of constructing a healthy identity may be an area of increased stress for this group, evidenced by increased substance use and suicide risk, as they grapple with the significance and meaning of an identity that is commonly devalued in society (Hurd et al., 2013). For example, as compared to adolescents and adults, African American college students who had not resolved their racial-ethnic identity (evidenced by fewer positive feelings about being African American, for example) were more likely to endorse higher levels of depressive symptoms (Yip et al., 2006). Importantly, this difference in identity status and mental health outcomes was not true for adolescents or older adults. Furthermore, African American college students who have committed to their racial identity reported higher levels of positive feelings about being African American and that race was important to their self-concept (Scottham et al., 2010). Taken together, racial identity and developmental research suggests that racial identity beliefs during this developmental period may influence psychological outcomes and well-being for African American young adults.

## **Racial Identity Development**

Several seminal models have explored the process of racial identity changes and development within African American young adults. Cross's (1971, 1991) racial identity models

describe the process of becoming Black over five stages, beginning with attitudes that degrade Blackness (*pre-encounter*) and culminating in positive, secure feelings about being Black and a resolution of anti-White sentiments (*internalization*). Similar models have either advanced Cross's Nigrescence theory for use in applied settings (e.g., the Psychodiagnostic Model of Racial Identity Development; Helms, 1990), or have proposed different stages that describe how African American young adults develop racial identity beliefs (i.e., Black Identity Development; Jackson, 1976) or the process of exploring and committing to one's ethnic identity (i.e., Ethnic Identity Development; Phinney, 1989). Though these earlier conceptualizations of racial identity have been key in setting the foundation of racial identity research, a more recent model, specifically the Multidimensional Model of Racial Identity (Sellers et al., 1998), has been particularly valuable in further exploring the meaning and significance of race within African Americans.

### **The Multidimensional Model of Racial Identity**

The MMRI conceptualizes racial identity as the significance and qualitative meaning that race has in the self-concepts of African Americans (Sellers et al., 1998). Although other models of racial identity assume that it develops over time (e.g., Cross, 1991; Phinney, 1992), the MMRI focuses on the "status of an individual's racial identity" (Sellers et al., 1998, p. 24). The MMRI consists of four dimensions that refer to the significance and qualitative meaning race has in African Americans' self-concepts: *salience*, *centrality*, *regard*, and *ideology*. *Salience* (not examined in this study) measures the extent to which individuals' races are relevant to their self-concepts during a specific moment, whereas *centrality* corresponds to the extent to which individuals define themselves according to their race over time and across situations (Sellers et

al., 1998). Both salience and centrality measure the significance individuals attach to being Black.

Additionally, *regard*, which measures the extent to which individuals feel positively about their race, and *ideology*, which measures individuals' beliefs, attitudes, or opinions about how they feel people from their race should act, reflect the perceptions one has about the meaning of being Black or African American (Sellers et al., 1998). Racial regard consists of two sub-dimensions: *public regard* and *private regard*. Public regard refers to the extent individuals feel that others view African Americans positively or negatively. Private regard measures the extent to which individuals feel positively or negatively about being African American and about other African Americans. Finally, Sellers et al. (1998) describe ideology as consisting of four sub-dimensions: (1) *assimilationist* (which stresses the similarities between African Americans and American society); (2) *humanist* (which refers to the view that all humans, regardless of racial/ethnic background, are similar); (3) *oppressed minority* (which emphasizes the commonalities between the oppression that African Americans share with other minority groups); and (4) *nationalist* (characterized by views that the African American experience is unique).

Several assumptions undergird the MMRI (Sellers et al., 1998). First, racial identity beliefs are assumed to be both situationally influenced as well as stable/trait like properties of the individual (i.e., racial centrality, racial regard, and racial ideology). Second, the model assumes that individuals have a variety of identities, that these identities are hierarchically ordered, and that a person's own perception of their racial identity is the most accurate indicator of their identity. Finally, as stated earlier, in contrast to stage models of racial identity, the MMRI focuses on the *status* of an individual's racial identity. By focusing on the status of one's racial

identity, the model is able to provide a more textured view of the content of an individual's racial identity beliefs, thereby providing a more detailed view of the heterogeneity in the meaning that African Americans prescribe to being a member of their race. These assumptions allow for us to not only better examine how racial identity beliefs may predict behavior, but also understand how multidimensional profiles of racial identity may influence psychological health outcomes.

### **Racial Identity and Psychological Well-Being**

Mental illness and psychological distress contribute to 90% of suicides, and research is beginning to suggest that African American young adults are more likely to attempt suicide as compared to their White counterparts (U.S. Department of Health and Human Services Office of Minority Mental Health, 2016). As a result, it is imperative that we begin to explore how sociocultural protective factors that may reduce psychological distress among this group are related to overall psychological well-being. One such protective factor, racial identity, has been related to a variety of psychological outcomes (e.g., Neville & Lilly, 2000), and theoretical and empirical work has explored the links between the dimensions of the MMRI and positive psychological outcomes (e.g., Brondolo, Ver Halen, Pencille, Beatty, & Contrada, 2009; Lee & Ahn, 2013; Rivas-Drake et al., 2014). In literature examining African American young adults, racial centrality has been related to both higher (e.g., Caldwell et al., 2002) and lower levels of psychological distress, overall stress, body dissatisfaction, and alcohol use (Brody, Yu, Miller, & Chen, 2015; Caldwell et al., 2004; Lee & Ahn, 2013; Oney, Cole, & Sellers, 2011; Sellers et al., 2003). In terms of racial regard, studies find that private regard is negatively associated with depressive and anxiety symptoms and overall psychological distress (Brondolo et al., 2009; Bynum, Best, Barnes, & Burton, 2008; Hurd et al., 2013; Lee & Ahn, 2013; Neblett, Banks, Cooper, & Smalls-Glover, 2013). Similarly, higher levels of private regard have been associated

with higher self-esteem and body satisfaction, and lower levels of alcohol use (Caldwell et al., 2004; Oney et al., 2011; Rowley, Sellers, Chavous, & Smith, 1998).

Studies examining public regard and psychological outcomes for African American emerging adults find that *lower* levels of public regard protect against distress caused by discrimination and are associated with lower levels of psychological distress (Sellers & Shelton, 2003), while *higher* scores have been associated with *increased* depressive symptoms (Hurd et al., 2013). Few studies have examined direct links between racial ideology and psychological well-being independent of racial discrimination, but nationalist ideology has been found to protect against the psychological distress caused by racial discrimination (e.g. Sellers, Chavous, & Cooke, 1998; Sellers & Shelton, 2003). Racial identity beliefs may influence self-concept (e.g., self-esteem), discrimination attributions (e.g., attributing negative experiences to one's self and not racial discrimination) and coping behaviors (Neblett et al., 2012), but more work is needed to examine direct associations between racial ideology and psychological well-being over time.

### **Limitations and Current Study**

Although several studies have examined links between African American racial identity and psychological well-being using other models of racial identity (e.g., Neville & Lily; Yip et al., 2006), or in adolescent (e.g., Caldwell et al., 2002; Rogers, Scott, & Way, 2015; Seaton & Carter, 2018) and adult (Hardeman et al., 2016; Settles et al., 2010) samples, only a handful of studies using the MMRI have examined direct links between these constructs, independent of racial discrimination, over time (e.g., Hurd et al., 2013; Sellers et al., 2003). The dearth of longitudinal studies examining direct links between racial identity and psychological well-being is an important gap in the literature for several reasons. First, there are inconsistencies across

theories that racial identity beliefs and attitudes are stable across situations and time (Sellers et al., 1998) and empirical evidence using developmental and content/status models that racial identity both changes (Syed & Azmitia, 2009) and does not change (Hurd et al., 2013). Second, the immediate impact of racial identity, whether changing or not, and its development on *changes* in psychological functioning is not well known.

To begin to address these limitations, this study examined changes in racial identity and psychological distress in a sample of African American college students using five waves of data collected over three years. We sought to explore if racial identity dimensions that are proposed to be stable change over time and whether there is individual variation in rates of change. Despite the few previous studies that suggest that dimensions of the MMRI remain relatively stable during the transition to adulthood for African Americans (i.e., Hurd et al., 2013), we hypothesized that initial levels (intercepts) and changes (slope) in racial centrality, racial regard, and racial ideology dimensions of racial identity, as well as variance in the intercepts and slopes would be significantly different from zero. We also sought to explore if initial levels and changes in racial identity dimensions predicted changes in psychological distress over time. We hypothesized that both initial levels and changes in racial identity dimensions would be related to changes in distress from psychological symptoms over time. More specifically, we hypothesized that some racial identity beliefs would be associated with lower levels of psychological distress over time (i.e., high initial levels of private regard), whereas others may be related to higher levels of psychological distress over time (i.e., high initial levels of public regard). This prediction would be in line with other research that suggests that in some contexts, high private regard is associated with lower levels of depressive symptoms over time, whereas high levels of

public regard is associated with higher levels of depressive symptoms over time for African American emerging adults (Hurd et al., 2013).

## **Method**

This study is part of a larger longitudinal research project on African American health and life experiences. Data were collected in five waves over three years from two cohorts of first-year students beginning in the fall of 2013. There was a semester-interval of approximately eight months between waves.

### **Participants**

Participants were African American college students attending a predominantly White Institution in the southeastern United States. In order to participate, participants were required to be at least 18 years of age and self-identify as African American. Participants were 171 students: 118 females (69%) and 53 males, with a mean age of 18.4 (SD = .51) at Wave 1. The median highest maternal educational attainment was “Bachelors or 4-year college degree.” Self-reported family socioeconomic status was reported as: 7.0% poor, 19.3% working class, 50.9% middle class, 22.2% upper middle class, and .6% wealthy. Additionally, 28.7% ( $n = 49$ ) of our sample self-identified as first-generation college student, and 29.8% ( $n = 51$ ) reported being from a single-parent home.

### **Measures**

**Racial Identity.** Racial identity was assessed using The Multidimensional Inventory of Black Identity (MIBI-S; Martin et al., 2010). The MIBI-S is a self-report measure used to assess three dimensions of racial identity: centrality, regard, and ideology. Participants were asked to respond to each of the items using a 7-point Likert-type rating scale from 1 = *strongly* disagree to 7 = *strongly* agree. Specifically, *racial centrality* assessed the extent to which an individual

believes race is a central aspect of their identity (e.g., “I have a strong sense of belonging to Black people”); 4 items; Wave 1:  $\alpha = .74$ ; Wave 2:  $\alpha = .68$ ; Wave 3:  $\alpha = .70$ ; Wave 4:  $\alpha = .79$ ; Wave 5:  $\alpha = .83$ ). *Racial regard* assesses the degree to which an individual feels positively towards one’s racial group (e.g., “I feel good about Black people”; private regard; 3 items; Wave 1:  $\alpha = .80$ ; Wave 2:  $\alpha = .87$ ; Wave 3:  $\alpha = .87$ ; Wave 4:  $\alpha = .89$ ; Wave 5:  $\alpha = .77$ ) and how an individual believes others view Blacks (e.g., “Overall, Blacks are considered good by others”; public regard; 4 items; Wave 1:  $\alpha = .81$ ; Wave 2:  $\alpha = .85$ ; Wave 3:  $\alpha = .81$ ; Wave 4:  $\alpha = .80$ ; Wave 5:  $\alpha = .86$ ). Ideology, or an individual’s beliefs regarding how people from their race should act, was measured using four sub-dimensions: assimilationist philosophy (e.g., “Blacks should strive to integrate all institutions which are segregated”; 4 items; Wave 1:  $\alpha = .73$ ; Wave 2:  $\alpha = .74$ ; Wave 3:  $\alpha = .75$ ; Wave 4:  $\alpha = .77$ ; Wave 5:  $\alpha = .72$ ), humanist philosophy (e.g., “Being an individual is more important than identifying oneself as Black”; 4 items; Wave 1:  $\alpha = .65$ ; Wave 2:  $\alpha = .68$ ; Wave 3:  $\alpha = .61$ ; Wave 4:  $\alpha = .76$ ; Wave 5:  $\alpha = .67$ ); oppressed minority philosophy (e.g., “There are other people who experience racial injustice and indignities similar to Black Americans”; 4 items; Wave 1:  $\alpha = .78$ ; Wave 2:  $\alpha = .65$ ; Wave 3:  $\alpha = .65$ ; Wave 4:  $\alpha = .70$ ; Wave 5:  $\alpha = .66$ ) and nationalist philosophy (e.g., “Blacks would be better off if they adopted Afrocentric values”; 4 items; Wave 1:  $\alpha = .47$ ; Wave 2:  $\alpha = .66$ ; Wave 3:  $\alpha = .74$ ; Wave 4:  $\alpha = .78$ ; Wave 5:  $\alpha = .79$ ). Previous studies have illustrated the construct and predictive validity for the MIBI in large African American college samples with reliability analyses in previous studies producing Cronbach’s alphas that range from .61 to .81 (e.g., Banks & Kohn-Wood, 2007; Seaton, 2009; Sellers, Rowley, Chavous, Shelton, & Smith, 1997).

**Psychological Distress.** Psychological distress was assessed using the Symptom Checklist 90-Revised (Derogatis, 2000). The SCL-90-R is a commonly utilized 90-item self-



report measure designed to screen for a range of psychopathological symptoms of distress. Participants were asked to indicate how much each item from a list of problems had distressed them during the past seven days (0 = *not at all* to 4 = *extremely*). The SCL-90-R consists of 9 subscales (e.g., Obsessive–Compulsive, Depression, Anxiety, Paranoid Ideation, etc.). We utilized the global severity index score as our indicator of overall psychological distress, with higher scores corresponding to increased levels of distress from various psychiatric symptoms, such as anxiety, depression, etc.

### **Procedures**

Following university Institutional Review Board approval, participants were recruited utilizing a list of incoming African American students provided by the university registrar's office. Students were contacted via email and asked to participate in a longitudinal study examining the impact of stressful life experiences on the mental and physical health of African American college students. Eligible participants completed a battery of online and paper and pencil questionnaires in survey administrations lasting approximately one hour. Participants completed the same battery of questionnaires during subsequent waves of data collection. Self-identified racial/ethnic minority research assistants administered the online questionnaires at each time point, and participants received a payment of \$15 for participating in each wave of data collection.

### **Data Analytic Plan**

Latent curve modeling using MPlus 7 was utilized to explore changes in racial identity over time, as well as how changes in racial identity beliefs are related to changes in psychological distress. Specifically, a linear latent growth model for each racial identity variable was estimated and evaluated to determine if racial centrality, racial regard, and racial ideology

beliefs increased or decreased over three years. Next, a linear latent curve model for each racial identity variable predicting changes in psychological distress was estimated. Given the sample size, a separate latent curve model was estimated for each racial identity variable, which resulted in seven latent curve models between the racial identity variables of interest (racial centrality, private regard, public regard, etc.) and psychological distress using five waves of data. Both the intercept and slope factors of psychological distress were regressed on the intercept and slope factors of each racial identity variable, which allowed us to ascertain how initial levels and changes in each racial identity variables were related to the initial levels and changes within psychological distress among the African American young adults in the sample. Finally, latent curve modeling allowed for the testing of reverse causation (i.e., do initial levels of psychological distress predict changes in racial identity variables?).

## **Results**

### **Preliminary Analysis**

Descriptive statistics for the key study variables are summarized in Tables B1 and B2.

### **Changes in Racial Identity Dimensions Over Time**

Latent curve modeling using MPlus 7 revealed that each linear slope model achieved acceptable fits, with CFIs and TLIs greater than .94 and RMSEAs below .07. Results can be found in Table B3. Overall, each linear slope term was significant, which suggests that there were increases in racial centrality, private regard, and nationalist ideology, and decreases in public regard, assimilationist ideology, humanist ideology, oppressed minority ideology, and global psychological distress over five waves of data. Additionally, the variances of all the intercepts and the slope terms for centrality, private regard, nationalist ideology, and

psychological distress, were significant, suggesting variation in the starting levels and rates of change for the noted constructs (i.e., some increased, while others decreased or were constant).

### **Racial Identity and Psychological Distress**

Our models examining the link between racial identity intercept factors and the linear slope factor of psychological distress achieved acceptable fits; CFIs > .90, RMSEAs < .08. The intercept of private regard (Figure B1) predicted the linear slope of global psychological distress (overall model fit:  $\chi^2(53) = 98.93, p < .001$ ; CFI = .92, TLI = .92, RMSEA = .07). Probing the influence of baseline racial identity revealed that higher initial levels of private regard were associated with sharper declines in psychological distress over time ( $\beta = .37, SE = .17, p = .027$ ). The intercept of global distress also predicted the linear slope of private regard (reverse causation;  $\beta = .47, SE = .16, p = .002$ ). As with private regard, the intercept of public regard (Figure B2) predicted the linear slope of global psychological distress (overall model fit:  $\chi^2(57) = 83.21, p = .013$ ; CFI = .95, TLI = .95, RMSEA = .05). Individuals with lower initial levels of public regard experienced greater declines in global psychological distress over time than individuals with higher levels of public regard ( $\beta = .60, SE = .15, p < .001$ ). There was no evidence of reverse causation ( $\beta = .26, SE = .21, p = .213$ ). We did not find any associations between the intercept factors of racial centrality or the ideology scales, or the racial identity slope factors, and the global psychological distress linear slope factor. Finally, gender was associated with the linear slope of global psychological distress. Specifically, being male was associated with greater declines in psychological distress over time (private regard:  $\beta = -.26, SE = .12, p = .025$ ; public regard:  $\beta = -.27, SE = .12, p = .021$ ).

## Discussion

This study aimed to explore changes in racial identity and psychological distress in a sample of African American emerging adults. The first aim of this study was to explore if racial identity dimensions that are proposed to be stable change over time and whether there was individual variation in these changes. Although Sellers and colleagues (1998) noted that these stable properties of racial identity beliefs are likely to change over time, few if any studies have examined how these dimensions change longitudinally. The current study found that racial centrality, private regard, and nationalist ideology increased over time, whereas public regard, assimilationist ideology, humanist ideology, and oppressed minority ideology decreased over time. These results suggest that racial identity dimensions that are proposed and shown to be stable over short periods of time (Sellers et al., 1998; Shelton & Sellers, 2000) may actually change during the transition to adulthood. Whereas other studies have found that dimensions such as racial centrality, private regard, and public regard remain relatively stable during the transition from high school to adulthood for African American emerging adults (Hurd et al., 2013), it could be that as the youth in our study navigate a predominantly White institution, they may be encountering unique situations for the first time (i.e. interpersonal race-related stress) or may be exposed to new experiences (i.e. membership within black student unions or organizations, etc.) that may provoke changes in how they view the meaning and importance of race in their lives.

Our study also highlights that there was significant variability in the rates of change for racial centrality, private regard, and nationalist ideology over three years. This indicates that while on average, African American college students increased in these dimensions, there were individual differences within the sample such that participants beliefs changed at varying speeds,

and some participants decreased in these dimensions over time. Even more striking, we found that there was no significant variability in the rates of changes for public regard, nor assimilationist, humanist, and oppressed minority ideologies. Said another way, over the course of three years, African American college students at a predominately White institution, experience similar rates of decline in how positively they felt others viewed African Americans and in attitudes and beliefs emphasizing similarities between: African Americans and other Americans; African Americans and other oppressed minority groups; and African Americans and all humans.

Although this study does not explore factors that may influence the differences in the rates of change, it could be that this variability (or the lack thereof) is influenced by differences in peer groups, participation in college activities/organizations, or more importantly, differences in the experience of race-related stress. For instance, African American college students continue to report experiencing racial discrimination and microaggressions at different levels at predominately White college campuses (Chao, Mallinckrodt, & Wei, 2012; Hoggard, Byrd, & Sellers, 2015; Nadal, Wong, Griffin, Davidoff, & Sriken, 2014), which may be influencing changes in racial identity beliefs at different rates. Similarly, race-related traumatic events on the national scale (i.e., the death of Trayvon Martin), have also been shown to influence racial identity in a variety of ways (Mason et al., 2017). These experiences of race-related stress for African American college students, both interpersonally on campus and vicariously through exposure to national events, may also explain the lack of variability in regard to decreases in racial identity dimensions such as public regard.

This study also aimed to explore if initial levels and changes in racial identity dimensions predicted changes in psychological distress among African American emerging adults. Very few

studies have investigated the direct links between the dimensions of the MMRI and psychological outcomes among such a sample (e.g., Hurd et al., 2013; Sellers et al., 2003). We first found that higher initial levels of private regard were associated with sharper declines in psychological distress over three years. This would be consistent with extant literature that suggests that private regard beliefs are associated with lower levels of psychological distress (e.g., Lee & Ahn, 2013; Neblett et al., 2012; Bynum et al., 2008). High initial levels of private regard may be associated with higher levels of self-esteem (Oney et al, 2011), which may help African American college students cope with a variety of stressors over time, and therefore may be related to lower levels of psychological distress for this group as they navigate emerging adulthood. Furthermore, others have suggested that private regard may help African Americans not internalize negative stereotypes about being African American that are inherent in U. S. culture (Bynum et al., 2008). This may be particularly important for African American college students at a PWI, as these high initial levels of private regard may help buffer the effects of race-related stress that they may experience as they matriculate through their college/university.

This study also found that African American college students with lower initial levels of public regard experienced greater declines in psychological distress over three years, compared to those individuals with higher initial levels of public regard. This is consistent with previous literature that has shown that *lower* levels of public regard are associated with lower levels of psychological distress (Hurd et al., 2013; Sellers & Shelton, 2003). This may indicate that in terms of public regard, believing that others in society do not feel positively towards African Americans may reduce the harmful impact of race-related stress that college students experience over time, and may therefore be related to lower levels of psychological distress. In fact, others have stated that low public regard beliefs may lead to the development of positive compensatory

strategies, such as utilizing opportunities to speak up about racism and its effects (Neblett & Carter, 2012).

Taken together, these findings inform the original theory of the MMRI and show that the status and content of racial identity beliefs may change over longer periods of time similar to that of developmental models of racial identity (e.g., Cross, 1991; Phinney, 1992). The results further support the assumption that the MMRI may be used to complement developmental models of racial identity. For instance, as individuals navigate stages of racial identity development in a linear fashion, researchers can also observe how dimensions such as private regard, public regard, and racial centrality increase or decrease in response to development and external/contextual factors.

These findings also contribute longitudinal evidence that supports the direct links between racial regard and psychological well-being among African American emerging adults. Racial regard may facilitate higher levels of self-esteem and racial pride, as well as positive cognitive and emotional responses to stress, which may also be related to prosocial coping strategies when faced with stressful experiences. In contrast, we did not find any associations between initial levels of racial centrality or any of the ideology scales and changes in psychological distress over time. For racial ideology, it could be that these beliefs implicate how African American appraise race-related events (Neblett & Carter, 2012), and may not be directly linked to changes in psychological symptoms over time. Our findings differ from many previous studies that have shown racial centrality to be linked to lower levels of psychological distress (i.e., Lee & Ahn, 2013). This may indicate that although racial centrality leads to a positive self-concept (i.e., Sellers et al., 2003), over time, these racial identity beliefs may not be directly linked to changes in psychological symptoms. Overall, our findings highlight the need for future

work to continue using the MMRI to highlight complex and nuanced descriptions of how varying racial identity beliefs influence mental health outcomes over time.

Although there are several strengths associated with the current study, future research should address some limitations of our study. First, we are limited in generalizability since our sample was drawn from a single geographic location and was comprised of majority females. Previous studies have found gender differences in racial identity beliefs (e.g., Oney et al., 2011; Rowley et al., 2003). For example, some have found that African American young adult women may have higher levels of racial centrality and private regard, but lower levels of public regard as compared to their male counterparts (Oney et al., 2011). In contrast, utilizing a profile analytic approach, others have found no differences in racial ideology beliefs between African American young adult men and women (Rowley et al., 2003). Going forward, researchers should aim to utilize a more representative sample in order to better highlight gender differences in changes in racial identity and psychological distress. This is particularly important since our findings suggest that identifying as male was associated with greater declines in psychological distress over time.

Similarly, our sample only consisted of African American college students attending a predominantly White institution (PWI). Future work should explore the experiences of African American college students attending historically Black colleges and universities, as well as African American young adults at other PWIs and in other contexts (e.g., those who are not attending school), to highlight how changes in racial identity may differ depending on the context or environment. Furthermore, there is also evidence that initial levels of psychological distress may predict changes in racial identity beliefs, as we found that initial levels of global psychological distress predicted changes in private regard beliefs. It could be that African



American first-year college students who are experiencing psychological distress may have stronger desires to explore their racial identity and may seek out positive race-related experiences. Taken together, future research should investigate the processes and factors (i.e., exposure to major national events, such as police shootings, the death of Trayvon Martin and other unarmed Black youth, etc.) that influence changes in racial identity and psychological symptoms, in hopes of targeting these factors within a therapeutic or clinical setting to promote positive psychological functioning within African American young adults (i.e., Jones & Neblett, 2016a, 2016b).

This study is among the first to explore longitudinal changes in racial identity beliefs and psychological well-being/psychological distress using the MMRI. Findings suggest that racial identity is a complex and dynamic construct that may change in a variety of ways over time for African American young adults. Our findings also indicate that high initial levels of private regard and low initial levels of public regard are associated with greater declines in psychological distress over three years. It is critical that researchers devote continued attention to exploring the mechanisms that underlie changes in racial identity and psychological well-being (e.g., changes in self-concept, discrimination appraisals, attributions, and coping, etc., Neblett et al., 2012) in hopes of targeting these mechanisms within the context of evidence-based treatments for African Americans.

## REFERENCES

- Almeida, D. M., Neupert, S. D., Banks, S. R., & Serido, J. (2005). Do daily stress processes account for socioeconomic health disparities?. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 60(Special Issue 2), S34-S39.
- Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, 55(5), 469.
- Banks, K. H., & Kohn-Wood, L. P. (2007). The Influence of Racial Identity Profiles on the Relationship Between Racial Discrimination and Depressive Symptoms. *Journal of Black Psychology*, 33(3), 331–354. <https://doi.org/10.1177/0095798407302540>
- Brody, G. H., Yu, T., Miller, G. E., & Chen, E. (2015). Discrimination, racial identity, and cytokine levels among african-american adolescents. *Journal of Adolescent Health*, 56(5), 496–501. <https://doi.org/10.1016/j.jadohealth.2015.01.017>
- Brondolo, E., Ver Halen, N. B., Pencille, M., Beatty, D., & Contrada, R. J. (2009). Coping with racism: A selective review of the literature and a theoretical and methodological critique. *Journal of Behavioral Medicine*, 32(1), 64–88. <https://doi.org/10.1007/s10865-008-9193-0>
- Burrow, A. L., & Ong, A. D. (2010). Racial identity as a moderator of daily exposure and reactivity to racial discrimination. *Self and Identity*, 9(4), 383-402.
- Bynum, M. S., Best, C., Barnes, S. L., & Burton, E. T. (2008). Private regard, identity protection and perceived racism among African American males. *Journal of African American Studies*, 12, 142–155. <https://doi.org/10.1007/s12111-008-9038-5>
- Caldwell, C. H., Sellers, R. M., Bernat, D. H., & Zimmerman, M. A. (2004). Racial identity, parental support, and alcohol use in a sample of academically at-risk African American high school students. *American Journal of Community Psychology*, 34(1-2), 71-82.
- Caldwell, C. H., Zimmerman, M. A., Bernat, D. H., Sellers, R. M., & Notaro, P. C. (2002). Racial identity, maternal support, and psychological distress among African American adolescents. *Child development*, 73(4), 1322-1336.
- Chao, R. C.-L., Mallinckrodt, B., & Wei, M. (2012). Co-occurring presenting problems in African American college clients reporting racial discrimination distress. *Professional Psychology: Research and Practice*, 43(3), 199–207. <https://doi.org/10.1037/a0027861>
- Cross Jr, W. E. (1971). The Negro-to-Black conversion experience. *Black World*, 20(9), 13-27.
- Cross Jr, W. E. (1991). *Shades of Black: Diversity in African-American Identity*. Temple University Press.
- Derogatis, L. R. (2000). Brief Symptom Inventory 18. Minneapolis: National Computer Systems.

- Hardeman, R. R., Perry, S. P., Phelan, S. M., Przedworski, J. M., Burgess, D. J., & Van Ryn, M. (2016). Racial identity and mental well-being: The experience of african american medical students, a report from the medical student CHANGE study. *Journal of Racial and Ethnic Health Disparities*, 3(2), 250-258.
- Helms, J. E. (1990). *Black and White racial identity: Theory, Research, and Practice*. Greenwood Press.
- Hoggard, L. S., Byrd, C. M., & Sellers, R. M. (2015). The Lagged Effects of Racial Discrimination on Depressive Symptomology and Interactions With Racial Identity. *Journal of Counseling Psychology*, 62(2), 216–225. <https://doi.org/10.1037/cou0000069>
- Hurd, N. M., Sellers, R. M., Cogburn, C. D., Butler-Barnes, S. T., & Zimmerman, M. A. (2013). Racial identity and depressive symptoms among Black emerging adults: the moderating effects of neighborhood racial composition. *Developmental Psychology*, 49(5), 938–50. <https://doi.org/10.1037/a0028826>
- Jones, S. C. T., & Neblett, E. W. (2016a). Future Directions in Research on Racism-Related Stress and Racial-Ethnic Protective Factors for Black Youth. *Journal of Clinical Child & Adolescent Psychology*, 4416(May), 1–13. <https://doi.org/10.1080/15374416.2016.1146991>
- Jones, S. C. T., & Neblett, E. W. (2016b). Racial–Ethnic Protective Factors and Mechanisms in Psychosocial Prevention and Intervention Programs for Black Youth. *Clinical Child and Family Psychology Review*, 19(2), 134–161. <https://doi.org/10.1007/s10567-016-0201-6>
- Lee, D. L., & Ahn, S. (2013). The relation of racial identity, ethnic identity, and racial socialization to discrimination-distress: a meta-analysis of Black Americans. *Journal of Counseling Psychology*, 60(1), 1–14. <https://doi.org/10.1037/a0031275>
- Martin, P. P., Wout, D., Nguyen, H., Sellers, R. M., & Gonzalez, R. (2010). *Investigating the psychometric properties of the multidimensional inventory of Black identity in two samples: The development of the MIBI-S*. Unpublished manuscript.
- Mason, T. B., Maduro, R. S., Derlega, V. J., Hacker, D. S., Winstead, B. A., & Haywood, J. E. (2017). Individual differences in the impact of vicarious racism: African American students react to the George Zimmerman trial. *Cultural Diversity and Ethnic Minority Psychology*, 23(2), 174–184. <https://doi.org/10.1037/cdp0000099>
- Nadal, K. L., Wong, Y., Griffin, K. E., Davidoff, K., & Sriken, J. (2014). The Adverse Impact of Racial Microaggressions on College Students' Self-Esteem. *Journal of College Student Development*, 55(5), 461–474. <https://doi.org/10.1353/csd.2014.0051>
- Neblett, E. W., & Carter, S. E. (2012). The Protective Role of Racial Identity and Africentric Worldview in the Association Between Racial Discrimination and Blood Pressure. *Psychosomatic Medicine*, 74(5), 509–516. <https://doi.org/10.1097/PSY.0b013e3182583a50>

- Neblett, E. W., Banks, K.H., Cooper, S. M., & Smalls-Glover, C. (2013). Racial identity mediates the association between ethnic-racial socialization and depressive symptoms. *Cultural Diversity & Ethnic Minority Psychology, 19*(2), 200–7. <https://doi.org/10.1037/a0032205>
- Neblett, E. W., Rivas-Drake, D., & Umaña-Taylor, A. J. (2012). The Promise of Racial and Ethnic Protective Factors in Promoting Ethnic Minority Youth Development. *Child Development Perspectives, 6*(3), 295–303. <https://doi.org/10.1111/j.1750-8606.2012.00239.x>
- Neville, H. A., & Lilly, R. L. (2000). The relationship between racial identity cluster profiles and psychological distress among African American college students. *Journal of Multicultural Counseling and Development, 28*(4), 194-207.
- Oney, C. N., Cole, E. R., & Sellers, R. M. (2011). Racial Identity and Gender as Moderators of the Relationship Between Body Image and Self-esteem for African Americans. *Sex Roles, 65*(7), 619–631. <https://doi.org/10.1007/s11199-011-9962-z>
- Phinney, J. S. (1989). Stages of ethnic identity development in minority group adolescents. *The Journal of Early Adolescence, 9*(1-2), 34-49.
- Phinney, J. (1992). The Multigroup Ethnic Identity Measure: A new scale for use with diverse groups. *Journal of Adolescent Research, 7*(2), 156–176.
- Rivas-Drake, D., Syed, M., Umaña-Taylor, A., Markstrom, C., French, S., Schwartz, S. J., ... Yip, T. (2014). Feeling Good, Happy, and Proud: A Meta-Analysis of Positive Ethnic-Racial Affect and Adjustment. *Child Development, 85*(1), 77–102. <https://doi.org/10.1111/cdev.12175>
- Rogers, L. O., Scott, M. A., & Way, N. (2015). Racial and gender identity among Black adolescent males: An intersectionality perspective. *Child Development, 86*(2), 407-424.
- Rowley, S. J., Chavous, T. M., & Cooke, D. Y. (2003). A person-centered approach to African-American gender differences in racial ideology. *Self and Identity, 2*(May), 287–306. <https://doi.org/10.1080/15298860390232859>
- Scottham, K. M., Cooke, D. Y., Sellers, R. M., & Ford, K. (2010). Integrating process with content in understanding African American racial identity development. *Self and Identity, 9*(1), 19–40. <https://doi.org/10.1080/15298860802505384>
- Seaton, E. K. (2009). Perceived racial discrimination and racial identity profiles among African American adolescents. *Cultural Diversity & Ethnic Minority Psychology, 15*(2), 137–144. <https://doi.org/10.1037/a0015506>
- Seaton, E. K., & Carter, R. (2018). Pubertal timing, racial identity, neighborhood, and school context among Black adolescent females. *Cultural Diversity and Ethnic Minority*

*Psychology*, 24(1), 40.

- Sellers, R. M., Caldwell, C. H., Schmeelk-Cone, K. H., & Zimmerman, M. A. (2003). Racial identity, racial discrimination, perceived stress, and psychological distress among African American young adults. *Journal of Health and Social Behavior*, 302-317.
- Sellers, R. M., Chavous, T. M., & Cooke, D. Y. (1998). Racial ideology and racial centrality as predictors of African American college students' academic performance. *Journal of Black Psychology*, 24(1), 8-27.
- Sellers, R. M., Copeland-Linder, N., Martin, P. P., & L'Heureux Lewis, R. (2006). Racial identity matters: The relationship between racial discrimination and psychological functioning in African American adolescents. *Journal of Research on Adolescence*, 16(2), 187-216. <https://doi.org/10.1111/j.1532-7795.2006.00128.x>
- Sellers, R. M., Rowley, S. A. J., Chavous, T. M., Shelton, J. N., & Smith, M. A. (1997). Multidimensional Inventory of Black Identity: A preliminary investigation of reliability and construct validity. *Journal of Personality and Social Psychology*, 73(4), 805-815. <https://doi.org/10.1037/0022-3514.73.4.805>
- Sellers, R. M., & Shelton, J. N. (2003). The role of racial identity in perceived racial discrimination. *Journal of Personality and Social Psychology*, 84(5), 1079-1092. <https://doi.org/10.1037/0022-3514.84.5.1079>
- Sellers, R. M., Smith, M. A., Shelton, J. N., Rowley, S. A. J., & Chavous, T. M. (1998). Multidimensional model of racial identity: A Reconceptualization of African American racial identity. *Personality and Social Psychology Review*, 2(1), 18-39. <https://doi.org/10.1207/s15327957pspr0201>
- Settles, I. H., Navarrete, C. D., Pagano, S. J., Abdou, C. M., & Sidanius, J. (2010). Racial identity and depression among African American women. *Cultural Diversity and Ethnic Minority Psychology*, 16(2), 248.
- Shelton, J. N., & Sellers, R. M. (2000). Situational Stability and Variability in African American Racial Identity. *Journal of Black Psychology*, 26(1), 27-50. <https://doi.org/10.1177/0095798400026001002>
- Syed, M., & Azmitia, M. (2009). Longitudinal trajectories of ethnic identity during the college years. *Journal of Research on Adolescence*, 19(4), 601-624. <https://doi.org/10.1111/j.1532-7795.2009.00609.x>
- U.S. Department of Health and Human Services Office of Minority Mental Health. (2016). *Mental health and African Americans*. Retrieved from <http://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=24>
- Yip, T., Seaton, E. K., & Sellers, R. M. (2006). African American racial identity across the

lifespan: Identity status, identity content, and depressive symptoms. *Child Development*, 77(5), 1504-1517.

### **STUDY 3: Developing Culturally-Adapted Mobile Mental Health Interventions: A Mixed Methods Approach**

African American young adults suffer from negative mental health symptoms (e.g., depressive and anxiety symptoms) at either similar or greater rates than that of White Americans, yet they are seven times less likely to have access to or receive effective treatments (Agency of Healthcare Research and Quality, 2013). Given that mental illness contributes to 90% of suicides and that African American young adults are more likely to attempt suicide (U.S. Department of Health and Human Services Office of Minority Mental Health, 2016), the disparity in mental health treatments within these communities is a concerning public health issue. Fortunately, mobile-health (mHealth) technology may transform mental health services and address disparities in mental healthcare. mHealth technologies are already being used in a variety of health contexts (i.e., diabetes management), and can take forms ranging from mobile web-based apps or platforms to wearable technologies (i.e., Fitbit watches). A meta-analysis of mHealth for mental health has shown that it can effectively reduce symptoms related to depression, anxiety, and substance use (i.e., Donker et al., 2013).

For mHealth to be effective for African American young adults, it is important that these applications are culturally-adapted to incorporate the unique sociocultural risk and protective factors that influence mental health for this population. Two such sociocultural factors that have a large impact on the mental health of African American young adults are experiences of racial discrimination and racial identity beliefs. For instance, perceived experiences of discrimination are linked to psychological distress (Schmitt, Branscombe, Postmes, & Garcia, 2014). Yet, not

all African Americans who experience racial discrimination are impacted in the same way, and research has shown that racial identity can both protect against experiences of racial discrimination (e.g., Brondolo, Ver Halen, Pencille, Beatty, & Contrada, 2009; Willis & Neblett, 2018), as well as promote better psychological outcomes (i.e., Rivas-Drake et al., 2014).

There is an urgent need for mHealth technology for mental health symptoms for African American young adults. It is imperative that these technologies are culturally adapted so that they address sociocultural factors such as racial discrimination and racial identity beliefs, especially since these factors have been shown to influence perceptions of mental health treatments (i.e., Cheng, Kwan, & Sevig, 2013). In light of these limitations, the current study sought to utilize focus groups of African American young adults to inform the development and design of future culturally-adapted mHealth applications for mental health symptoms.

### **Barriers to Traditional Mental Health Treatments among African American Young Adults**

As stated above, there is a large disparity in the access to and utilization of effective mental health treatments among African American young adults, which may be contributing to rising rates of suicide among this group (A.H.R.Q., 2013; Lasser et al., 2002; U.S.D.H.H.S.O.M.M.H., 2016). Prior to conceptualizing possible solutions to this health disparity, it is important to consider relevant barriers to traditional mental health treatments among this population. Of note, extant literature suggests that disparities in access to care and utilization of effective mental health treatments may stem from a variety of factors, including financial factors (inadequate insurance, low socioeconomic status), stigma, a lack of educational resources about mental health, and a lack of minority providers or providers trained to treat patients from multicultural backgrounds (American Psychological Association, 2014). For example, research has shown that discrimination from providers and the historical experience of



racism have led to a mistrust of mental health providers within African American communities (e.g., A.H.R.Q., 2013). This mistrust usually manifests in the form of misdiagnosis, inadequate treatment, and lack of cultural competence by health care professionals.

In exploring the barriers specific to African American young adults, it has been shown that African American young adults do not view mental health symptoms as chronic, which reduces their likelihood to seek services (i.e., Narendorf, 2018). Additionally, African American young adults are also less open to treatment because they believe that they can self-manage their symptoms (Narendorf, 2018). Finally, compared to other age groups, African American young adults have high levels of stigma related to seeking mental health treatment (DeFreitas, Crone, DeLeon, & Ajayi, 2018). Taken together, these barriers to traditional mental health treatments highlight the urgent need to explore alternative methods to deliver effective mental health treatments to this population.

### **The Promise of mHealth Technologies**

Mobile-health (mHealth) technologies may transform the delivery and utilization of mental health services and address disparities in mental healthcare among African American young adults. Research has shown that mHealth technologies have now been utilized in a variety of health contexts (e.g., diabetes management; Holtz et al., 2017) and have shown positive outcomes (Mulvaney, Anders, Smith, Pittel, & Johnson, 2012). Research has also begun to highlight how mHealth may transform mental health service delivery (Jones, 2014; Kazdin & Blasé, 2011) and can lead to additional benefits when compared to traditional therapy (Musiat & Tarrier, 2014). In fact, in the past decade, several efforts have been made to use mHealth to address negative mental health symptoms such as depressive symptoms, substance use, and bipolar symptoms, or to promote psychological well-being, such as improved coping strategies

and mindfulness (e.g., Bardram et al., 2013; Nicholas, Fogarty, Boydell, & Christensen, 2017; Lane et al., 2011; Kessler et al., 2011; Reid et al., 2012). For instance, Kessler and colleagues (2011) designed an mHealth intervention for mental health symptom assessment and management for adolescents and young adults. In their randomized control trial, they found that the mHealth application led to significant reductions in depression, anxiety, and stress symptoms when compared to an attention control group (Kessler et al., 2011).

Since then, meta-analyses have shown that mHealth for mental health can effectively reduce symptoms related to depression, anxiety, and substance abuse (Donker et al., 2013), as well as promote more adaptive mental health practices (i.e., mindfulness, meditation) and promote better well-being (Lane et al., 2011). In regards to psychotherapy, mHealth for mental health can be used in a variety of ways. For example, some have used mHealth technologies as an added benefit to support and facilitate treatment (Luxton, McCann, Bush, Mishkind, & Reger, 2011), whereas others have used mHealth as the primary intervention for psychological symptoms (Murry, Berkel, & Liu, 2018). Given that mHealth has been shown to be effective for treating psychological symptoms, and given the flexibility of its usage, mHealth technologies may help to address current disparities in access to and utilization of mental health services among African American young adults (U.S.D.H.H.S.O.M.M.H, 2016). Yet, given the associations between sociocultural risk and protective factors and psychological well-being among this population, it is important that mHealth technologies consider how these factors may impact the effectiveness and utilization of these products.

### **Sociocultural Risk and Protective Factors that Influence Psychological Well-Being**

As stated above, in order for mHealth to be effective, it may be important to understand the unique sociocultural risk and protective factors (i.e., racial discrimination and racial identity,

respectively) that influence psychological well-being among African American young adults. First, offline and online racial discrimination experiences are prevalent issues for African American young adults (Chou, Asnaani, & Hoffman, 2012; Keum & Miller, 2017). Studies have shown that African Americans continue to experience more racial discrimination than any other ethnic/racial group in the U.S. (e.g., Chou et al., 2012). Even more alarming, these experiences of discrimination are linked to negative psychological outcomes (i.e., decreased self-esteem and decreased positive outcomes, increased anxiety, depressive symptoms; Schmitt et al., 2014).

In contrast, racial identity beliefs, or the significance and qualitative meaning of race to the self-concept of an individual (Sellers et al., 1998), can both protect against these experiences of discrimination and promote positive psychological outcomes among African American young adults (Brondolo et al., 2009; Rivas-Drake et al., 2014; Willis & Neblett, 2018). More specifically, racial identity beliefs, especially positive feelings about one's race, are positively associated with academic adjustment, well-being, social functioning, and self-esteem, and negatively associated with depressive symptoms, externalizing and internalizing problem behaviors, and health risk outcomes (e.g., Rivas-Drake et al., 2014; Smith & Silva, 2011). Additionally, racial identity pride and belonging may lead to a general sense of well-being and buffer against racism for African Americans, and reduce distress when one is exposed to a negative event that may be a function of discrimination (Brondolo et al., 2009).

### **Limitations of Existing Research**

Given disparities in access to and utilization of mental health treatments among African American young adults, mHealth technology for mental health symptoms may address this health disparity. As mHealth technologies are developed for this population, it is important that they are culturally sensitive to the unique sociocultural risk and protective factors (racial

discrimination and racial identity beliefs, respectively) that influence the psychological well-being of those who identify as members of this group. For example, a study of mHealth created for African American rural families showed that when culturally-adapted mHealth technology is designed, it is just as effective as treatment as usual. This study also suggested that culturally-adapted mHealth may be more effective than traditional treatments as racial-ethnic minorities were more likely to use mHealth than attend in-person sessions (Murry et al., 2018).

Even more importantly, research must understand how sociocultural factors may directly impact the utilization of mHealth technologies. For example, racial discrimination has been linked to higher levels of stigma related to mental health treatments, whereas stronger racial-ethnic identity beliefs have been linked to lower levels of stigma related to mental health treatment seeking (Cheng et al., 2013). Going forward, it will be imperative that future mHealth interventions take into account the associations between racial discrimination, racial identity beliefs, mental health, and mental health treatment seeking attitudes.

Unfortunately, despite the utility of mHealth technologies for treating psychological symptoms, African American young adults are still underrepresented in mHealth research, despite their high ownership of smartphones (Smith & Paige, 2015), and their common use of smartphones to access the Internet (i.e., Zickuhr & Smith, 2012). Doing so limits our understanding of how mHealth should be developed and designed for this group to effectively target disparities in access to and utilization of mental healthcare. Going forward, it is important for researchers to consider methods that incorporate the lived experiences of African American young adults (i.e., focus group interviews) in the design and development of mHealth platforms. This will allow researchers to explore and highlight which features and content are relevant to be included in effective mHealth interventions for this group. Finally, as outlined by Stephan and

colleagues (2017), mHealth development for mental health symptoms should be informed by a review of the literature, including a review of current mHealth for mental health treatment. Yet, as highlighted above, African American young adults are underrepresented in mHealth research, so the effectiveness and acceptability of current mHealth options for psychological symptoms among this group is unknown. Moving forward, researchers should explore if current mHealth technologies for mental health are acceptable for this population in an effort to assess if there is an urgent need for novel, culturally-adapted applications.

### **Current Study**

The current study utilized focus groups of African American young adults to inform the future development and design of culturally-adapted mHealth applications for treating mental health symptoms. The study utilized a mixed-methods approach, in that qualitative (i.e., focus groups) and quantitative (i.e., surveys) methods were used to explore the research questions of interest. With regard to the qualitative research questions, this study explored: 1) what are African American young adults' perceptions of the associations between their racial identity and experiences of discrimination, mental health, and mental health treatment seeking attitudes, 2) what features do African American young adults desire within culturally-adapted mHealth interventions, and 3) how do African American young adults experience and evaluate current mHealth options. Comparatively, utilizing quantitative measures, the current study explored the associations between racial discrimination, racial identity, and attitudes regarding utilizing mHealth interventions.

Researchers have found that the construction of mHealth interventions should be a patient-centered process, and that mHealth interventions are more successful if the intended audience is incorporated in the initial development and design process (Holtz et al., 2017). In

light of these findings, an important feature of this study is that it utilizes a sample of African American young adults to inform the development of future mHealth applications for treating African American mental health.

A mixed methods approach is best in that the focus group narratives were used to provide a safe space for the discussion of experiences of racial discrimination, beliefs about racial identity, and how both factors influence mental health and mental health treatment seeking. Additionally, focus groups allowed for collaborative brainstorming among participants on the most effective features to include in an mHealth intervention for African American young adults. Finally, focus groups allowed for active testing and immediate feedback on the utility of existing mHealth interventions to assess the utility of the creation of novel mHealth applications for this population. Additionally, quantitative measures allowed for the objective exploration of how experiences of racial discrimination and racial identity beliefs influence perceptions of mental health treatments via mHealth.

## **Method**

### **Participants**

Participants were 38 African American young adults recruited from the Chapel Hill, Durham, and Raleigh, North Carolina area. To be eligible to participate, participants had to self-identify as African American, be between the ages of 18 and 25, and have access to and/or own a smartphone. Data were collected over a three-month period during the summer of 2018. Participants included 29 women and 9 men, with an average age of 21. Although each participant identified as African American, 11 participants also identified with other ethnic backgrounds, such as St. Marteen, Pacific Islander, Nigerian, Liberian, Jamaican, and Ghanaian, which represents the heterogeneity of the African American experience and perspectives that were

represented in the study. The majority of participants identified their family's socioeconomic status as Middle Class ( $n = 18$ ), followed by Working Class ( $n = 14$ ), and Upper Middle Class ( $n = 6$ ). All participants were either in college, or had obtained at least a Bachelor's degree. Finally, all participants owned a mobile smartphone and indicated that they used mobile applications "several times a day".

## **Procedure**

Following university Institutional Review Board approval, participants were recruited via university listservs, word-of-mouth, and social media groups (i.e., GroupMe message channels aimed at African American young adults in the aforementioned areas). Eligible participants were randomized into one of twelve mini-focus groups that ranged from three to five participants per group. In general, focus groups allow researchers to highlight contrasting views within subgroups, and they are able to highlight which views are common across groups (i.e., Morgan, 1996). Mini focus groups have the same advantages as larger focus group and were chosen as the ideal focus group format as they more easily mirror the natural dynamics of a conversation between acquaintances and allow for more interactions between participants and in-depth exploration of complex issues, such as mental health (Greenbaum, 2000). Additionally, mini focus groups allow for better control of dominating individuals and the probing of less responsive group members (Greenbaum, 2000).

All groups were conducted in the UNC Department of Psychology and Neuroscience. At each focus group session, research assistants led participants through the informed consent process, and participants completed the quantitative measures via the Qualtrics online survey software as they waited for the focus group session to begin. The quantitative measures included demographic information, as well as surveys that assessed experiences of racial discrimination,

racial identity beliefs, and attitudes towards mHealth technologies for mental health. The primary investigator served as the primary focus group facilitator, and research assistants served as note takers. After introductions and rapport building, the focus groups revolved around a variety of topics and the focus group facilitator followed a semi-structured focus group guide (Appendix C) that was created based on the research questions of interest. Each primary question was also followed by optional probing questions that allowed the focus group leader to go more in-depth on topics that of were particular interest of the group. The focus group guide included some of the following primary questions:

- What is your perception of mental health and mental health treatments?
- What barriers/obstacles get in the way of finding help for mental health?
- Have experiences of discrimination been related to mental health symptoms for you or someone you know?
- If there was an app that promoted mental health in African Americans, what kinds of features should it have?

Finally, at the end of the focus group, each participant evaluated current mHealth applications for mental health that were available on the market to assess the need for a new, culturally-adapted mHealth intervention for this population. Prior to the focus groups, a team of research assistants conducted a literature review and review of the “Apple App Store” and “Android App Store”. Only technologies that targeted mental health and were free to use were selected for the initial review process. From there, each research assistant tested each application and rated them based on ease of use, relevance to mental health, evidence of effectiveness, and cultural relevance. Based on these subcategories and total ratings, the following applications were selected to use for the focus groups: CBTi, Mood Coach, STAIR (all three were selected



due to high ratings on evidence base and/or ease of use; created by the U.S. Department of Veterans Affairs), and the Safe Place (selected for high ratings on cultural relevance; created by Jasmin Pierre). All four applications were available in the “Apple Store”, and eligible participants were instructed to download the applications prior to focus group sessions. Research assistants ensured that each participant had access to each application prior to each focus group, and research assistants had back-up hardware with the applications accessible if participants were unable to download or access the application during the session. Participants were given 10 to 20 minutes to test each application during focus groups, and the final section of the focus group involved the participants providing feedback on the applications. Examples of the questions used to guide the evaluation of these current applications are:

- Which apps did you like the most? The least? Why?
- What features did you like and dislike?
- What would make the apps more accessible to African American young adults?

Sessions lasted on average 90-minutes, and each participant was compensated \$25 at the end of each focus group. The focus group facilitator and research assistants debriefed after each focus group session. Each group was audio-recorded, and later uploaded to a secure network that were later sent to a professional transcription company for verbatim transcription.

## **Quantitative Measures**

**Sociodemographic Information.** Participants reported sociodemographic data, which were used to highlight the characteristics of the participants. This information consisted of gender, age, race/ethnicity, socioeconomic status, and frequency of mobile-app use.

**Experiences of Racial Discrimination.** Experiences of racial discrimination were measured using both the Daily Life Experiences Scale (DLE), a self-report scale to assess past

experiences with offline racial discrimination over the past six months (Harrell, 1994;  $\alpha = .94$ ), and the Online Victimization Scale (OVS; Tynes, Rose, & Williams, 2010;  $\alpha = .82$ ) which was used to assess past experiences with online racial discrimination over the past year. The DLE subscale is a self-report measure of the frequency and bother associated with 18 independent microaggressions participants have experienced due to their race on a scale from 1 = *never happened* to 5 = *once a week or more*. The OVS consist of items assessing both vicarious and individual, or personally-mediated, experiences of ORD, from 1 = *never happened* to 6 = *a daily basis*. Previous studies have illustrated that both measures have reliable and valid psychometric properties within similar samples of African American young adults (e.g., Neblett, Bernard, & Banks, 2016; Seaton, Upton, Sellers, Neblett, & Hammond, 2011; Tynes, Umaña-Taylor, Rose, Lin, & Anderson, 2012; Tynes, Del Toro, & Lozada, 2015).

**Racial Identity Beliefs.** Racial identity beliefs were assessed using a shortened version of the Multidimensional Inventory of Black Identity (MIBI-S; Martin, Wout, Nguyen, Sellers, & Gonzalez, 2008). Responses on the MIBI-S assess the three stable dimensions of Black racial identity put forth by Sellers and colleagues (1998). Specifically, the *Centrality* scale, which consists of four items, measures the extent to which being African American is central to participants' definitions of themselves or self-concept (i.e., "In general, being Black is important to my self-image"). Next, the *Regard* scale is composed of two subscales assessing Public and Private Regard. The *Public Regard* subscale consists of four items that measures the extent to which participants feel that other ethnic/racial groups have positive feelings toward African Americans (i.e., "Overall, Blacks are considered good by others"), whereas the *Private Regard* subscale measures the extent to which participants have positive feelings toward African Americans in general (i.e., "I feel good about Black people) and consists of three items.

The *Ideology* scale is comprised of four subscales: Assimilationist, Humanist, Oppressed Minority, and Nationalist. The *Assimilationist* subscale, which consists of four items, assesses the extent to which participants emphasize the similarities between African Americans and mainstream American culture/systems (i.e. “Blacks should strive to be full members of the American political system”). The *Humanist* subscale, composed of four items, measures the extent to which respondents emphasize the similarities among individuals of all racial-ethnic backgrounds (i.e. “Blacks should judge Whites as individuals and not as members of the White race”). The *Oppressed Minority* subscale, which also consists of four items, measures the extent to which participants emphasize the similarities between African Americans and other ethnic-racial minority groups (i.e. “The racism Blacks have experienced is similar to that of other minority groups”). Finally, the *Nationalist* subscale, which consists of four items, measures the extent to which participants emphasize the uniqueness of being African American or Black (i.e. “Whenever possible, Blacks should buy from other Black businesses”). Participants were asked to respond to each of the items using a 7-point Likert-type rating scale from 1 = *strongly* disagree to 7 = *strongly* agree, and previous studies have illustrated the construct and predictive validity for the MIBI (i.e., Neblett & Carter, 2012).

**mHealth Attitudes.** To assess participants’ attitudes towards mHealth interventions, the primary investigator created a novel scale for the purpose of the study ( $\alpha = .99$ ). The scale consisted of 13 items that assessed three dimensions: participants’ attitudes towards mental health and utilizing mental health treatment, participants’ attitudes towards the appropriateness of utilizing mHealth interventions for treating psychological symptoms, and participants’ desire for culturally-adapted mHealth interventions for mental health. Sample questions included: “It is important to offer mental health services through a mobile-health app”, “A mobile app would be

useful for finding treatment and resources for coping with negative mental health symptoms”, “My mental health is important to me”, and “The African American/Black community would benefit from a mobile mental health app geared towards us”. Each item was rated on a 7-point Likert scale, from 1 = *strongly disagree* to 7 = *strongly agree*.

### **Data Analytic Plan**

**Quantitative Data Analysis.** The quantitative data were explored primarily through descriptive statistics, such as means, standard deviations, and correlational analyses.

**Qualitative Data Analysis.** In order to explore the qualitative data, the data were analyzed using an open coding process as described in studies such as Hudson, Eaton, Banks, Sewell, & Neighbors (2018). First, the primary investigator and research assistants reviewed a subset of the transcripts and debriefing notes. From there, the team created notes, highlighted themes and accompanying texts, and created an initial codebook and an initial list of codes. Codes were created by identifying, coding, and sorting text segments into higher order themes based on patterns in the data (Morgan & Krueger, 1998). From there, the research team met to compare notes and the initial codes and codebook, and resolved any discrepancies, disagreements, or new codes that emerged in the initial codebook creation process. As a result, a final list of codes emerged, and the current author coded the remaining transcriptions.

Finally, thematic analysis was used to identify recurring themes across focus groups (Braun & Clarke, 2006). This study utilized an inductive approach to explore themes, which means the codebook relied on the recorded data from the participants, rather than a priori assumptions or frameworks. The primary investigator explored overarching themes across the focus groups and combined these findings with the quantitative data and extant literature to explore the meaning of the obtained data (Dill et al., 2016). More specifically, recurrent themes

were summarized, revised, mapped, and interpreted to explore the research questions highlighted above (e.g., what features do African American young adults want in a culturally-adapted mHealth intervention).

## Results

### Quantitative Analyses

#### **Offline and online racial discrimination experiences, racial identity variables, and attitudes towards mental health and mHealth treatment.**

Quantitative analyses consisted of examining means, standard deviations, and correlations among offline racial discrimination, individual and vicarious experiences of ORD, racial identity variables, and mental health/mHealth attitudes (Table D1). On average, participants responded that they experienced offline racial discrimination between once and once a month over the past six months ( $M = 2.61$ ,  $SD = 0.93$ ). In terms of individual ORD, participants reported experiencing it between never and once over the past year ( $M = 1.71$ ,  $SD = 0.58$ ). In contrast, they reported that they experienced vicarious ORD between a few times a month and a few times a week over the past year ( $M = 4.20$ ,  $SD = 1.21$ ).

Regarding racial identity, participants reported high levels of private regard ( $M = 6.59$ ,  $SD = 0.67$ ), racial centrality ( $M = 6.01$ ,  $SD = 0.73$ ), assimilationist ideology ( $M = 5.93$ ,  $SD = 0.84$ ), and nationalist ideology ( $M = 5.31$ ,  $SD = 0.70$ ). They also reported moderate levels of oppressed minority ( $M = 4.80$ ,  $SD = 0.92$ ) and humanist ( $M = 4.41$ ,  $SD = 0.77$ ) ideologies. In general, participants reported low levels of public regard ( $M = 3.26$ ,  $SD = 1.01$ ). Finally, regarding attitudes towards mental health and mHealth treatments, participants reported strong positive feelings towards utilizing mental health services ( $M = 6.11$ ,  $SD = 0.75$ ), positive

attitudes towards using mHealth for treating mental health symptoms ( $M = 5.89$ ,  $SD = 0.75$ ), and a strong desire for culturally-adapted mHealth technologies ( $M = 6.35$ ,  $SD = 0.60$ ).

Next, the associations between racial discrimination and attitudes regarding utilizing mHealth interventions were explored using zero-order correlations among these constructs. Of note, more frequent experiences of vicarious ORD were positively associated with a stronger desire for culturally-adapted mHealth interventions for mental health ( $p = 0.32$ ). Offline racial discrimination and individual ORD were not associated with mental health treatment seeking attitudes, attitudes towards using mHealth, or desires for culturally-adapted mHealth. Next, those who felt positively about being African American (i.e., high private regard) and those who emphasized the uniqueness of the Black experience (i.e., high nationalist ideology) were more likely to have positive attitudes towards mental health and mental health treatments ( $p = .02$  and  $p = .004$ , respectively). Furthermore, higher levels of private regard were associated with more positive attitudes towards the appropriateness of utilizing mHealth for mental healthcare ( $p = .006$ ). Higher levels of private regard, as well as nationalist ideology, were also associated with stronger desires for culturally-adapted mHealth applications for mental health ( $p = .05$  and  $p = .03$ ). Moreover, those who emphasized similarities between African Americans and mainstream American culture/systems (i.e., high assimilationist ideology) also tended to have stronger desires for culturally-adapted mHealth applications for mental health ( $p = .01$ ).

### **Qualitative Analyses**

**African American young adults' perceptions of race, race-related stressors, mental health, and mental health treatment seeking attitudes.**

The first qualitative research question explored African American young adults' perceptions of the associations between their racial identity and experiences of discrimination, mental health, and mental health treatment seeking attitudes (Table D2).

***Theme one: “Feeling like everyone expects you to fail is exhausting.”***

First, participants described a variety of unique stressors that African American young adults face that impact their mental health. These experiences included instances of microaggressions and interpersonal discrimination (e.g., negative classroom experiences with professors and peers, police encounters, and discrimination in healthcare settings). Focus groups also highlighted experiences of vicarious discrimination (i.e., witnessing family members experience unfair policing/police brutality, etc.). They often noted that these experiences led to increased hypervigilance in their daily activities (i.e., being “on edge”), feelings of isolation, and other negative emotional reactions (i.e., anger, sadness, frustration). Additionally, participants noted that negative societal standards or stereotypes of what it means to be an African American has negatively impacted their mental health. They discussed their awareness of historical oppression and trauma experienced by African Americans, intersecting negative experiences between their racial, gender, and/or sexual identities (i.e., experiencing the “strong black woman stereotype”, experiencing both racism and homophobia), as well as “tokenism” (i.e., having to represent "all black people" in academic or professional spaces). Similarly, participants noted how expectations about how African Americans should cope with stress impacts their psychological well-being. For example, participants described notions of a “forced resilience”, or being expected to “push through” or cope with stress without succumbing to it (i.e., “You don’t cry, you just bite the bullet”), and these beliefs were related to treatment seeking attitudes:

Participant 7: Yeah I think it's just all about not showing any vulnerabilities in the black community and just trying to set yourself up for or make yourself seem stronger than you

actually may be. Which may be detrimental in the long run because if you don't seek help when you need it the most, then you're gonna become even more vulnerable than you are once you started experiencing any mental health issues.

Participant 8: Yeah, I agree. I think it's just like, you kind of don't wanna show weakness. You wanna show that you can handle yourself and then people kind of take that too far.

Additionally, participants discussed how interracial contexts can also negatively impact mental health. For example, they discussed the pressure of being minoritized or “the only one” in majority White academic and/or professional spaces, and the pressure of “having to work harder because of being a minority” in majority White spaces. More specifically, participants highlighted that environments where there is either a lack of community for African Americans, or a lack of African Americans present, leads to feelings of isolation and exacerbates maladaptive mental health symptoms. Taken together, the above findings highlight the myriad of ways that social and cultural stressors and expectations that are unique to African Americans lead to psychological distress, maladaptive coping symptoms, and feelings of isolation that may impact attitudes towards seeking mental healthcare.

***Theme two: “Being Black is lit.”***

Focus groups also discussed a variety of culturally specific protective factors that contribute to the psychological well-being of African American young adults. Broadly, groups discussed how their racial identity and past experiences of discrimination has led to a feeling of “resiliency” (e.g., feeling optimistic in the face of stressors, increased self-efficacy as a result of overcoming adversities). They described that professional accomplishments contribute to increased psychological well-being in that it often relates to succeeding *despite* negative experiences related to individual, structural, and cultural racism. For instance, one participant stated, “I feel accomplished because there are a lot of barriers...I'm in UNC, and I see other black people here. It makes me feel proud, I feel even better about myself.” Additionally, having



various cultural and ethnic backgrounds from the African diaspora also contributed to positive self-esteem for participants, and many of them noted how being a first-generation African or Caribbean American, in addition to identifying with African American culture, contributed to feelings of increased pride and happiness about being Black in this country.

Focus groups also often discussed how being African American allows for opportunities to experience increased social support from community spaces, such as from churches or in predominately Black spaces and/or social organizations (i.e., feeling connected to other Black young adults due to similar cultural experiences, interests, and beliefs). For instance, these associations are highlighted in this focus group excerpt:

Participant 3: I think just in general the pride in your culture and the pride in your family and even though you face hardships, the fact that you get through them and have community that's trying to encourage you and build you up to get through it together, it's that sense of camaraderie that you get when you walk on a campus like this or NC state or anywhere else and you see another face that looks like you. It's just lit.

Participant 4: It's lit.

Participant 3: And we created America, basically.

The protective function of social support also extended to seeking mental health treatment. For example, participants discussed how they felt as if they received adequate social support regarding seeking mental health treatment and coping with mental health symptoms from their African American young adult peers. They described how friend groups offered a “safe space” to show vulnerability. They also described being encouraged by their peers, and often how friends provided advice and support for seeking mental health services when participants felt unable to talk to their parents or other older adults. Additionally, participants discussed that increased conversations on social media platforms among African American young adults has begun to reduce their perceived stigma around mental health and seeking mental health treatments. Overall, the current findings highlight that past experiences of discrimination and

increased connection and social support from same-race peers can lead to increased feelings of racial pride or positive feelings about being Black, which are also linked to overall psychological well-being (i.e., “If you don’t feel good about your race, then you can’t be happy”). Additionally, social support and a strong connection to same-race peers may also influence positive attitudes towards mental health and seeking mental health treatments.

***Theme three: “Drink tea and pray”.***

In terms of how race-related factors negatively impact mental health treatment seeking attitudes, focus groups discussed a variety of culturally specific barriers to utilizing mental health services. First, participants described how stigma around discussing mental health, both among peers their age as well as among their family members, is a factor that often led to a reluctance to seek mental health services. Second, participants described a general lack of awareness about mental health and a perceived lack of need to seek mental health services among Black communities and families. They described that over time, this lack of awareness may lead to decreased utilization of mental health services. Importantly, this lack of awareness was also associated with a misunderstanding about the nature of mental health and mental health services. For example, focus groups often highlighted how a lack of education about mental health among their parents and older African American generations often led to misinterpreting the causes or presentation of symptoms as laziness or controllable.

Third, participants described how these factors often led to not only decreased utilization of mental health resources, but also a perceived lack of social support from family members due to them being unaware of signs of psychological distress. This was often described as “generational differences” in understanding and utilizing mental health treatments, such that

African American young adults felt as if their generation supports mental health treatment seeking, but that older generations did not:

Participant 51: Right. It's never taken seriously with the family. As older generation, but yeah, that goes back to saying, like, the generational thing. Like, I see now, like, our whole- our generation is always on social media, talking about mental health and saying how they- giving out tips of how they do things everyday and stuff. And, but if you- I do that with my family, then it's like completely weird.

Participant 32: Yeah. It's weird because then my parents will be like, oh you can share anything with us-

Participant 51: No we can't.

Participant 32: And be like, "Yeah, not feeling well today." I don't want to hear it. I'm like, "but well, I tried."

Participant 51: (laughs)

Participant 32: (laughs) Like, you know? I can't- like, I don't know. But um, yeah. It's kind of hard, especially if, well, at least I know for my parents specifically, it's kind of just like I think that doesn't really exist. It's like oh, it's all in your head, like, you just go do some work.

Participant 51: Mm-hmm (affirmative).

Participant 32: Go do some readings. You'll be fine. Think about it later. Then if you just come up and mention it again, they'll just be like, "Oh, you're complaining." I'll be like, "Okay, well. I'm done with this conversation. (laughs) Okay."

Finally, focus groups often discussed a variety of family socialization messages they received growing up about mental health that also decreases African American young adults' motivation to seek mental health services. For example, participants discussed receiving messages related to hiding mental health symptoms to appear strong (i.e., maladaptive coping strategies), as well as relying exclusively on religious or non-medical interventions to cope with mental health symptoms (i.e., "drink tea and pray"). Taken together, focus groups often noted how these interactions were viewed as non-supportive and ultimately influenced by parents' lack of education about mental health services and mistrust of mental health providers. Interestingly, these interactions are not specific to young adults from traditional African American families, and many first-generation African and Caribbean young adults also reported similar non-supportive messages and interactions:

Participant 14: Or like with me, I'm Nigerian and my parents are also Nigerian and just the way ... Okay so like they relate mental health to being, they call it madness.

Participant 17: Same in Uganda culture.

Participant 14: So it's weird 'cause if you say if someone ... they relate it to madness. It's more of a joke... but it's just weird because then there's different layers to mental health. Kinda like your grandma, like they just brush it aside like, "Oh it's a problem." But I think with that they think it's crazy, like you can't control, it is what it is, more of like you can't fix it, you can't get support...

Taken together, these findings highlight that a lack of education around mental health and mental health services, which is likely influenced by systemic and structural factors that affect both young adults and older generations, has led to a decreased likelihood of utilizing traditional mental health services. More importantly, it appears that this lack of education influences maladaptive socialization messages received from family members related to how individuals understand and cope with psychological distress, which may also impact treatment utilization.

***Theme four: “Doors are open for white people.”***

Focus groups also highlighted that African American young adults are often at a disadvantage when seeking mental health services as compared to their White peers. More specifically, participants often noted how White young adults have increased access to mental health services. For instance, participants often discussed that they perceived that White young adults and their families/parents have more knowledge about mental health services and symptoms, and that conversations around mental health are not stigmatized within White communities. They also perceived that White young adults had more social support from others around seeking mental healthcare, and more positive attitudes towards utilizing mental healthcare services. One participant even highlighted how although the rates of psychological distress between African American and White young adults are similar, sociocultural barriers may lead to current disparities in mental healthcare:

Interviewer: Do you think that mental health is different for African Americans than it is for White Americans?

Participant 15: I would probably say, like, the rates for African Americans and other races are probably about the same or maybe slightly lower, give or take some, but I feel like it's more so the conversation around...mental health in African American communities because there's a huge stigma. I feel like often times it's pushed aside or something that's not discussed, or something, um, that people feel like you need to be ashamed of and they see it as a sign of weakness, not something that a lot of people go through. Um, so I, to answer your question, I don't think there's, like, a huge disparity. I think it's just the nature of how we have those discussions.

These perceived racial differences may even present unique challenges for bi-racial African American young adults, as one bi-racial participant noted that when discussing mental health problems and treatments, they have an easier time receiving social support from their White family members as compared to their African American family members. Altogether, these findings highlight how cultural and structural factors (e.g., reduced stigma and increased education about mental health within White communities) may contribute to disparities in utilizing mental healthcare between White and African American young adults.

***Theme five: “The only Black person I saw was the receptionist”.***

Finally, participants described a variety of systemic barriers to seeking mental health services, such as a lack of finances to cover treatment (e.g., costs of sessions being too expensive, lack of adequate insurance), and a lack of availability of services (i.e., lack of providers in predominately Black and/or low-income communities). They also described how a lack of therapists of color or Black mental health providers is often a barrier to seeking mental health services:

Participant 19: There's a lack of black representation. I know at least what I've seen as far as reading and seeing things on the internet, as far as mental health resources and providers, it did seem very whitewashed. I know for me, with mental health, just like with any other health provider, I'm going to feel a lot more comfortable if I can go to somebody that I know will understand my particular racial differences. Sometimes that's not available.

Participant 27: And then again, I feel mental health is becoming on the forefront now specifically, but it's definitely geared towards white people. So, we're still being felt like we're on the back-burner, even though it's prevalent now, taking care of your mental health and things.

Even more concerning, when college students knew about accessible mental health resources on campus (i.e., Campus Psychological Services; CAPS) that they could utilize despite the systemic barriers above, they often discussed how CAPS was limited for students of color. Participants often discussed that they found the brief/problem-focused psychotherapy format of CAPS unappealing, or that they felt as if CAPS did not offer a “safe space” for students (i.e., limited confidentiality given the likelihood of being seen by other students/campus members). Most importantly, many focus groups noted how they did not perceive that CAPS could offer culturally relevant services:

Participant 29: Alright, great. I think another main barrier is the lack of African Americans in that aspect. It's like, for instance, for me, when I went to CAPS, every person I talked to was white. There was not a black person except at the reception desk. So like, that might be a barrier because I might be trying to talk about something they wouldn't understand, so why would I speak about it if you can't understand, and I actually, like, understand anything I'm going through...

Taken together, these findings highlight that systemic barriers to utilizing mental health services (i.e., financial barriers), in combination with a lack of providers of color and perceived lack of culturally relevant services, often contributes to decreased utilization of mental health services among African American young adults.

### **Desired Features in Culturally-Adapted mHealth Interventions**

The second qualitative research question explored the features African American young adults desire within culturally-adapted mHealth interventions. The focus groups also explored desired topics and content related to mental health and culture, as well as factors that would impact utilization of mHealth interventions (Table D3). First, focus groups often highlighted a

variety of standard features that could be considered interventions for promoting adaptive mental health symptoms. For example, they stated that they would desire daily inspirational quotes related to psychological well-being and/or positive quotes related to being African American, the ability to engage in meditation and/or deep breathing exercises, minigames related to de-stressing, and the ability to access forums and/or discussion boards to build social support and discuss mental health related topics with other African Americans (i.e., often described as a “safe space”). Focus groups also discussed the desire for a “resource bank” that included coping and self-care strategies, psychoeducation about mental health symptoms, frequently asked questions about seeking mental health treatments, as well as the ability to journal (i.e., receiving daily journal prompts). Participants described wanting applications to be able to provide a variety of recommendations, such as being able to recommend Black or culturally-sensitive mental health providers in their area, or being recommended media (i.e., music, podcasts, videos, etc.) related to increasing their psychological well-being.

Most importantly, focus groups often discussed desiring the option to personalize applications, as well as have the ability to create and manage a profile. This profile would house their recommendations, current treatment plans, demographic information, personal preferences (i.e., favorite music, movies, television shows, etc.), as well as track their progress (i.e., monitoring changes in psychological symptoms). Based on their profile and how they use applications, participants discussed wanting personalized “suggested activities” to promote well-being. They also wanted their profile to have the ability to create a “support system” within applications, and the ability to connect to other users in an effort to create community and find social support during periods of psychological distress. Finally, participants described wanting to be able to assess their “warning signs” (i.e., symptoms of psychological distress), so that

applications can keep progress of these symptoms and recommend interventions (both through the application or in the community) if these symptoms became severe.

Focus groups also discussed a variety of features related to racial identity that they would want incorporated into mHealth interventions. For instance, they discussed desiring activities to reaffirm and explore their Black identity (i.e., minigames or short readings describing positive qualities of the Black experience, positive trends in Black culture). Additionally, they discussed desiring content that promoted racial identity development, such as positive narratives about the meaning of being Black, such as “counter narratives” that would combat the negative stereotypes that exist in American culture. Finally, focus groups discussed desiring special topics within the forums/discussion boards that are related to racial identity and discussing the meaning of being Black, and an opportunity to discuss and/or read about common experiences that African American young adults encounter. Overall, focus groups often discussed how racial identity development should be personalized to each individual, and often described it as a “journey” or a process towards developing a “global identity”, which highlights the importance of such applications to take into account the heterogeneity among Black racial identity beliefs.

Focus groups also highlighted the need for applications to directly provide resources for coping with experiences of racial discrimination. For example, groups discussed wanting to be able to report instances of individual discrimination (i.e., workplace discrimination, online discrimination), as well as resources related to obtaining legal advice or utilizing interventions for dealing with individual and structural experiences of discrimination. Additionally, focus groups described wanting resources to be better able to “identify” subtle experiences of discrimination or microaggressions, as well as content related to understanding how experiences of racial discrimination (i.e., police brutality) may influence mental health symptoms. Finally,



participants often discussed how applications should be able to help individuals process their emotional reactions to experiences of discrimination, provide affirmations (i.e., presenting positive quotes related to being Black, such as offering positive cultural history facts) after experiences of discrimination, and also teach problem-solving skills or possible solutions related to encountering future experiences of discrimination or microaggressions.

### **Desired Topics and Content.**

Second, focus groups discussed topics and content that they would desire in culturally-adapted mHealth interventions for mental health. As noted above, focus groups participants desired content related to racial identity and race-related stress/racial discrimination. Moreover, participants described wanting psychoeducation on daily stressors that affect mental health (family/relationship stress, academic stress, and the association between stress and mental health), as well as common psychological symptoms (e.g., anxiety symptoms, depressive symptoms and mood disorders, panic attacks, personality disorders, and ways to self-assess symptoms responsibly). Given the rising rate of suicide among African Americans (U.S.D.H.H.S.O.M.M.H., 2016), participants also described desiring content related to understanding and recognizing suicidality among African Americans. Given the age group and the transition between high school and college, some focus group participants also described desiring contents related to their high school experiences, such as coping with bullying (particularly on social media), building self-esteem, transitioning through puberty, and understanding the effects of social media on mental health. Finally, focus groups discussed desiring content related to coping with psychological distress (e.g., recovery steps from substance abuse or severe depression, self-care strategies), as well as content related to self-empowerment (e.g., resources related to increasing one's self-image and self-esteem).

In regard to how to facilitate adaptive mental health practices, focus groups also described a variety of strategies that culturally-adapted mHealth should promote. For example, they highlighted the importance of promoting self-care practices (i.e., increasing one's self-awareness of their mental health symptoms, journaling, and meditation/mindfulness practices). They also discussed increasing communication about mental health among their peers, as well as increasing their social support. They also desired activities unique to the Black experience to decrease psychological distress (i.e., culturally-relevant behavioral activation options such as attending a culturally-relevant concert). Finally, despite non-supportive family socialization messages related to religion noted above, some participants did highlight the desire to have content related to using religion and spirituality to promote psychological well-being.

#### **Application Utilization Preferences and Considerations.**

Next, the focus groups explored factors that would impact utilization of culturally-adapted mHealth interventions and ways to increase utilization of such technologies among African American young adults. For instance, participants described the importance of anonymity and confidentiality, such that users should have the option to hide their profile if they are only interested in browsing content or utilizing resources (versus interacting with other users in forums, creating a social support network, etc.). Additionally, participants described wanting to utilize the application flexibly in a variety of ways. For example, participants often described wanting to be able to use the application both as an individual intervention (i.e., utilize resources independent of external psychotherapy), as well as an adjunct to treatment (i.e., utilizing resources with the guidance of a mental health provider). In line with this, focus groups often described positive attitudes towards professional assistance from mental health providers when utilizing mHealth interventions. For example, many participants often noted that they would

desire the option to access a “hotline” or have phone sessions with mental health service providers during crises or for consultation sessions. Additionally, focus groups described wanting the *format* of the application to be flexible, such that it should be an application that can be accessed via traditional web browsers, as well as an application formatted specifically for mobile devices and accessible through services such as the Google Play/Apple App Store (formatted for iOS and Android mobile devices).

Focus groups also discussed desiring that such applications be used to recover from psychological distress, as well as a preventative intervention to maintain/promote psychological well-being. Moreover, focus groups often described wanting professional “moderators” to monitor application usage (i.e., removing/suspending accounts that spread false or negative information, facilitating local “meet-ups”, monitoring and removing fake profiles). Importantly, participants highlighted that in order to make such applications accessible to African American young adults, these applications should be free to download and utilize. Participants also described wanting applications to be connected to other mHealth technologies (i.e., FitBit, Apple Watch, Calm, fitness trackers, etc.), in an effort to better manage their overall well-being. In contrast, they discussed wanting limited connectivity to social media applications (i.e., Twitter, Facebook, etc.), because of concerns related to confidentiality or being harassed due to discussing mental health topics.

Given the variety of barriers to mental health treatment seeking among African American young adults, focus groups also discussed a variety of ways that culturally-adapted mHealth applications could be advertised to increase their utilization. First, they described advertising the application via social media sites. They also described how users should be able to advertise the application among their own networks (i.e., having the ability to send a link to download the

application to friends or family members). They also desired community demonstration events, such as opportunities to interact with these applications on college campuses in public demonstration spaces. Finally, they described desiring “promotional challenges” to increase utilization of applications (i.e., receiving an award after utilizing the app for a certain amount of time), as well as testimonials and/or reviews from other users.

Second, focus groups often discussed ways to increase motivation to continually engage with culturally-adapted mHealth interventions among African American young adults. For example, focus groups discussed how receiving periodic notifications or “push messages” to open the application, utilize self-care strategies, or engage in other activities (i.e., mindfulness), would motivate them to engage with applications. They also discussed how being able to track progress and receive rewards (i.e., reward points, “leveling” system, etc.) as they utilize the application over time would ensure that they continuously engage with such technologies. They also described that increasing the appeal of the application, both visual appeal (i.e., enticing designs and personalization options), as well as continuously updating the application with cutting-edge research on African American mental health, would increase motivation for utilizing the application over time. Finally, focus groups discussed desiring to be able to share the application and its content with others in order to increase awareness about mental health and mental health treatment seeking to further help build a community within the application.

### **The Evaluation of Current mHealth Interventions**

Finally, focus groups actively tested and evaluated a variety of current mHealth interventions for mental health (i.e., the CBTi, Mood Coach, STAIR and Safe Place applications), and provided their feedback as well as general considerations for improving current mHealth interventions (Table D4). It is important to note that all interventions received both positive and

negative feedback, and the purpose of participants' evaluations were to highlight features that they found particularly appealing, effective (or in contrast, confusing or ineffective). As a result, these user experiences may help tailor future mHealth interventions.

Overall, participants across all twelve focus groups endorsed liking the Safe Place application the most (twenty-five references of the "Liked the Safe Place" code), followed by the Mood Coach (twenty-two references), and the STAIR application (thirteen references). The CBTi application was liked the least amount of times (three references). Across these applications, focus groups highlighted a variety of features that they found appealing or effective. For example, they liked having access to inspirational quotes, popular media, and community forums/discussion boards (the Safe Place). More specifically, the Safe Place often emerged as the most liked application due to its cultural relevancy, as focus groups often described that the content and design was clearly related to Black culture. They also liked the ability to self-assess their psychological symptoms (Mood Coach, STAIR), and receive recommendations for both activities and interventions (Mood Coach). They also liked having the ability to access a recommended list of providers by city and state (the Safe Place). Participants often described applications' layouts (i.e., visuals, ease of navigation, clarity of content) as appealing factors of applications (Mood Coach & STAIR). Additionally, participants highlighted that psychoeducation about common psychological symptoms (all four applications), the ability to receive notifications (Mood Coach, STAIR, CBTi), the ability to engage in deep breathing and thought monitoring (STAIR), and the ability to set goals and measure progress (Mood Coach & STAIR) as positive aspects of the available applications.

In contrast, participants across all focus groups mentioned disliking the CBTi application the most (ten references of the "Disliked CBTi" code), followed by the Safe Place (five

references). Participants described disliking the Mood Coach and STAIR applications overall the least amount of times (one and two references, respectively). In exploring what aspects of these applications participants disliked, unappealing layouts (i.e., “appearing bland”, lack of color, etc.) emerged as the most common complaint (twenty-seven references) for both the CBTi and Safe Place applications. They also described that the length and quantity of articles on the Safe Place, the tutorial mode associated with the Mood Coach, and the quantity of activities on STAIR were overwhelming and/or confusing at times. Additionally, they also described desiring more accountability from applications (Mood Coach, CBTi), such that they felt as if they would not commit to intervention plans if there were a lack of notifications, reminders, or overall encouragement for engaging with the applications.

Participants also described that each application lacked features that they found desirable. For example, in terms of the Safe Place, participants wanted the application to incorporate more psychoeducation about serious mental illness as well as overall well-being (i.e., relationship health, physical health, etc.), the ability to journal, and the ability to search through resources. Furthermore, in terms of the CBTi, STAIR, and Mood Coach applications, participants often described desiring more psychoeducation and content relevant to African Americans and the Black experience. Finally, participants noted that for all applications, they would be more effective if they had the ability to interact with professional mental health therapists either virtually or through discussion boards/forums. In sum, to further improve the tested applications, participants often noted that they would either desire that the CBTi, STAIR, and Mood Coach applications were more culturally relevant, and/or they desired combining the cultural relevance of the Safe Place with the evidence-based interventions and visual appeal from the other three applications.

## **Discussion**

Given the disparities in access to and utilization of mental health services among African American young adults (A.H.R.Q., 2013), mHealth for mental health provides a promising opportunity to increase access to and engagement with evidence-based mental health services (Zheng et al., 2014). Though limited, technology-based interventions for African Americans (i.e., African American parents/families) highlights the initial effectiveness and acceptability of mHealth (Murry et al., 2018). Unfortunately, African American young adults are still underrepresented in mHealth research (Smith & Paige, 2015), which limits our understanding of how mHealth should be developed and designed for this group. As a result, the current study utilized focus groups of African American young adults to inform the development of future culturally-adapted mHealth applications for treating mental health symptoms.

### **Next Steps for Culturally-Adapted mHealth for African American Young Adults**

First, in line with extant research (i.e., American Psychological Association, 2014; Williams & Mohammed, 2013), focus groups discussed how systemic barriers specific to African Americans (i.e., lack of insurance or ability to afford therapy), coupled with a lack of desirable local providers (i.e., lack of African American providers or culturally sensitive providers), leads to disparities in utilizing mental health services. Even more concerning, participants felt as if they were at a disadvantage to their White young adult peers, given that these barriers do not exist for them combined with more positive attitudes towards mental health among White young adults (Narendorf, 2018). As a result, the findings suggest that the development of free/affordable, culturally-adapted mHealth specifically for African American young adults is an urgent need and may help reduce disparities in utilization of mental healthcare services. These

technologies may also build feelings of self-efficacy for coping with psychological distress among this population.

Second, in line with a large body of research (i.e., Williams & Mohammed, 2009; Williams & Mohammed, 2013), the findings also highlight that a variety of race-related stressors lead to psychological distress and influences maladaptive coping symptoms among African American young adults. The creation of culturally-adapted mHealth interventions may provide resources to aid African American young adults in coping with these unique stressors (i.e., techniques to reduce feelings of hypervigilance after experiences of vicarious discrimination). Furthermore, the findings highlighted that these stressors also led to feelings of “resiliency” and positive racial identity beliefs which were related to overall psychological well-being. This may be unique to African Americans in this developmental period, as young adulthood is a period of increased stress for African Americans that is sometimes associated with negative outcomes (i.e., Hurd et al., 2013), especially given that learning how to cope with race-related stress and committing to one’s racial identity may be an important task during this period. As a result, one of the primary tasks of culturally-adapted mHealth interventions for this group should involve highlighting these associations and supporting this group through this developmental period as they grapple with race-related stressors while developing their racial identity.

Moreover, not only did negative race-related experiences increase participants’ connection to their racial group, these positive racial identity beliefs also increased their connection to other African American young adults. These connections allowed for increased perceptions of social support and increased positive feelings about mental health treatments. In line with these qualitative findings, the quantitative results suggested that both private regard (i.e., positive feelings about being Black and positive feelings about other Black people) and nationalist



ideology (i.e., emphasizing the uniqueness of the Black experience) beliefs were positively associated with positive attitudes about mental health and mental health treatments. Taken together, culturally-adapted mHealth should also facilitate a “community space” or opportunities for young adults to connect with each other within applications to further facilitate psychological well-being and mental health support.

Additionally, the findings revealed that another key task for culturally-adapted interventions will be to increase awareness and understanding of mental health and mental health treatments. Similar to quantitative studies of young adults (e.g., Gagnon, Gelinias, & Friesen, 2017; Narendorf et al., 2018), stigma and lack of knowledge were barriers to mental health treatment, whereas support from friends facilitated mental health treatment seeking. In contrast to these previous studies, family interactions did not facilitate mental health treatment seeking among this sample, and findings highlights intergenerational barriers to seeking mental healthcare and receiving social support from family members. These barriers are likely influenced by cultural factors, given the history of mistrust of healthcare providers (i.e., A.H.R.Q., 2013). As a result, within culturally-adapted mHealth, psychoeducation may help dismantle the negative socialization messages about mental health that young adults receive from others (i.e., hiding mental health symptoms). Additionally, strategies or interventions that increase communication between African American young adults and their family members about mental health and treatments may both help improve perceived social support from family members, as well as begin to decrease stigma and negative beliefs about mental health among older generations.

## **Culturally-Adapted mHealth versus Traditional mHealth: Features and Content**

As the survey results suggest, African American young adults strongly supported the appropriateness of mHealth interventions for treating mental health symptoms, and had strong desires for utilizing culturally-adapted mHealth applications. These findings are in line with systematic reviews of mHealth technology (Donker et al., 2013), and extends previous research in that it is among the first to suggest that African American young adults in particular perceived mHealth applications as a useful vehicle for seeking mental health treatment. More importantly, this further highlights how culturally-adapted mHealth may circumvent the sociocultural barriers to treatment highlighted above by enhancing access to evidence-based monitoring and self-help for mental health (Donker et al., 2013).

Furthermore, the features highlighted above, as well as the feedback on current mHealth interventions, should guide future culturally-adapted mHealth interventions for this population. This is important given that in light of the feedback on current mHealth options (i.e., desiring more cultural relevancy from evidence-based applications), no current free mHealth applications appear to meet the needs of African American young adults. Despite this, some features currently available within applications are in line with what has been found desirable in other studies of mHealth, such as the ability to use applications daily, the importance of convenience, the ability to view one's progress and track goals, and having an application that is easy to use (Dennison, Morrison, Conway, & Yardley, 2013; Harrison et al., 2011; Chan, Torous, Hinton, & Yellowlees, 2014). Similarly, the negative feedback about the tested applications were also in line with findings from other studies that highlight undesirable components of mHealth, such as the negative perception of applications with confusing content or features and a potential lack of motivation to engage continually with mHealth. Similar to previous studies, having applications

connected to online social media was also disliked/not desired by participants in this study (Dennison et al., 2013). This study extends this research by highlighting additional, culturally-relevant features (e.g., ability to find African American mental health providers, activities that promote racial identity exploration) and content (e.g., resources related to coping with racial discrimination), that should be in culturally-adapted mHealth. These findings also suggest ways to improve motivation and engagement among African American young adults, such as creating advertisements on social media and featuring positive testimonials or reviews from those who have used the applications.

Whereas other studies of young adults found that aspects such as constant notifications/reminders were undesirable (Dennison et al., 2013), this sample encouraged the use of reminders to encourage continued engagement with applications. In another study, young healthy adults believed that mHealth should be for those in severe distress, yet, African American young adults that were not in severe distress highlighted the importance of utilizing mHealth to maintain psychological well-being and prevent severe psychological distress. These positive attitudes towards engaging with mHealth may be reflective of overall positive attitudes towards mental health and the desire for culturally-adapted mHealth given disparities in mental healthcare and a perceived lack of cultural relevancy among traditional mHealth offerings.

The community aspect (i.e., forums and discussion boards) was also another desired feature unique to this sample. In fact, other reviews of mental health mHealth found that users were unwilling to discuss mental health topics in community forums (i.e., Nicholas et al., 2017), but the studies reviewed did not include majority African American samples. It could be that for African American young adults, given the link between social support, connection with same-race peers, and psychological well-being, having a community aspect should be a key feature of

culturally-adapted mHealth (with the caveat of respecting users' anonymity and confidentiality). One way this may be accomplished is by bridging social media and community forums within future applications. Others have highlighted that one challenge of mHealth is utilizing social media in a way that makes interventions more engaging and provides social support, given the limited desire of having these applications connected to social media (Dennison et al., 2013). The findings from this study highlight that a community page that functions similar to social media (i.e., "Twitter feeds", ability to post updates and interact with others, etc.) was still desired by participants and may be a way to bridge this gap of using social media functions to facilitate engagement in mHealth while building community among African American young adults.

Finally, traditional mHealth apps have been shown to improve communication between clients and mental health providers (Reid et al., 2012). Specifically, Reid and colleagues (2012) found that mHealth applications help providers better understand clients' symptoms, aids in tailoring discussions around the clients' presenting problems during consultations/therapy, and facilitates the development of rapport. Fortunately, the current study findings suggest that African American young adults desire professional assistance and the ability to communicate with mental health providers while using culturally-adapted mHealth applications. As a result, culturally-adapted mHealth utilization may actually help increase utilization of in-person mental health services over time.

### **Racial Discrimination, Racial Identity, and Culturally-Adapted mHealth**

In addition to the utilization factors that focus groups discussed that might affect engagement with mHealth, it is also important to explore how individual-level sociocultural factors (i.e., previous experiences of racial discrimination and racial identity beliefs) might affect mHealth utilization. For example, previous studies have shown that more frequent experiences of

discrimination led to increased stigma towards mental health treatment, whereas stronger levels of ethnic identity are related to decreased stigma (Cheng et al., 2013). This study is among the first to explore how these factors may be associated specifically with attitudes towards culturally-adapted mHealth technologies. In contrast to previous studies (i.e., Cheng et al., 2013), experiences of vicarious ORD were positively associated with a stronger desire for culturally-adapted mHealth interventions for mental health. It could be that since these experiences are frequent for this sample, and since they occur exclusively online, they may influence desires for culturally-relevant resources to cope with these experiences via mHealth technologies. For example, focus groups participants noted how they often received positive messages about mental health and seeking mental healthcare on social media. In light of this, as African American young adults navigate social media, though they are exposed to frequent experiences of vicarious ORD, they may also be receiving culturally relevant, positive messages about mental health and treatments from other African Americans. In turn, these experiences on social media may be influencing a desire for culturally-adapted mHealth, specifically those that address coping with these forms of discrimination.

Next, higher levels of private regard were associated with more positive attitudes towards the appropriateness of utilizing mHealth for mental healthcare. Higher levels of private regard and nationalist ideology were also associated with stronger desires for culturally-adapted mHealth applications for mental health. In regards to private regard and nationalist ideology, it could be that these beliefs may be reflective of having a strong connection to African Americans and the Black experience (i.e., Sellers et al., 1998), which may be related to desiring technologies that are created specifically for African Americans, as well as using mHealth to facilitate connections to other African Americans. As highlighted by the focus groups findings, positive feelings about

being Black are related to increased feelings of connection to other African Americans and positive experiences related to receiving social support from other African Americans, which may also support why these beliefs are related to mHealth technologies. More specifically, other researchers have highlighted that online spaces may become “safe spaces” to discuss race issues, process race-related stress, and effectively serve as an online “safe haven” (Tynes, Garcia, Giang, & Coleman, 2011). As a result, private regard and nationalist ideology beliefs may be related to strong desires for having a “safe space” within culturally-adapted mHealth.

Finally, although participants only had moderate levels of assimilationist ideology (i.e., beliefs related to emphasizing the similarities between African Americans and mainstream culture), higher levels of these beliefs were also related to stronger desires for culturally-adapted mHealth. This association may be related to the qualitative findings that indicate participants’ perceived disadvantage at being able to access mainstream mental health services compared to their White counterparts. For example, participants may desire using culturally-adapted mHealth to begin to feel as equipped to cope with or prevent mental illness as they perceive their White peers are. Additionally, it could also be that African American young adults desire culturally-adapted technologies in an effort to feel less isolated as they navigate and seek to integrate within predominately White spaces.

### **Limitations and Future Directions**

Though this mixed methods study offered several findings that will positively impact the future development of culturally-adapted mHealth technologies, a few limitations must be noted. Given the small sample size, it will be difficult to make any substantial inferences about the correlational associations, but these exploratory findings can begin to establish some preliminary evidence for the associations under investigation. Also, the majority of participants were African

American young adult women, so the results presented may be more relevant to culturally-adapted mHealth with this population. Future studies should incorporate more African American young adult men into mHealth research. Additionally, usability and acceptance issues are prevalent issues for mHealth development (Luxton et al., 2011). Participants in the study were college-educated, had access to smartphones and used smartphone applications often, and had positive attitudes towards using mHealth for mental health. As a result, this sample may not accurately represent the beliefs and attitudes of other African American young adults. For instance, on one hand, young adults from rural backgrounds, or who did not attend a four-year college, and/or who use technology less often, may have different attitudes towards seeking mental health treatments and using mHealth for mental healthcare. On the other hand, findings from studies with more heterogenous samples may be similar to this one, as one qualitative study of community-dwelling African American men found that they held positive attitudes towards mental health treatment seeking and did not perceive stigma as a barrier to help seeking (Ward & Besson, 2013). In the end, to ensure that culturally-adapted mHealth is designed to be effective for all African American young adults, future studies are needed with more heterogenous populations of African American young adults.

Additionally, as highlighted above, the developmental period of young adulthood may be a unique period where individuals grapple with racial identity development and learning how to cope with race-related stress. Experiences during this period may be directly related to desires of having access to culturally-adapted mHealth technologies to facilitate this developmental process. Going forward, future studies should also explore best practices and desired features or content that are relevant for designing culturally-adapted mHealth for African American children and families, as well as older African American adults. In line with this, many participants in

focus groups highlighted how they perceived a need for culturally-adapted mental health resources for high school students (i.e., dealing with bullying, building a self-esteem prior to college, etc.).

### **Conclusion**

In summary, the current study highlights that there is an urgent need for mHealth technology for mental health symptoms for African American young adults. Given the unique sociocultural experiences and barriers that impact mental health and treatment seeking attitudes, it is imperative that these technologies are culturally-adapted so that they meet the unique needs of this population. The findings from the current study can be viewed as recommendations to effectively design future culturally-adapted mHealth interventions, with the hope of reducing current disparities in the mental health outcomes, as well as disparities in the access to and utilization of mental health treatments, among African American young adults.



## REFERENCES

- Agency for Healthcare Research and Quality. (2013). *National healthcare disparities report*. Retrieved from <http://www.ahrq.gov/research/findings/nhqrdr/nhdr13/chap2-txt.html#fig231>
- American Psychological Association. (2014). *Mental health disparities: African Americans*. Retrieved from <http://marccr.com/documents/BHS/Fact-Sheet-African-Americans.pdf>
- Bardram, J. E., Frost, M., Szanto, K., Faurholt-Jepsen, M., Vinberg, M., & Kessing, L. V. (2013). Designing mobile health technology for bipolar disorder: a field trial of the monarca system. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 2627–2636. <https://doi.org/10.1145/2470654.2481364>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77-101.
- Brondolo, E., Ver Halen, N. B., Pencille, M., Beatty, D., & Contrada, R. J. (2009). Coping with racism: A selective review of the literature and a theoretical and methodological critique. *Journal of Behavioral Medicine*, 32(1), 64–88. <https://doi.org/10.1007/s10865-008-9193-0>
- Chan, S., Torous, J., Hinton, L., & Yellowlees, P. (2014). Mobile Tele-Mental Health: Increasing Applications and a Move to Hybrid Models of Care. *Healthcare*, 2(2), 220–233. <https://doi.org/10.3390/healthcare2020220>
- Cheng, H. L., Kwan, K. L. K., & Sevig, T. (2013). Racial and ethnic minority college students' stigma associated with seeking psychological help: Examining psychocultural correlates. *Journal of Counseling Psychology*, 60(1), 98–111. <https://doi.org/10.1037/a0031169>
- Chou, T., Asnaani, A., & Hofmann, S. G. (2012). Perception of racial discrimination and psychopathology across three US ethnic minority groups. *Cultural Diversity and Ethnic Minority Psychology*, 18(1), 74.
- DeFreitas, S. C., Crone, T., DeLeon, M., & Ajayi, A. (2018). Perceived and Personal Mental health stigma in latino and african american college students. *Frontiers in Public Health*, 6, 49.
- Dennison, L., Morrison, L., Conway, G., & Yardley, L. (2013). Opportunities and challenges for smartphone applications in supporting health behavior change: qualitative study. *Journal of Medical Internet Research*, 15(4), 1–12. <https://doi.org/10.2196/jmir.2583>
- Dill, L. J., Mahaffey, C., Mosley, T., Treadwell, H., Barkwell, F., & Barnhill, S. (2016). “I want a second chance”: Experiences of African American fathers in reentry. *American Journal of Men's Health*, 10, 459-465.

- Donker, T., Petrie, K., Proudfoot, J., Clarke, J., Birch, M. R., & Christensen, H. (2013). Smartphones for smarter delivery of mental health programs: A systematic review. *Journal of Medical Internet Research*, *15*(11), 1–13. <https://doi.org/10.2196/jmir.2791>
- Gagnon, M. M., Gelin, B. L., & Friesen, L. N. (2017). Mental Health Literacy in Emerging Adults in a University Setting: Distinctions Between Symptom Awareness and Appraisal. *Journal of Adolescent Research*, *32*(5), 642–664. <https://doi.org/10.1177/0743558415605383>
- Greenbaum, T.L. (2000), *Moderating Focus Groups: A Practical Guide for Group Facilitation*, Sage, Thousand Oaks, CA.
- Harrell, S. P. (1994). *The Racism and Life Experience scales*. Unpublished manuscript.
- Harrison, V., Proudfoot, J., Wee, P. P., Parker, G., Pavlovic, D. H., & Manicavasagar, V. (2011). Mobile mental health: Review of the emerging field and proof of concept study. *Journal of Mental Health*, *20*(6), 509–524. <https://doi.org/10.3109/09638237.2011.608746>
- Henry, J. D., & Crawford, J. R. (2005). The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample. *British Journal of Clinical Psychology*, *44*(2), 227-239.
- Holtz, B. E., Murray, K. M., Hershey, D. D., Dunneback, J. K., Cotten, S. R., Holmstrom, A. J., ... Wood, M. A. (2017). Developing a Patient-Centered mHealth App: A Tool for Adolescents With Type 1 Diabetes and Their Parents. *JMIR mHealth and uHealth*, *5*(4), e53. <http://doi.org/10.2196/mhealth.6654>
- Hudson, D. L., Eaton, J., Banks, A., Sewell, W., & Neighbors, H. (2018). “Down in the Sewers”: Perceptions of Depression and Depression Care Among African American Men. *American Journal of Men’s Health*, *12*(1), 126–137. <https://doi.org/10.1177/1557988316654864>
- Jones, D. J. (2014). Future directions in the design, development, and investigation of technology as a service delivery vehicle. *Journal of Clinical Child & Adolescent Psychology*, *43*(1), 128-142. doi:10.1080/15374416.2013.859082
- Kazdin, A. E., & Blasé, S. L. (2011). Rebooting psychotherapy research and practice to reduce the burden of mental illness. *Perspectives on Psychological Science*, *6*(1), 21-37. doi:10.1177/1745691610393527
- Keum, B. T. H., & Miller, M. J. (2017). Racism in digital era: Development and initial validation of the perceived online racism scale (PORS v1.0). *Journal of Counseling Psychology*, *64*(3), 310–324. <https://doi.org/10.1037/cou0000205>
- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., Walters, E. E., & Patton, G. C. (2011). A mobile phone application for the assessment and management of youth mental health problems in primary care: A randomised controlled trial. *BMC Family Practice*, *12*(1), 1–14. <https://doi.org/10.1001/archpsyc.62.6.593>
- Lane, N., Mohammad, M., Lin, M., Yang, X., Lu, H., Ali, S., ... Campbell, A. (2011). BeWell: A Smartphone Application to Monitor, Model and Promote Wellbeing. *Proceedings of the 5th International ICST Conference on Pervasive Computing Technologies for Healthcare*, (March 2015). <https://doi.org/10.4108/icst.pervasivehealth.2011.246161>

- Lasser, K. E., Himmelstein, D. U., Woolhandler, S. J., McCormick, D., & Bor, D. H. (2002). Do minorities in the United States receive fewer mental health services than whites?. *International Journal of Health Services*, 32(3), 567-578.
- Luxton, D. D., McCann, R. A., Bush, N. E., Mishkind, M. C., & Reger, G. M. (2011). MHealth for mental health: Integrating smartphone technology in behavioral healthcare. *Professional Psychology: Research and Practice*, 42(6), 505–512. <https://doi.org/10.1037/a0024485>
- Martin, P. P., Wout, D., Nguyen, H., Sellers, R. M., & Gonzalez, R. (2008). *Investigating the Psychometric Properties of the Multidimensional Inventory of Black Identity in Two Samples: The Development of the MIBI-S*. Unpublished manuscript.
- Morgan, D. L. (1996). Focus groups. *Annual Review of Sociology*, 22, 129-152.
- Morgan, D. L., & Krueger, R. A. (1998). *The focus group kit*. Thousand Oaks, CA: Sage.
- Mulvaney, S. A., Anders, S., Smith, A. K., Pittel, E. J., & Johnson, K. B. (2012). A pilot test of a tailored mobile and web-based diabetes messaging system for adolescents. *Journal of Telemedicine and Telecare*, 18(2), 115-118.
- Murry, V. M. B., Berkel, C., & Liu, N. (2018). The Closing Digital Divide: Delivery Modality and Family Attendance in the Pathways for African American Success (PAAS) Program. *Prevention Science*, 19(5), 642–651. <https://doi.org/10.1007/s11121-018-0863-z>
- Musiat, P., & Tarriner, N. (2014). Collateral outcomes in e-mental health: A systematic review of the evidence for added benefits of computerized cognitive behavior therapy interventions for mental health. *Psychological Medicine*, 44(15), 3137-3150. doi:10.1017/S0033291714000245
- Narendorf, S. C., Munson, M. R., Ben-david, S., Cole, A. R., & Scott Jr., L. D. (2018). Race and gender differences in attitudes toward help seeking among marginalized young adults with mood disorders: A mixed-methods investigation. *Psychiatric Rehabilitation Journal*, 41(4), 277–289. <https://doi.org/10.1037/prj0000312>
- Neblett, E. W., Bernard, D. L., & Banks, K. H. (2016). The moderating roles of gender and socioeconomic status in the association between racial discrimination and psychological adjustment. *Cognitive and Behavioral Practice*.
- Neblett, E. W., & Carter, S. E. (2012). The Protective Role of Racial Identity and Africentric Worldview in the Association Between Racial Discrimination and Blood Pressure. *Psychosomatic Medicine*, 74(5), 509–516 <http://doi.org/10.1097/PSY.0b013e3182583a50>
- Nicholas, J., Fogarty, A. S., Boydell, K., & Christensen, H. (2017). The reviews are in: A qualitative content analysis of consumer perspectives on apps for bipolar disorder. *Journal of Medical Internet Research*, 19(4). <https://doi.org/10.2196/jmir.7273>

- Norton, P. J. (2007). Depression Anxiety and Stress Scales (DASS-21): Psychometric analysis across four racial groups. *Anxiety, Stress, and Coping*, 20(3), 253-265.
- Reid, S. C., Kauer, S. D., Khor, A. S., Hearps, S. J. C., Sancu, L. A., Kennedy, A. D., & Patton, G. C. (2012). Using a mobile phone application in youth mental health: An evaluation study. *Australian Family Physician*, 41(9), 711–714. <https://doi.org/10.1186/s13063-016-1740-3>
- Rivas-Drake, D., Seaton, E. K., Markstrom, C., Quintana, S., Syed, M., Lee, R. M., ... Sellers, R. M. (2014). Ethnic and Racial Identity in Adolescence: Implications for Psychosocial, Academic, and Health Outcomes. *Child Development*, 85(1), 40–57. <https://doi.org/10.1111/cdev.12200>
- Schmitt, M. T., Branscombe, N. R., Postmes, T., & Garcia, A. (2014). The consequences of perceived discrimination for psychological well-being: a meta-analytic review. *Psychol Bull*, 140(4), 921–948. <https://doi.org/10.1037/a0035754>
- Seaton, E. K., Upton, R. D., Sellers, R. M., Neblett, E. W., & Hammond, W. P. (2011). The moderating capacity of racial identity between perceived discrimination and psychological well-being over time among African American youth. *Child Development*, 82(6), 1850–1867. <http://doi.org/10.1111/j.1467-8624.2011.01651.x>
- Sellers, R. M., Smith, M. A., Shelton, J. N., Rowley, S. A. J., & Chavous, T. M. (1998). Multidimensional model of racial identity: A Reconceptualization of African American racial identity. *Personality and Social Psychology Review*, 2(1), 18–39. <http://doi.org/10.1207/s15327957pspr0201>
- Smith, A., & Page, D. (2015, April 1). *U.S. Smartphone use in 2015*. Retrieved from [http://www.pewinternet.org/files/2015/03/PI\\_Smartphones\\_0401151.pdf](http://www.pewinternet.org/files/2015/03/PI_Smartphones_0401151.pdf)
- Smith, T. B., & Silva, L. (2011). Ethnic identity and personal well-being of people of color: a meta-analysis. *Journal of Counseling Psychology*, 58(1), 42. <https://doi.org/10.1037/a0021528>
- Stephan, L. S., Dytz Almeida, E., Guimaraes, R. B., Ley, A. G., Mathias, R. G., Assis, M. V., & Leiria, T. L. L. (2017). Processes and Recommendations for Creating mHealth Apps for Low-Income Populations. *JMIR mHealth and uHealth*, 5(4), e41. <https://doi.org/10.2196/mhealth.6510>
- Tynes, B. M., Del Toro, J., & Lozada, F. T. (2015). An Unwelcomed Digital Visitor in the Classroom: The Longitudinal Impact of Online Racial Discrimination on Academic Motivation. *School Psychology Review*, 44(4), 407-424
- Tynes, B. M., García, E. L., Giang, M. T., & Coleman, N. E. (2011). The racial landscape of social network sites: Forging identity, community, and civic engagement. *I/S: A Journal of Law and Policy for the Information Society*, 7(1), 71–100.

- Tynes, B. M., Rose, C. A., & Williams, D. R. (2010). The Development and Validation of the Online Victimization Scale for Adolescents. *Cyberpsychology: Journal of Psychological Research on Cyberspace*, 4(2), 1–15. Retrieved from <http://cyberpsychology.eu/view.php?cislocanku=2010112901&article=1>
- Tynes, B. M., Umaña-Taylor, A. J., Rose, C. A., Lin, J., & Anderson, C. J. (2012). Online racial discrimination and the protective function of ethnic identity and self-esteem for African American adolescents. *Developmental Psychology*, (48)2, 343-355
- U.S. Department of Health and Human Services Office of Minority Mental Health. (2016). *Mental health and African Americans*. Retrieved from <http://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=24>
- Ward, E. C., & Besson, D. D. (2013). African American Men’s Beliefs About Mental Illness, Perceptions of Stigma, and Help-Seeking Barriers. *The Counseling Psychologist*, 41(3), 359–391. <https://doi.org/10.1177/0011000012447824>
- Williams, D. R., & Mohammed, S. A. (2009). Discrimination and racial disparities in health: Evidence and needed research. *Journal of Behavioral Medicine*, 32(1), 20–47. <https://doi.org/10.1007/s10865-008-9185-0>
- Williams, D. R., & Mohammed, S. A. (2013). Racism and health I: Pathways and scientific evidence. *The American Behavioral Scientist*, 57(8), 1152–1173. <https://doi.org/10.1177/0002764213487340>
- Willis, H. A., & Neblett, E. W. (2018). OC symptoms in African American young adults: The associations between racial discrimination, racial identity, and obsessive-compulsive symptoms. *Journal of Obsessive-Compulsive and Related Disorders*, 19 (August 2018), 105–115. <https://doi.org/10.1016/j.jocrd.2018.09.002>
- Zheng, J., Parnell, L. D., Smith, C. E., Lee, Y., Jamal-, A., Ma, Y., ... Lai, C. (2014). NIH Public Access, 60(1), 186–196. <https://doi.org/10.1373/clinchem.2013.215251>. Circulating
- Zickuhr, K., & Smith, A. (2012). *Digital differences*. Retrieved from <http://pewinternet.org/Reports/2012/Digital-differences.aspx>

## **INTEGRATIVE DISCUSSION**

Given disparities in access to mental healthcare among African American young adults and rising suicide rates among this group (Agency for Healthcare Research and Quality, 2013; U.S. Department of Health and Human Services Office of Minority Mental Health, 2016), there is an urgent need for culturally-adapted mHealth technologies for mental health symptoms for this population. For such technologies to be effective, the field must improve its understanding of how this group currently experiences sociocultural risk and protective factors (e.g., racial discrimination and racial identity beliefs, respectively). Finally, given that African American young adults are still underrepresented in mHealth research, (i.e., Zickuhr & Smith, 2012), little is known about how to effectively design mHealth for this group. As a result, the current dissertation has sought to fill these gaps in the current literature. More importantly, the current dissertation has the potential to inform the development of future culturally-adapted mHealth interventions for African American young adults. Next, the main findings from all three studies will be integrated and summarized, implications for clinical work with regard to culturally-adapted mHealth will be highlighted, and future directions for research will be presented.

### **Integrated Summary of Main Findings**

The first study explored the associations between experiences of online racial discrimination (ORD), racial identity, and psychological well-being among a sample of African American young adults. The first aim of the study was to explore if individual and vicarious experiences of ORD would be associated with higher levels of psychological distress for African American

young adults. The findings have added to the burgeoning literature on ORD (i.e., Keum & Miller, 2017), as it suggests that among African American young adults, vicarious experiences of ORD may be a better predictor of psychological distress (given the frequency of these experiences) as compared to individual ORD (i.e., being personally targeted with ORD).

Findings from study three highlight the pervasive nature of vicarious ORD:

Participant 22: And just a lot of times, especially when news articles are posted, people are so hateful. On Twitter and Facebook, people are just, so mean and so racist. Nobody's ever attacked me personally, but I remember one time there was an article posted after a protest and there was a picture of one of my friends and I think they had put a quote from her and people were on there like, "Somebody should kill her," like "She doesn't deserve to be at UNC, doesn't deserve to be blah blah blah ... " That made me upset. But I don't think anyone's ever attacked me specifically.

This quote highlights how vicarious ORD, especially for young adults in the context of predominately-White institutions and recent events surrounding college protests, may be more prevalent than individual ORD, as supported by findings from study one. Moreover, it also highlights how these experiences lead to negative emotional reactions (i.e., feeling “upset” or anger). The second aim of the study was to explore if racial identity beliefs would moderate the association between ORD and psychological well-being. Findings revealed that vicarious ORD was associated with psychological distress, but only for those with certain levels of racial centrality and private regard beliefs (i.e., Sellers, Rowley, Chavous, Shelton, & Smith, 1997). More specifically, high levels of racial centrality and private regard protected against experiences of vicarious ORD and were associated with low levels of psychological distress. In contrast, these findings suggest that those with low levels of racial centrality may be at an increased risk for experiencing psychological distress as a result of vicarious experiences of ORD. Not only is this finding in line with extant research (e.g., Brondolo, Ver Halen, Pencille, Beatty, & Contrada, 2009; Neblett, Rivas-Drake, & Umana-Taylor, 2012; Tynes, Umana-Taylor,

Rose, Lin, & Anderson, 2012), qualitative findings from studies two and three also highlight how positive racial identity beliefs were related to participants' self-esteem and psychological well-being. It may also be that fewer positive racial identity beliefs (i.e., low racial centrality) may increase risk of experiencing psychological distress as a result of ORD.

The second study aimed to explore changes in racial identity and psychological distress in a sample of African American emerging adults. The first aim of this study was to explore if racial identity dimensions that are proposed to be stable change over time. The findings extend the theoretical assumptions of the Multidimensional Model of Racial Identity (MMRI) put forth by Sellers and colleagues (1997). More specifically, the findings suggested that in contrast to the assumptions of the MMRI, racial centrality, private regard, and nationalist ideology increased over time, whereas public regard, assimilationist ideology, humanist ideology, and oppressed minority ideology decreased over time. This may be due to the developmental context and significance of young adulthood for African Americans, in that they may be navigating unique contexts (i.e., predominately White institutions) or experiences (i.e., vicarious ORD) that are prompting changes in racial identity. In support of this idea, one of the key themes from study three suggested that African American young adults develop more positive racial identity beliefs during this developmental period as they learn how to succeed or develop self-efficacy (i.e., a sense of resilience) while coping with race-related stressors (i.e., feeling more proud of being Black because of succeeding despite adversities). Said another way, although others have noted that the developmental task of constructing a healthy identity may be an area of increased stress for African American young adults (Hurd et al., 2013), study three highlights that if young adults are able to navigate these race-related stressors, it may lead to positive racial identity beliefs.



The second study also aimed to explore if initial levels and changes in racial identity dimensions predicted changes in psychological distress among African American emerging adults. Of note, this study also contributes longitudinal evidence that supports the direct links between initial levels of racial regard (i.e., feelings about African Americans, how one believes others feel about African Americans) and changes in psychological well-being among African American emerging adults over a period of at least three years. African American young adults' affective beliefs about their race and how they believe they are perceived by others may influence their psychological well-being and/or coping skills. For instance, as highlighted by data in study three:

Participant 12: ...I feel like you have to think positive, cause the way you see your...racial group, I feel like, kinda looks like so how you see yourself, because you're part of that group. So, I feel like if you think negatively about your group as a whole, then it's like- it's kinda hard to not think negative about yourself. So ... Like, for example, if you think, like, "Oh, nobody in my racial group succeeds, like... if you believe that and, like, you don't feel like doing anything about it, or, like, prove that to other people, then it can, um, it can lead to you, like, not wanting to be that, like, you want to, uh, you, like, fall into the stereotype, which I feel like happens very often, which can affect your mental health, cause you could know, like, you could be better, but because it's, like, this is what happens, this stigma of, like, African Americans or any other racial group....

Taken together, in light of both studies two and three, racial regard may not only reflect individuals' perception of themselves (i.e., high private regard may be reflective of a positive self-image or pride in being Black), low public regard may also be viewed as an awareness of negative stereotypes about African Americans put forth by mainstream U.S. culture. These low public regard beliefs, as shown in study two, may be influencing decreases in psychological distress as they may be reflective of African American young adults' motivation and desire to succeed despite an awareness of these stereotypes or the stigma associated with their identity.

Finally, the primary aim of the third study was to utilize focus groups of African American young adults to broadly inform the design of future culturally-adapted mHealth interventions for

mental health. Of note, thematic analyses revealed a variety of features, content, and design considerations relevant to African American young adults that can guide the future development of such technologies. Participants also evaluated a sample of current mHealth technologies for mental health and provided invaluable feedback for tailoring/improving future evidence-based technologies. Findings from study three highlighted the unique risk and protective factors that influence mental health and mental health treatment seeking for this population. More importantly, study three highlighted that the novel findings from studies one and two (e.g., experiences of vicarious ORD, racial identity beliefs, etc.) may influence mHealth utilization. Additionally, given that participants repeatedly highlighted desiring resources related to coping with discrimination and exploring racial identity beliefs, findings from the first two studies can further inform the development of these technologies (discussed next).

### **Clinical Implications: Developing Culturally-Adapted mHealth Interventions**

As noted above, in order to be effective for African American young adults, culturally-adapted mHealth interventions must incorporate research related to sociocultural factors that influence the psychological well-being of this group. Participants in study three often noted how a key factor in increasing engagement and utilization of mHealth technologies will be ensuring that these technologies are continuously updated with novel research findings relevant to African American young adults. In line with this, findings from studies one and two offer unique insights into additional culturally-relevant content that should be integrated into mHealth.

First, study one highlights the importance of creating resources and methods for coping with experiences of vicarious ORD within culturally-adapted mHealth interventions. For instance, given the association between vicarious ORD and psychological distress, culturally-adapted mHealth should help users understand how these experiences of racial discrimination

may influence mental health symptoms, possibly through psychoeducation or presenting short, clear summaries of research studies (i.e., findings could be translated into short psychoeducational videos or vignettes). Additionally, in line with participants' feedback, mHealth should also help individuals process their emotional reactions to experiences of vicarious ORD (i.e., present vignettes that illustrate how other African American young adults have coped with ORD), provide affirmations (i.e., present positive quotes related to being Black), and also teach problem-solving skills or possible solutions related to encountering future experiences of vicarious ORD (i.e., blocking users that spread ORD, managing social media channels to filter out traumatic online videos of ORD).

Additionally, study one highlights how racial centrality and private regard may protect against vicarious ORD and lead to better psychological outcomes among African American young adults. As a result, culturally-adapted mHealth interventions should bolster racial centrality and private regard beliefs. For example, these interventions can offer racial identity assessments within the application, and for those with low levels of racial centrality or private regard, their profile can be tailored so that they are recommended resources (i.e., inspirational quotes about being Black) or activities (e.g., interventions that promote racial identity exploration), in an effort to promote positive changes in racial identity. Given the results of study two, these types of interventions should promote changes in racial identity beliefs given that longitudinal data suggest that these beliefs change over time.

In line with study two's findings, culturally-adapted mHealth should particularly target racial regard beliefs within applications, given that initial levels of these beliefs are linked to changes in psychological symptoms over time. As noted above, racial regard beliefs, or how African American young adults feel about themselves (as well as how they perceive how other racial

groups feel about/view them), may uniquely influence their self-esteem and self-image during this developmental period. As a result, mHealth should incorporate ways for individuals to reaffirm and explore their Black identity (i.e., minigames or short readings describing positive qualities of the Black experience). Moreover, mHealth should promote racial identity development, and the community forum or ability to discuss racial identity topics with other African American young adults may be one such feature that influences these changes.

Finally, study three offers a variety of implications specific to the development of future mHealth technologies, such as specific features, content, preferences desired by African American young adults. Though the study did not intend to offer recommended next steps for the development of a specific intervention, researchers can flexibly integrate the findings from the current study and overall dissertation with existing frameworks to facilitate the development of such technologies (i.e., Matthews, Doherty, Coyle, & Sharry, 2008). In fact, others often highlight that the initial phases of mHealth development require focus group research with the intended target (i.e., Matthews et al., 2008), so study three can be utilized by potential developers to facilitate the swift development of culturally-relevant mHealth.

Furthermore, it is important to note that of the affordable, available mHealth options that exist, very few, if any, culturally-adapted mHealth interventions currently exist for this group. Even more concerning, research shows that there are very few evidence-based mHealth options for mental health in general. For example, studies show that most mHealth applications are not evidence-based, with their development being driven by commercial and economic goals versus scientific contributions (Donker et al., 2013). In fact, at the time of this study, only one free culturally-adapted mHealth intervention was found available online (i.e., the Safe Place). Though it is culturally relevant, it is unclear if it was developed to incorporate evidence-based

interventions or activities. In support of this observation, findings from study three often highlighted how African American young adults desired for the Safe Place to incorporate more evidence-based resources and features that were found in apps such as the Mood Coach and STAIR (which are applications designed from evidence-based resources by the U.S. Department of Veteran Affairs). Taken together, there is an urgent need to not only design culturally-adapted mHealth in line with the recommendations highlighted in study three, but it is imperative that these technologies include evidence-based interventions in an effort to positively impact current disparities in access to and utilization of effective mental health services among this group.

### **Future Directions for Research**

In addition to clinical implications, findings from all three studies also highlight important future directions for research related to ORD, racial identity, and culturally-adapted mHealth interventions for African American young adults. First, current studies (i.e., Keum & Miller, 2017; Tynes et al., 2012) utilize survey methods to explore the impact of ORD on the psychological well-being of African American young adults. To further explicate the impact of ORD on this group, experimental methods should be utilized to explore how the intensity of ORD experiences impact psychological symptoms. For instance, experimental methods (i.e., Shelton & Sellers, 2003) that incorporate survey methods of racial identity, in combination with visual exposure to instances of ORD in laboratory settings with psychophysiological methods (i.e., measurement of autonomic responses), can further explicate ORD impacts African American young adults. More specifically, these methods can explore how racial identity beliefs moderate autonomic responses to ORD (i.e., Neblett & Roberts, 2013). Furthermore, although ORD is a frequent stressor for African American young adults, they still have to grapple with experiences of offline, or every day, racial discrimination. Going forward, it will be imperative

that researchers begin to highlight how both offline and ORD interact to influence the psychological well-being of African American young adults. Once these complex associations are explored, mHealth interventions should be tailored to aid this group in navigating and coping with both forms of racial discrimination.

Additionally, given that participants in both studies one and three reported high frequencies of vicarious ORD, researchers should also explore risk factors for experiencing ORD. For example, in study three, some participants highlighted how participating in activism (i.e., protesting against racist campus statues) led to more frequent experiences of ORD. This is particularly important to note given that samples in both studies one and three were majority African American young adult women, and emerging research shows that African American young adult women may engage in higher levels of activism online, which may make them even more susceptible to ORD (i.e., McArthur, 2016). Additionally, vicarious ORD depicting African American women as victims of police violence has risen over recent years (i.e., Brown, Ray, Summers, & Fraistat, 2017), which may have made these experiences even more distressing for the current samples. Going forward, understanding these risk factors (e.g., political activism, gender identity) can help designers of culturally-adapted mHealth tailor interventions to help African American young adult activists and/or women better prepare for these experiences.

Finally, findings from study one also highlight the need for more accurate measures of ORD. For instance, current measures of ORD only explore exposure to certain experiences (i.e., “being called a racist term online” or “being shown a racist image online”), and were created before the immense rise in popularity of current social media applications (initial validation studies were published in 2010). Going forward, items that better assess being exposed to more current forms of ORD unwillingly (i.e., retweets of racist tweets or pictures, etc.) are warranted. For example,

given the nature of social media, it could be that African American young adults are repeatedly exposed to a variety of traumatic events, such as police shootings of unarmed Black men, which may compound the negative effects that this type of ORD has on one's psychological well-being. In fact, a study that utilizes novel items to assess ORD by the current author suggests that for African American youth, more frequent exposure to such traumatic events online are associated with higher levels of PTSD (Tynes, Willis, Stewart, & Hamilton, 2019). Measures of ORD also do not take into account specifically *where* these experiences are occurring online. For example, some social media sites that afford more anonymity (i.e., Yik Yak), may also be online contexts where ORD is more prevalent given the absence of social controls, such as monitors or moderators (Tynes, Reynolds, & Greenfield, 2004). Given the evolving nature of social media, future measures should explore how to accurately assess ORD on both mainstream (i.e., Twitter & Facebook), and more underground/anonymous platforms (i.e., Yik Yak, 4Chan, etc.).

Furthermore, as highlighted in study two, there may be a variety of experiences that prompt changes in racial identity during emerging adulthood. In fact, one of the key findings from study three highlighted how experiences of racial discrimination and an awareness of negative stereotypes often led to positive racial identity beliefs and a sense of "resiliency". As a result, future research should explore how experiencing and navigating race-related stressors may prompt changes in racial identity beliefs over time. These studies should be longitudinal and utilize large, heterogeneous samples of African American youth and young adults.

There is also a dearth of information on the effectiveness of evidence-based mHealth interventions (i.e., Donker et al., 2013; Mohr et al., 2013). Studies also show that the effectiveness of technological interventions can vary depending on the format of the intervention (i.e., videoconferencing has been shown to be more effective as compared to online support

groups as a primary intervention, Mohr et al., 2013). In light of this, once culturally-adapted mHealth interventions are created, researchers should conduct randomized-control trials to evaluate these applications in an effort to improve their effectiveness and begin to disseminate the most effective interventions. It is important to consider that African American young adults in this sample desired for culturally-adapted mHealth to have the option to utilize professional assistance (though they did not perceive this to be a requirement for mHealth to be effective). They also noted that *not* having this option was a weakness of some current mHealth applications. In light of this limitation, future research should explore if culturally-adapted mHealth as a primary intervention is as effective, or even more effective, as compared to culturally-adapted mHealth that is used in conjunction with a mental health provider (e.g., Benzeev, Brian, Aschbrenner, Jonathan, & Steingard, 2018; Chan, Torous, Hinton, & Yellowlees, 2014). Finally, in regards to all three studies, there is an urgent need for future studies of ORD, racial identity, and mHealth to utilize more heterogenous populations of African American young adults. The majority of participants in all three samples were either college students or college-educated, yet community-dwelling African American young adults who did not attend college and/or who are currently in the workforce may have different types of ORD experiences, different levels of racial identity beliefs, and different views toward mHealth treatments.

### **Conclusion**

As the clinical and research implications highlight, the current dissertation offers a myriad of next steps that have the potential to push the field of clinical psychology in exciting, new directions. Specifically, by combining culturally-relevant research with the promise of delivering psychological services through mHealth technologies, the current findings can both advance our understanding of African American psychology and reduce disparities in mental healthcare



among African American young adults.

## REFERENCES

- Agency for Healthcare Research and Quality. (2013). *National healthcare disparities report*. Retrieved from <http://www.ahrq.gov/research/findings/nhqrdr/nhdr13/chap2-txt.html#fig231>
- Ben-Zeev, D., Brian, R. M., Aschbrenner, K. A., Jonathan, G., & Steingard, S. (2018). Video based mobile health interventions for people with schizophrenia: Bringing the “pocket therapist” to life. *Psychiatric Rehabilitation Journal*, *41*(1), 39–45. <https://doi.org/10.1037/prj0000197>
- Brondolo, E., Ver Halen, N. B., Pencille, M., Beatty, D., & Contrada, R. J. (2009). Coping with racism: A selective review of the literature and a theoretical and methodological critique. *Journal of Behavioral Medicine*, *32*(1), 64–88. <https://doi.org/10.1007/s10865-008-9193-0>
- Brown, M., Ray, R., Summers, E., & Fraistat, N. (2017). #SayHerName: a case study of intersectional social media activism. *Ethnic and Racial Studies*, *40*(11), 1831–1846. <https://doi.org/10.1080/01419870.2017.1334934>
- Chan, S., Torous, J., Hinton, L., & Yellowlees, P. (2014). Mobile Tele-Mental Health: Increasing Applications and a Move to Hybrid Models of Care. *Healthcare*, *2*(2), 220–233. <https://doi.org/10.3390/healthcare2020220>
- Donker, T., Petrie, K., Proudfoot, J., Clarke, J., Birch, M. R., & Christensen, H. (2013). Smartphones for smarter delivery of mental health programs: A systematic review. *Journal of Medical Internet Research*, *15*(11), 1–13. <https://doi.org/10.2196/jmir.2791>
- Hurd, N. M., Sellers, R. M., Cogburn, C. D., Butler-Barnes, S. T., & Zimmerman, M. A. (2013). Racial identity and depressive symptoms among Black emerging adults: the moderating effects of neighborhood racial composition. *Developmental Psychology*, *49*(5), 938–50. <https://doi.org/10.1037/a0028826>
- Keum, B. T. H., & Miller, M. J. (2017). Racism in digital era: Development and initial validation of the perceived online racism scale (PORS v1.0). *Journal of Counseling Psychology*, *64*(3), 310–324. <https://doi.org/10.1037/cou0000205>
- McArthur, S. (2016). Black Girls and Critical Media Literacy for Social Activism. *English Education*, *48*(4), 362.
- Neblett, E. W., Rivas-Drake, D., & Umaña-Taylor, A. J. (2012). The Promise of Racial and Ethnic Protective Factors in Promoting Ethnic Minority Youth Development. *Child Development Perspectives*, *6*(3), 295–303. <https://doi.org/10.1111/j.1750-8606.2012.00239.x>
- Neblett, E. W., & Roberts, S. O. (2013). Racial identity and autonomic responses to racial discrimination. *Psychophysiology*, *50*(10), 943–953. <https://doi.org/10.1111/psyp.12087>

- Sellers, R. M., Rowley, S. A. J., Chavous, T. M., Shelton, J. N., & Smith, M. A. (1997). Multidimensional Inventory of Black Identity: A preliminary investigation of reliability and construct validity. *Journal of Personality and Social Psychology*, *73*(4), 805–815. <https://doi.org/10.1037/0022-3514.73.4.805>
- Tynes, B., Reynolds, L., & Greenfield, P. M. (2004). Adolescence, race, and ethnicity on the Internet: A comparison of discourse in monitored vs. unmonitored chat rooms. *Journal of Applied Developmental Psychology*, *25*(6 SPEC. ISS.), 667–684. <https://doi.org/10.1016/j.appdev.2004.09.003>
- Tynes, B. M., Umaña-Taylor, A. J., Rose, C. A., Lin, J., & Anderson, C. J. (2012). Online racial discrimination and the protective function of ethnic identity and self-esteem for African American adolescents. *Developmental Psychology*, *48*(2), 343–355. <https://doi.org/10.1037/a0027032>
- Tynes, B. M., Willis, H. A., Stewart, A. M., & Hamilton, M. W. (2019). Race-Related Traumatic Events Online and Mental Health Among Adolescents of Color. *Journal of Adolescent Health*, *65*(3), 371–377. <https://doi.org/10.1016/j.jadohealth.2019.03.006>
- U.S. Department of Health and Human Services Office of Minority Mental Health. (2016). *Mental health and African Americans*. Retrieved from <http://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=24>
- Zickuhr, K., & Smith, A. (2012). *Digital differences*. Retrieved from <http://pewinternet.org/Reports/2012/Digital-differences.aspx>

## APPENDIX A: TABLES AND FIGURES FOR STUDY 1

*Table A1. Correlation Matrix of Main Study Variables*

	1	2	3	4	5	6	7	8
1. Age	-							
2. Gender	0.00	-						
3. Mother's Education	0.00	0.26*	-					
4. SNS Mean	0.05	-0.25	0.08	-				
5. Individual ORD	-0.03	-0.20	-0.08	0.20	-			
6. Vicarious ORD	-0.11	-0.23	0.00	0.08	0.35**	-		
7. Racial Centrality	0.03	-0.19	0.07	0.19	0.31**	0.32**	-	
8. Public Regard	0.00	0.32**	0.05	-0.12	-0.14	-0.20	-0.26	-
9. Private Regard	0.09	0.12	0.08	-0.02	-0.07	0.05	0.34**	0.17
10. Assimilationist Ideology	-0.05	0.07	0.06	-0.05	-0.19	-0.05	-0.09	0.55**
11. Humanist Ideology	0.04	.37**	0.05	-0.17	-0.34	-0.24	-0.53	0.54**
12. Oppressed Minority Ideology	0.01	0.09	0.15	0.02	0.08	-0.04	-0.18	0.14
13. Nationalist Ideology	0.00	0.17	0.12	-0.02	-0.18	-0.13	-0.30	0.45**
14. Psychological Distress	0.06	-0.25	-0.02	0.29**	0.08	0.09	-0.02	-0.28
<i>M</i>	21.07	-	-	2.16	1.39	3.26	5.52	3.97
<i>SD</i>	0.71	-	-	0.67	0.52	1.5	1.21	1.03

*Note.* \* Correlation is significant at the 0.05 level (2-tailed). \*\* Correlation is significant at the 0.01 level (2-tailed).

*Table A1. Continued*

9	10	11	12	13	14
-					
0.16	-				
0.31**	0.40**	-			
0.08	0.14	0.25*	-		
0.11	0.69**	0.62**	0.51**	-	
-0.01	-0.31	-0.04	0.14	-0.12	-
5.17	5.75	4.48	4.74	4.76	0.45
0.61	1.09	1.08	1.16	0.92	0.37

*Note.* \* Correlation is significant at the 0.05 level (2-tailed). \*\* Correlation is significant at the 0.01 level (2-tailed).

Table A2. Summary of Multiple Regression Analysis Predicting Psychological Distress From Vicarious ORD, Racial Centrality, and Covariates ( $N = 90$ )

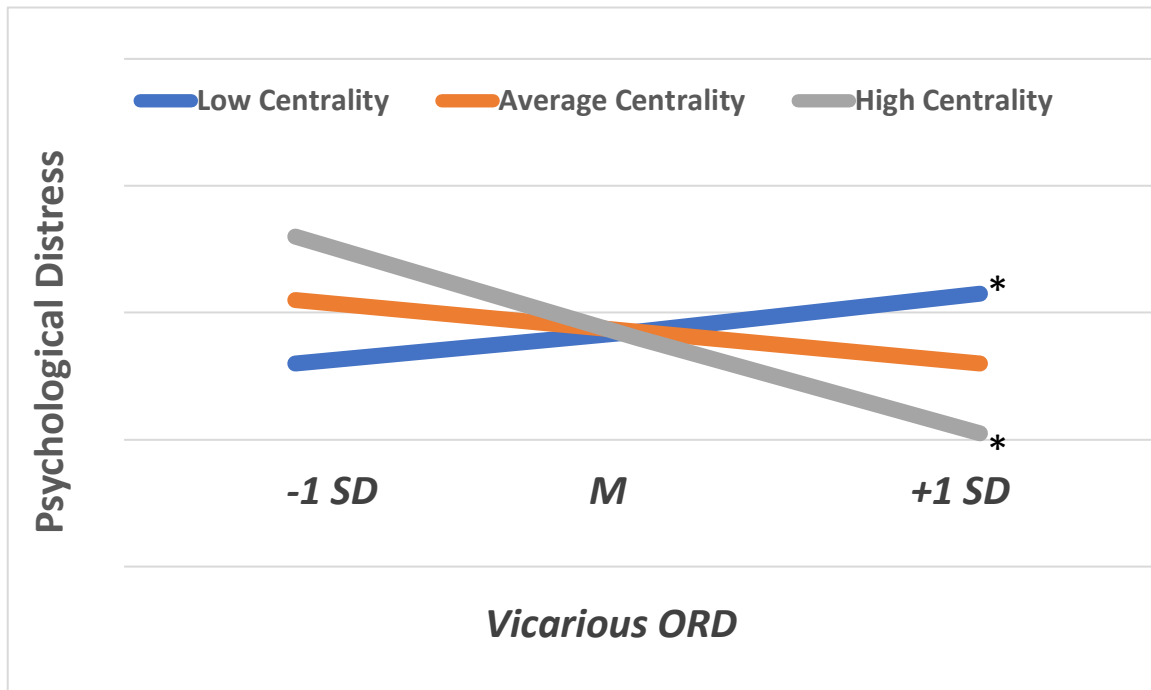
Variable	$B$	SE	$\beta$
Intercept	-0.069	0.138	
Age	-0.009	0.06	-0.014
Gender	-0.304	0.103	-0.323*
Mother's Education	0.014	0.031	0.048
SNS Mean	0.11	0.065	0.176
Vicarious ORD	-0.012	0.031	-0.044
Racial Centrality	-0.035	0.039	-0.102
Vicarious ORD x Racial Centrality	-0.052	0.023	-0.243*

**Note.** \* $p < .05$ ; \*\* $p < .01$ ;  $B$  = unstandardized regression coefficient; SE = standard error of the coefficient;  $\beta$  = standardized coefficient

*Table A3.* Summary of Multiple Regression Analysis Predicting Psychological Distress From Vicarious ORD, Private Regard, and Covariates ( $N = 90$ )

Variable	<i>B</i>	SE	$\beta$
Intercept	-0.127	0.139	
Age	-0.013	0.06	-0.022
Gender	-0.279	0.104	-0.296
Mother's Education	0.003	0.031	0.012
SNS Mean	0.126	0.064	0.202*
Vicarious ORD	-0.013	0.029	-0.046
Private Regard	0.089	0.067	0.132
Vicarious ORD x Private Regard	-0.093	0.041	-0.227*

**Note.** \* $p < .05$ ; \*\* $p < .01$ ; *B* = unstandardized regression coefficient; SE = standard error of the coefficient;  $\beta$  = standardized coefficient



*Note.* ORD = online racial discrimination; SD = standard deviation; M = mean. \*  $p \leq .05$

*Figure A1.* The association between vicarious ORD and psychological well-being was significant and negative for those with high Racial Centrality, and significant and positive for those with low Racial Centrality.





*Note.* *ORD* = online racial discrimination; *PR* = private regard; *SD* = standard deviation; *M* = mean. \*  $p \leq .05$

*Figure A2.* The association between vicarious ORD and psychological well-being was significant and negative for those with high Private Regard

## APPENDIX B: TABLES AND FIGURES FOR STUDY 2

*Table B1*

Means and Standard Deviations of Primary Study Variables

Variables	Wave 1 <i>M (SD)</i>	Wave 2 <i>M (SD)</i>	Wave 3 <i>M (SD)</i>	Wave 4 <i>M (SD)</i>	Wave 5 <i>M (SD)</i>
1. Centrality	4.76 (1.34)	4.80 (1.22)	4.92 (1.15)	5.24 (1.22)	5.53 (1.22)
2. Private Regard	5.88 (1.00)	5.72 (1.24)	5.79 (1.18)	5.98 (1.17)	6.23 (0.89)
3. Public Regard	3.20 (1.10)	3.18 (1.16)	3.17 (1.06)	3.01 (1.20)	2.77 (1.21)
4. Assimilationist	6.17 (0.88)	6.13 (0.80)	6.05 (0.81)	5.87 (1.02)	5.75 (1.10)
5. Humanist	5.54 (1.12)	5.50 (0.98)	5.36 (0.94)	4.89 (1.17)	4.46 (1.08)
6. Oppressed Minority	4.94 (1.34)	5.00 (1.10)	4.99 (1.05)	4.91 (1.16)	4.73 (1.17)
7. Nationalist	3.46 (0.93)	3.62 (0.97)	3.99 (1.07)	4.32 (1.18)	4.62 (1.15)
8. Psychological Distress (GSI)	0.76 (0.48)	0.62 (0.47)	0.57 (0.44)	0.48 (0.39)	0.47 (0.38)

*Table B2*

Correlations among Racial Identity Variables and Psychological Distress\*

*Note.* Given the size of Table B2, it is included in supplementary files available upon request.

Table B3  
Latent Growth Models of Key Study Variables

<i>Variable</i>	<i>Intercept</i>	<i>Variance of Intercept</i>	<i>Slope</i>	<i>Variance of Slope</i>	<i>Model Fit Indices</i>
Centrality	4.63**	1.36**	.18**	.04**	$\chi^2(14) = 20.27$ , CFI = .98, TLI = .99, RMSEA = .05
Private Regard	5.71**	1.2**	.09**	.02*	$\chi^2(10) = 17.27$ , CFI = .97, TLI = .97, RMSEA = .07
Public Regard	3.284**	.8**	-.09**	.02	$\chi^2(14) = 26.84^*$ , CFI = .94, TLI = .96, RMSEA = .07
Assimilationist	6.2**	.28**	-.10**	.02	$\chi^2(10) = 13.95$ , CFI = .94, TLI = .94, RMSEA = .05
Humanist	5.74**	.42**	-.25**	.01	$\chi^2(10) = 14.65$ , CFI = .96, TLI = .96, RMSEA = .05
Oppressed Minority	5.05**	.70**	-.06*	.02	$\chi^2(14) = 12.39$ , CFI = 1.0, TLI = 1.01, RMSEA = .00
Nationalist	3.40**	.70**	.25**	.02*	$\chi^2(14) = 20.71$ , CFI = .97, TLI = .98, RMSEA = .05
Psychological Distress (GSI)	.69**	.18**	-.06*	.003*	$\chi^2(14) = 24.83$ , CFI = .96, TLI = .97, RMSEA = .07

Note. CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA = root-mean-square error of approximation. \* $p < .05$ . \*\* $p < .001$ .

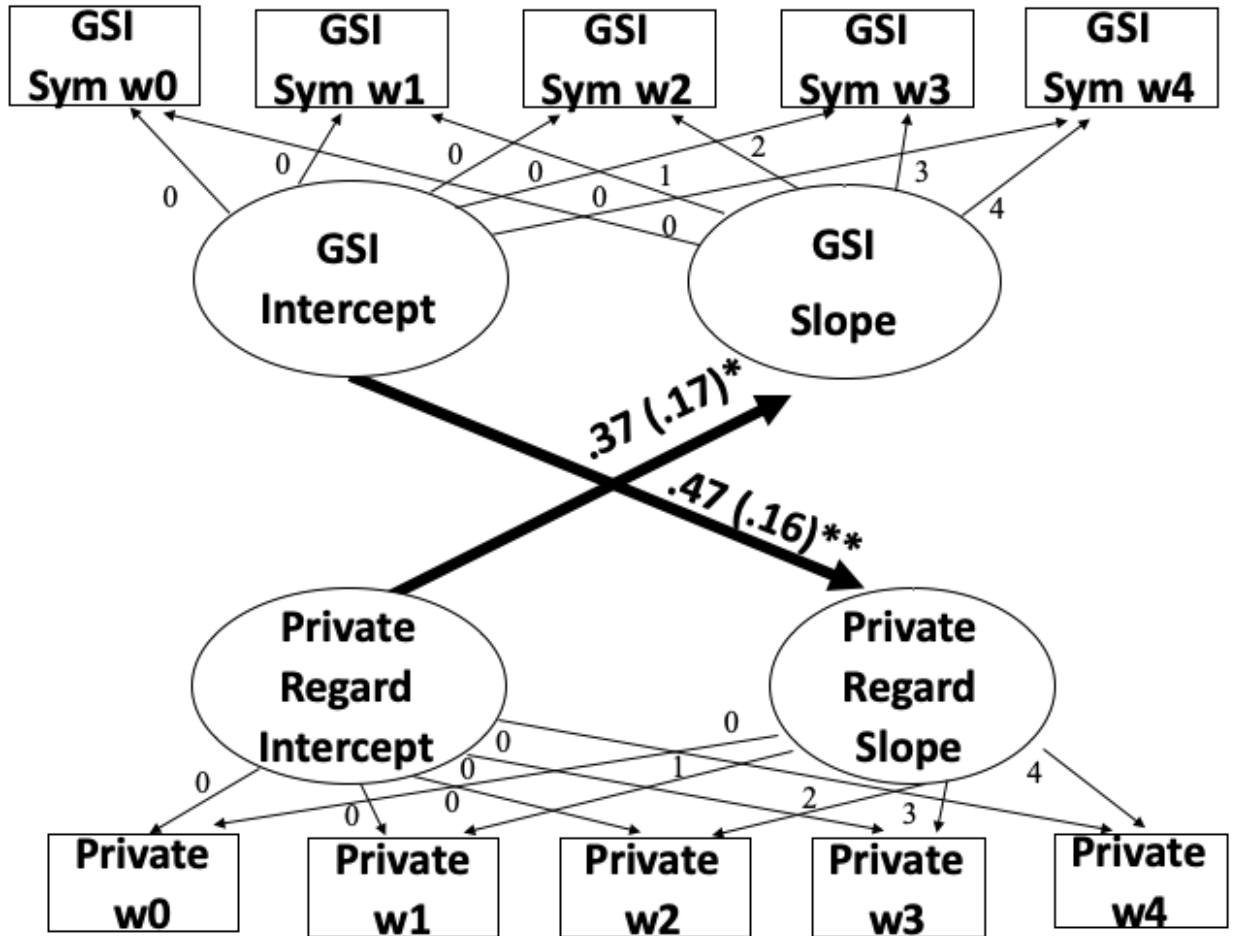


Figure B1. Latent Growth Model of Private Regard and the Global Severity Index score (GSI; Psychological Distress). Model includes standardized coefficients, with standard errors in parentheses. Not shown in the figure are paths from gender, age, and maternal educational attainment to all intercepts and slope factors. Correlations among exogenous variables, intercepts, corresponding intercept and slope factors, and disturbances of slope factors also are not included in the figure. Solid lines represent significant paths, and dashed lines represent nonsignificant paths. w = wave; \* =  $p < .05$ ; \*\* =  $p < .01$ .

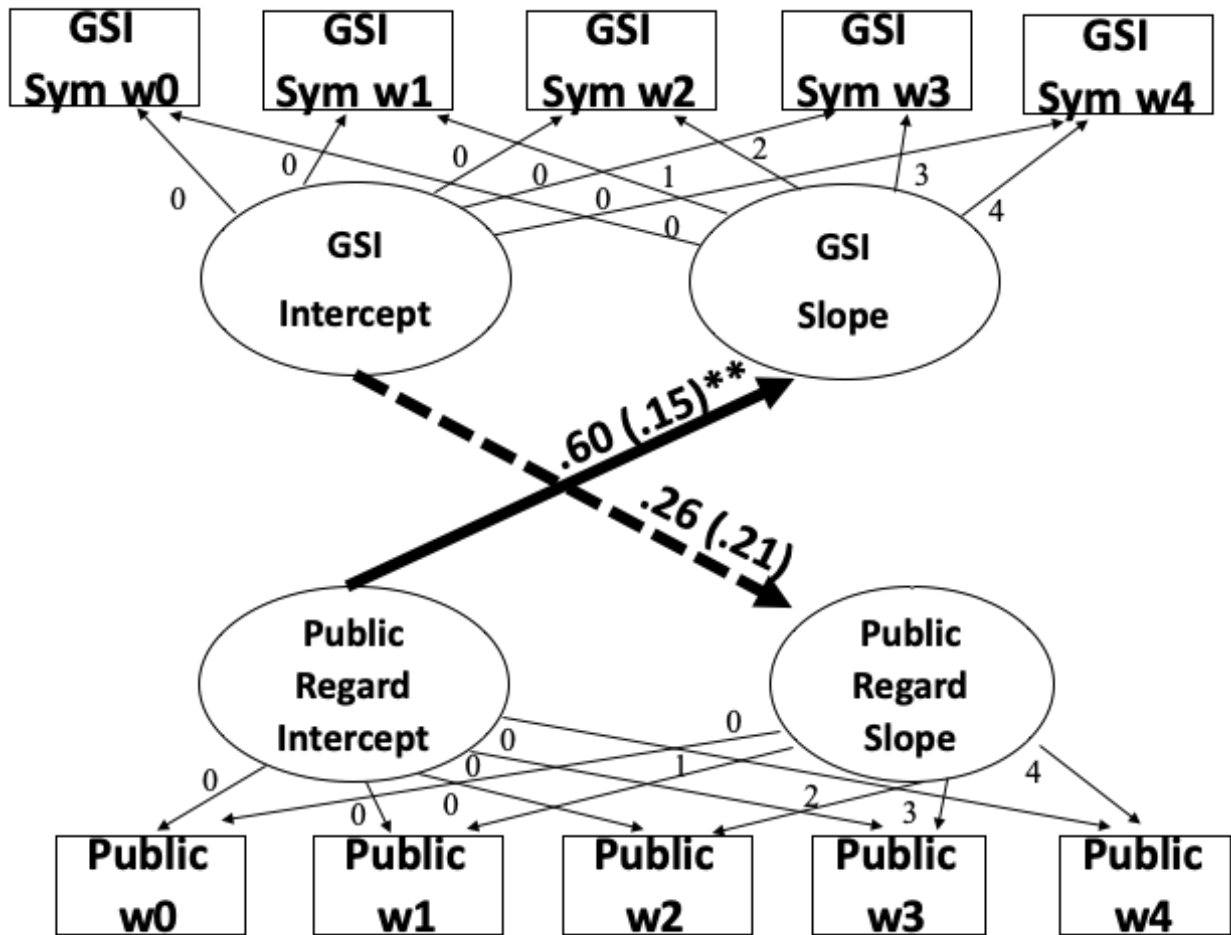


Figure B2. Latent Growth Model of Public Regard and the Global Severity Index score (GSI; Psychological Distress). Model includes standardized coefficients, with standard errors in parentheses. Not shown in the figure are paths from gender, age, and maternal educational attainment to all intercepts and slope factors. Correlations among exogenous variables, intercepts, corresponding intercept and slope factors, and disturbances of slope factors also are not included in the figure. Solid lines represent significant paths, and dashed lines represent nonsignificant paths. w = wave; \*\* =  $p < .001$ .

## APPENDIX C: SEMI-STRUCTURED FOCUS GROUP GUIDE FOR STUDY 3

### 1. Perceptions of Mental Health and Mental Health Treatments

- a. What is your perception/interpretation of mental health:
  1. What does it mean to have good/positive mental health?  
Negative/bad mental health?
  2. Do you think mental health is different for African Americans versus White Americans? What about African Americans versus other racial/ethnic minority groups?
  3. What are the expectations, pressures, advantages and disadvantages of being African American that can contribute to your state of mental health?
- b. How do you currently talk about mental health?
  1. Do you think African Americans talk about mental health differently?
  2. Do you talk about mental health with your friends? Family?
- c. How can we help ourselves and each other promote positive mental health and increased understanding of mental health issues?
  1. What activities do you engage in that promote positive mental health?
- d. Is there sufficient support for friends and family members of those affected by (severe) mental health issues?
- e. ***FOR THIS NEXT QUESTION, YOU DO NOT HAVE TO SHARE ANYTHING CONFIDENTIAL OR PERSONAL:*** When searching for treatments and assistance dealing with mental health symptoms, what are current routes that you are aware of.
  1. What barriers/obstacles get in the way of finding help for mental health symptoms?

### 2. Racial Identity and Coping with Race-Related Stress

- a. What do you know about racial identity?
  - i. We describe racial identity as the significance of race in your life. In other words, what does it mean to be an African American, and what are your beliefs about how African Americans should act.
- b. How does what you think about what it means to be a member of your racial group affect your mental health?
- c. How has your racial identity beliefs changed since you were a kid? Since you started at UNC?
- d. (Follow-up questions if there is time).
  - i. What can make you believe race is more central to how you see yourself? Less?

- ii. What can make you feel good about being black? Less?
- iii. Do you think others in society feel positively towards African Americans? What types of things would change this?
- iv. Do you think African Americans should try to find commonalities with mainstream American culture? What are examples of this?
- v. Do you think African Americans have similar experiences with other oppressed minority groups? How?
- vi. Do you think African Americans should try to get along with all people regardless of racial/ethnic background, or in other words, do you think people should not view others based on race, gender, etc.?
- vii. Do you think African Americans should emphasize the uniqueness of the black experience with little input from other groups (i.e., it's important to me to join all black organizations)?
- e. How have you dealt with experiences of racial discrimination?
  - i. Could you describe your feelings when you or SOMEONE YOU KNOW received unfair treatment because of your/their race?
  - ii. Have you/them experienced these things during face to face interactions, online (via social media), or both?
  - iii. Have these experiences of discrimination been related to mental health symptoms for you or someone you know?

### **3. Mental Health App for African Americans**

- a. If there was an app that promoted mental health in African Americans, what kinds of features should it have?
  - 1. Would you like treatment plan options? Activities? Notifications? Buddies?
  - 2. Would you want to share progress and/or resources on your social media networks (i.e., Facebook, Twitter)?
  - 3. Would you want the app to be connected to other apps? What about social media networks?
- b. Would you use the app to cope with negative mental health symptoms? Would you use the app alone or would you want to use it in combination with face-to-face therapy?
- c. What kinds of things would you want/need in it?
  - 1. What topics would you like to see addressed (i.e., depression, suicide)?
  - 2. What information do you need from a mobile app related mental health? (i.e., statistics, information about symptoms, access to providers)
- d. Would you want resources related to racial identity in a mental health app? What would this look like?
- e. Would you want resources related to coping with racial discrimination via an app? What would this look like?



- f. What do you think about these features?
  1. Location beacon/alert to check in on you during stressful times with connected friends on the app.
  2. Bitmoji integration.
  3. Ability to share resources with connected friends.
  4. Ability to find service providers
  5. Daily “what’s up?” feature where you put in mood, physical symptoms, thoughts, and tailored brief interventions for negative symptoms and then automatic referrals for if those interventions don’t work.
- g. What would motivate you to spend time on it?
- h. How should it be advertised? Where would you most likely find out about it?
- i. What would make it look attractive? (i.e., color schemes, etc.).

**4. Evaluating Current Mental Health Apps**

- a. Test Run of Selected Apps (~10 minutes) **REMIND PARTICIPANTS THEY CAN KEEP APPS OPEN DURING THE REST OF THE DISCUSSION.**
- b. What would improve some of the current apps that are available?
  1. CBT Coach, Stair App, Safe Space App, Mood Coach
  2. Which apps did you like the most? The least? Why?
  3. What features did you like and not like?
  4. Were there any things about the color schemes or how the app operates/runs that were attractive? Unattractive?
  5. What would make the apps more accessible to African Americans like yourselves?

**5. Any last thoughts about the apps or any other topic we discussed today?**

## APPENDIX D: TABLES AND FIGURES FOR STUDY 3

*Table D1.* Correlation Matrix of Key Study Variables

Variable	1	2	3	4	5	6	7
1. Age	-						
2. Gender	0.15	-					
3. Socioeconomic Status	-.47**	.52**	-				
4. Offline Racial Discrimination	-0.09	-0.10	0.27	-			
5. Individual Online Racial Discrimination	.34*	-0.04	-0.31	0.32	-		
6. Vicarious Online Racial Discrimination	0.14	-0.31	-0.16	0.22	.53**	-	
7. Racial Centrality	-0.15	0.32	0.22	0.14	0.12	0.00	-
8. Private Regard	0.26	0.26	-0.21	-0.09	0.13	-0.03	0.16
9. Public Regard	-0.10	0.23	0.00	-0.13	-0.01	-0.19	-0.04
10. Assimilationist Ideology	-0.25	0.03	0.26	-0.13	-0.20	0.09	0.17
11. Humanist Ideology	-0.05	0.13	0.20	0.32	0.13	0.07	-0.07
12. Oppressed Minority Ideology	-0.12	0.05	0.18	0.07	-0.13	-0.16	0.09
13. Nationalist Ideology	0.29	0.05	-0.16	-0.01	0.30	0.27	0.31
14. Attitudes towards Mental Health Treatments	0.21	0.09	-0.07	-0.11	-0.02	0.32	0.27
15. Appropriateness of Utilizing mHealth	0.11	0.05	0.07	-0.08	-0.12	0.14	0.12
16. Desire for Culturally-Adapted mHealth	-0.05	0.09	0.08	-0.18	-0.02	.35*	0.30
<i>M</i>	20.70	1.44	2.89	2.61	1.71	4.20	6.01
<i>SD</i>	2.61	0.94	0.86	0.92	0.58	1.21	0.73

*Note.* \* Correlation is significant at the 0.05 level (2-tailed). \*\* Correlation is significant at the 0.01 level (2-tailed).

*Table D1. Continued*

8	9	10	11	12	13	14	15	16
-								
0.32	-							
-0.27	0.08	-						
-0.09	-0.02	0.27	-					
-0.12	0.20	0.25	-0.02	-				
0.10	-0.12	0.07	-.49**	-0.01	-			
.39*	-0.14	0.26	-0.27	-0.14	.47**	-		
.44**	-0.02	0.20	-0.15	-0.19	0.32	.77**	-	
.33*	-0.10	.418*	-0.11	-0.04	.36*	.76**	.74**	-
6.59	3.26	5.93	4.41	4.80	5.31	6.11	5.89	6.35
0.67	1.01	0.84	0.77	0.92	0.70	0.75	0.75	0.60

*Table D2. Overview of Themes related to African American Young Adults' Perceptions of Race, Race-Related Stressors, Mental Health, and Mental Health Treatment Seeking*

Themes	Summary
1. "Feeling like everyone expects you to fail is exhausting."	Participants described the myriad of ways that social and cultural stressors and expectations that are unique to African Americans lead to psychological distress, maladaptive coping symptoms, and feelings of isolation.
2. "Being Black is lit."	Participants described the ways in which experiences of discrimination and social support from same-race peers can lead to increased feelings of racial pride. They also described that positive racial identity beliefs are linked to overall psychological well-being. Finally, participants highlighted that social support and a strong connection to same-race peers may also influence positive attitudes towards mental health and seeking mental health treatments.
3. "Drink Tea and Pray"	Participants highlighted how a lack of education around mental health and mental health services has led to a lack of awareness and understanding about mental health and mental health treatments, which subsequently decreases the likelihood of utilizing traditional services. More importantly, this lack of education influences maladaptive socialization messages received from family members related to how individuals understand and cope with psychological distress.
4. "Doors are open for White people."	Participants described how cultural and structural factors (e.g., reduced stigma, increased education about mental health) may contribute to disparities in utilizing mental healthcare between White and African American young adults.
5. "The only Black person I saw was the receptionist."	Participants described how systemic barriers to utilizing mental health services (i.e., financial barriers), in combination with a lack of providers of color and perceived lack of culturally relevant services, often contributes to decreased utilization of mental health services among African American young adults.

*Table D3. Features, Preferences, and Content for Culturally-Adapted mHealth Interventions*

Category	Key Features/Topics/Preferences & Considerations
1. Desired Features	<p>Inspirational Quotes</p> <p>Mediation/Deep Breathing Exercises</p> <p>Minigames</p> <p>Forums/Discussion Boards</p> <p>Resources</p> <p>Journaling Options</p> <p>Recommendations</p> <p>Personalization/Profile Options</p> <p>Psychological Assessments</p> <p>Racial Identity Resources</p> <p>Racial Discrimination Resources</p>
2. Desired Topics and Content	<p>Racial Identity &amp; Race-Related Stress</p> <p>Stress &amp; Psychological Symptoms</p> <p>Suicide</p> <p>Bullying, Puberty, &amp; Self-Esteem</p> <p>Coping with the Mental Health Effects of Social Media</p> <p>Coping Strategies</p> <p>Self-Care Strategies</p> <p>Communication/Destigmatizing Strategies</p> <p>Religion/Spirituality Resources</p>
3. Application Utilization Preferences and Considerations	<p>mHealth applications should ensure anonymity and confidentiality.</p> <p>Applications should be able to be used as a primary intervention, as well as an adjunct to in-person psychotherapy</p> <p>Applications should be provided in a variety of software formats (e.g., web-based, iOS, Android, etc.).</p> <p>mHealth should be useful for both recovering from psychological distress <i>and</i> maintaining psychological well-being/preventing serious distress.</p> <p>Moderators should enforce application rules and remove "trolls".</p> <p>Applications should be free to download.</p> <p>Applications should have the ability to connect to other technologies, but have limited social media connections.</p> <p>Developers should use creative strategies to advertise mHealth for mental health (e.g., promotional challenges, testimonials/reviews).</p> <p>Developers can use a variety of strategies to encourage motivation and continued use of mHealth (e.g., notifications, novel content, sharing the app with others).</p>

Table D4. Participants' Evaluations of Current mHealth Interventions

Application Name	Number of Positive Endorsements*	Number of Negative Endorsements*	Positive Feedback	Negative Feedback
CBTi	3	10	Psychoeducation	Unappealing Layout
			Notifications	Lack of Accountability Lack of Culturally-Relevant Resources
				No Professional Assistance
Mood Coach	22	1	Self-Assessments	Overwhelming
			Recommendations	Lack of Accountability Lack of Culturally-Relevant Resources
			Appealing Layout	No Professional Assistance
			Psychoeducation Notifications Goal Setting	
The Safe Place	25	5	Cultural Relevancy	Unappealing Layout
			Inspirational Quotes	Overwhelming
			Popular Media	Lack of Evidence-Based Resources/Features
			Community Forums Recommendations Psychoeducation	No Professional Assistance
STAIR	13	2	Self-Assessments	Overwhelming Lack of Culturally Relevant Resources
			Appealing Layout	No Professional Assistance
			Psychoeducation Notifications	
			Deep Breathing Goal Setting	

Note. \*Endorsements = Number of times "liked" or "disliked" was coded for participants' overall experience/feedback with an application