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ACCEPTANCE

This dissertation, A PRELIMINARY INVESTIGATION INTO THE MEDIATING ROLE OF POSITIVE AFFECT IN THE DEVELOPMENT OF POSTTRAUMATIC STRESS DISORDER AMONG AFRICAN AMERICAN FEMALE SEXUAL ASSAULT SURVIVORS, by MAHOGANY L. SWANSON, was prepared under the direction of the candidate's Dissertation Advisory Committee. It is accepted by the committee members in partial fulfillment of the requirements for the degree, Doctor of Philosophy, in the College of Education, Georgia State University.

The Dissertation Advisory Committee and the student's Department Chairperson, as representatives of the faculty, certify that this dissertation has met all standards of excellence and scholarship as determined by the faculty. The Dean of the College of Education concurs.

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ABSTRACT

A PRELIMINARY INVESTIGATION INTO THE MEDIATING ROLE OF POSITIVE AFFECT IN THE DEVELOPMENT OF POSTTRAUMATIC STRESS DISORDER AMONG AFRICAN AMERICAN FEMALE SEXUAL ASSAULT SURVIVORS

by

Mahogany Lois Swanson

Sexual assault and the resulting impact within the African American community continues to be an under researched phenomenon (Bryant-Davis, Chung, & Tillman, 2009). Although positive affect was presented as a protective model within the general population (Fredrickson, 1998), empirical research exploring its potential for use within the African American community is sparse. The objective of this study was to investigate the mediating role of positive affect in the development of Posttraumatic Stress Disorder (PTSD) post sexual assault in African American women, within an economically disadvantaged community. Thus, this study tested the hypotheses that Positive Affect (PA) would mediate the effects of sexual assault occurring before age 13 (FSC < 13), between ages 14 and 17 (FSC 14-17), and after age 17 (FSC > 17) on PTSD related symptoms (MPSS). Data from 749 African American were analyzed. A bias-corrected bootstrapping analysis revealed that PA mediated the effect of FSC < 13 on MPSS, 95% CI [.418, 1.778]. The indirect effect of PA accounted for 12.3% of the effect of FSC < 13 on MPSS. A second bias-corrected bootstrapping analysis revealed that PA mediated the effect of FSC 14-17 on MPSS, 95% CI [.671, 2.344]. The indirect effect of PA accounted for 14.8% of the effect of FSC 14-17 on MPSS. A third bias-corrected bootstrapping analysis revealed that PA mediated the effect of FSC > 17 on MPSS, 95% CI [.741, 2.568]. The indirect effect of positive affect accounted for 14.0% of the effect of FSC > 17 on MPSS. The results of this study suggest that women who are higher in positive affect are less likely to endorse symptoms related to PTSD post sexual assault,

while those presenting with lower levels of positive affect are more likely to endorse PTSD related symptoms post sexual assault. The results of these analyses appear to be consistent with Fredrickson's (1998) theory that positive affect enhances psychological resources for the individual.

A PRELIMINARY INVESTIGATION INTO THE MEDIATING ROLE OF POSITIVE
AFFECT IN THE DEVELOPMENT OF POSTTRAUMATIC STRESS DISORDER
AMONG AFRICAN AMERICAN FEMALE SEXUAL ASSAULT SURVIVORS

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Mahogany Lois Swanson

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ABBREVIATIONS

APA	American Psychiatric Association
DSM	Diagnostic and Statistical Manual of Mental Disorders
FSC	Forced Sexual Contact
MPSS	Modified PTSD Symptom Scale
PA	Positive Affect
PANAS	Positive and Negative Affect Scale
PTSD	Posttraumatic Stress Disorder
TEI	Traumatic Events Inventory

CHAPTER 1

THE BROADEN AND BUILD MODEL, A PROPOSED MODEL OF RESILIENCY FOR USE WITHIN THE AFRICAN AMERICAN COMMUNITY AMONG INDIVIDUALS IDENTIFIED AT-RISK FOR THE DEVELOPMENT OF PTSD

The purpose of this paper is to introduce the *broaden and build model* developed by Fredrickson (1998) as a partial explanation for the observed resiliency in African Americans at risk for the development of Posttraumatic Stress Disorder (PTSD). Previous names for PTSD include “Soldier’s Heart” during the Civil War, “Shellshock” during WWI, “Battle Fatigue” during WWII, “Railroad Spine” during Europe’s 19th century railroad crashes, and “Vietnam Syndrome” during the Vietnam War (Marmar, 2009). Although PTSD is not a new phenomenon, there continues to be a dearth of research examining trauma exposure within the African American community (Alim, Charney, & Mellman, 2006; Brunello et al., 2001), juxtaposed to the increased risk for exposure to traumatic life events and the subsequent development of PTSD within low-income African American communities (Alim et al., 2006; Liebschutz et al., 2007).

According to the DSM IV-TR, a traumatic life event occurs when a person witnesses or experiences death, serious injury or an assault on his or her personal integrity (American Psychiatric Association, 2000). The DSM V extends this definition to include learning about the occurrence of an event with a close friend or family member or if experienced first-hand through repeated exposure to aversive details of the event (American Psychiatric Association, 2013). Unfortunately, African Americans within economically disadvantaged, urban communities are at increased risk for exposure to traumatic life events and the subsequent development of PTSD (Alim et al., 2006; Liebschutz et al., 2007). However, exposure to traumatic events will not necessarily lead

to a PTSD diagnosis (Carr et al., 2013). According to Taylor, Kemeny, Reed, Bower, and Gruenewald (2000), mechanisms may serve to dampen the effects of trauma exposure and preclude the development of mental health pathologies such as PTSD. The *broaden and build model* developed by Fredrickson (1998) may serve as an explanation for the resiliency seen in all trauma survivors and more specifically, identify a protective mechanism in use within low-income African American communities. Furthermore, this model may highlight a possible mechanism by which to screen those at greater risk for the later development of PTSD within this community (Liebschutz et al., 2007).

African Americans at Risk for the Development of PTSD

As stated previously, African Americans within economically disadvantaged, urban communities are at increased risk for exposure to traumatic life events and the subsequent development of PTSD (Alim et al., 2006; Liebschutz et al., 2007). This is consistent with the findings reported by Breslau, Davis, Andreski, and Peterson (1991), who found risk in the African American community to be significantly higher than for European Americans in the same health maintenance organization and urban community (Breslau et al., 1991). In another study conducted by Alim et al. (2006), 65% of 617 primary care patients (96% African American) presented with at least one traumatic event, of whom, 51% met criteria for PTSD at least one time in their respective lives. The most common traumas included transportation accidents (42%), unexpected deaths (39%), physical assault (30%), assault with a weapon (29%) and sexual assault (25%). According to the authors, the rates of PTSD within the African American population were as high as 33-45% (Alim et al., 2006) and increased in the African American female population (Alim et al., 2006; Bassuk & Buckner, 1998).

In addition to being African American (Breslau et al., 1991) and female (Bassuk & Buckner, 1998) childhood experiences of trauma emerged as a significant risk factor for the later development of PTSD among African Americans (Bradley, Schwartz, & Kaslow, 2005; Gillespie et al., 2009). This finding is particularly relevant given the prevalent rates of both violent and non-violent traumatic events experienced by African American youth (Jenkins, Wang, & Turner, 2009). Interestingly, Hood and Carter (2008) found that African American women who experienced both adult and childhood abuse tended to report significantly less PTSD related symptoms than those participants who endorsed adult trauma alone. The authors hypothesized that early exposure to trauma may have taught the survivors to perceive the world less naively and the survivors developed hardiness, which served as a protective factor when exposed to adult trauma. Conversely, according to a literature review conducted by Briere and Jordan (2004) women who experienced childhood abuse tended to experience the effects of subsequent traumas more intensely. The authors reported that the effects of compounding traumas might be viewed as additive, which is especially concerning given the increased risk for multiple traumas within the African American community (Jenkins et al., 2009).

Poverty also appears to elevate the risk for the later development of PTSD. According to Bryant-Davis, Ullman, Tsong, Tillman, and Smith (2010), after controlling for exposure to childhood sexual trauma, poverty emerged significantly and positively linked to PTSD, as well as depression and drug use. Honeycutt (2001) further substantiated the link between financial burden and PTSD in a study conducted with 836 disadvantaged women. In his study, a significant relationship between receiving food stamps and victimization, such as rape, domestic abuse and psychological abuse emerged.

Briere and Jordan (2004) further found prostitution and poverty to elevate the risk of victimization. In addition, Gapen et al. (2011) found the perception of community cohesion, social control, and social order to be significantly related to PTSD in a sample of 615 majority African American individuals residing in a low-income urban community. However, beyond risk for the development of PTSD, what is known regarding PTSD in this population continues to be inadequate due to under diagnosis, disclosure rates and other factors.

For instance, according to Liebschutz et al. (2007), 23% of their 509 adult research participants (59% African American) met criteria for clinical PTSD; however, only 11% of these had PTSD denoted in their medical charts, indicating vast under diagnosis of PTSD. Additionally, in an exploratory analysis conducted by Ullman, Starzynski, Long, Mason, and Long (2008), the authors found that when compared to Whites, ethnic minorities were less likely to report incidences of assault. Furthermore, Jacques-Tiura, Tkatch, Abbey, and Wegner (2010) investigated the effects of trauma disclosure in women from a metropolitan area and found that when compared to White participants, African American women experienced greater negative responses from formal service providers, and significantly so when the disclosures were relevant to their PTSD symptoms. However, these findings are contrasted with those of Hien and Bukszpan (1999), who noted that their African American research participants were more likely than those in a national sample to disclose trauma histories.

Regardless of the rates of PTSD within the African American community, the associated risks of possessing a PTSD disorder are real. PTSD has been linked to problematic drinking (Littleton & Ullman, 2013), opiate drug use (Schwartz et al., 2006)

and substance dependence (Wilcox, Storr, & Breslau, 2009) within African American communities. According to Wilcox et al. (2009), PTSD is associated with increased risk for suicide attempts for African American women, above comorbid problems such as substance abuse, dependence, and depression. In a study conducted by Weiss et al. (2011), a PTSD diagnosis significantly increased the risk for the later development of metabolic syndrome, even after controlling for other health factors such as smoking, exercise and antipsychotic drug use among an African American sample. In their study, metabolic syndrome was linked to greater rates of both diabetes and cardiovascular disease. According to the literature, when compared to European Americans, African Americans experience greater rates of both cardiovascular disease (Swift et al., 2013) and diabetes (Jeff et al., 2014), which is associated with increased medical health concerns, including death. Additionally, in a study conducted by Campbell, Greeson, Bybee, and Raja (2008) with 268 African American female veterans, PTSD was linked to significant complaints of pain, and fully mediated the relationship between health complaints and violence.

In summary, although trauma exposure does not necessarily result in a diagnosis of PTSD (Carr et al., 2013), the increased risk within the African American community (Alim et al., 2006; Liebschutz et al., 2007), as well as the comorbid mental health and medical health problems associated with this disorder (Campbell et al., 2008; Littleton & Ullman, 2013; Schwartz et al., 2006; Weiss et al., 2011; Wilcox et al., 2009), point to the need to identify individual characteristics which may dampen the effects of trauma exposure. According to Taylor et al. (2000), such protective mechanisms may preclude the development of mental health pathologies.

The Broaden and Build Model

According to Pat Horenchuk and Brom (2007) people are equipped with unique coping styles, which serve to protect the individual from developing mental health disorders (Taylor et al., 2000). Depending on the effectiveness and utility of these mechanisms, they can either result in diminished ability, absolute recovery, or the individual transcending his or her baseline ability (Norlander, Schedvin, & Archer, 2005). As stated previously, the *broaden and build model* developed by Fredrickson (1998) may serve as an explanation for the resiliency seen in low-income African American communities and highlight a possible mechanism by which to screen those at greater risk for the development of PTSD (Liebschutz et al., 2007).

According to the *broaden and build model*, positive affect facilitates resiliency via the expansion of psychological, cognitive, physical and social resources (Fredrickson, 1998, 2001). This model builds on the idea that the effects of positive affect results in enhanced optimism and cognitive flexibility (Isen & Daubman, 1984). In this model, people who see and are open to positive interpretations are more likely to acknowledge and utilize available resources, such as social, physical, cognitive and psychological supports. This model appears culturally relevant for African American communities due to the reported increased accessibility of social resources, which is an important identified protective mechanism within the African American community (Comas-Díaz & Greene, 1994; R. J. Taylor, Chatters, Tucker, & Lewis, 1990).

Specifically, people who are high in positive affect experience better social support seeking behavior (Aspinwall & Tedeschi, 2010), greater social support accessibility (Fredrickson, 1998), and greater social support satisfaction (Karlsson &

Archer, 2007). In effect, as it relates to social supports, the *broaden and build model* describes a process whereby a person's social supports are broadened via social support seeking behavior, and then built upon via social support accessibility and social support satisfaction. This is consistent with a study conducted by Webb Hooper, Baker, and McNutt (2013), who found adaptive coping to be associated with both social supports and positive affect in African Americans. Religiosity is another quintessential coping mechanism within the African American (Shannon, Oakes, Scheers, Richardson, & Stills, 2013). Interestingly, Holt et al. (2011) found positive affect to completely mediate the relationship between religious behavior and emotional processing with 100 African American men and women presenting with cancer, further demonstrating the cultural relevance of the *broaden and build model* (Fredrickson, 1998) to the African American community.

However, it is important to note that positive affect is not a panacea for all mental health concerns. According to Held (2004)

if people feel bad about life's many difficulties and they cannot manage to transcend their pain no matter how hard they try (to learn optimism), they could end up feeling even worse; they could feel guilty or defective for not having the right (positive) attitude, in addition to whatever was ailing them in the first place (p.12)

Additionally, Aspinwall and Tedeschi (2010) report that positive affect is moderated by the severity of the traumatic event, and does not necessarily result in beneficial outcomes. Furthermore, negative outcomes have been identified to be associated with positive affect, including increased engagement in risky behavior,

decreased longevity (Grant & Schwartz, 2011), impulsivity (DeYoung, 2010), attention to relevant information (Forgas, 2001), and decreased effort on tasks (Melton, 1995). However, these findings are contrasted with the findings of Derryberry and Tucker (1994), who found positive affect to increase awareness to adverse self-relevant information.

Additionally, the *broaden and build model* has largely been a theoretical model, with very few empirical studies (Lyubomirsky, 2000) investigating its utility. Furthermore, the few research studies that have attempted to provide empirical support for the *broaden and build model* have depended mainly on undergraduate students within the general population as research participants (Burns et al., 2008; Schiffrin & Falkenstein, 2012), making generalization to other communities difficult.

However, regardless of the potential for negative effects and limited studies evidencing the utility of the *broaden and build model* empirically, positive affect appears to be a viable protective mechanism (Affleck & Tennen, 2006; Aspinwall & Taylor, 1997; Folkman, 1997; Fredrickson, 1998) within the African American community, due to the resulting access to resources, which in turn may buffer the individual against the later development of PTSD. Fredrickson (1998) identified these resources as social, cognitive, physical and psychological. What follows is a précis of the protective effects of positive affect as it relates to the aforementioned resources (Fredrickson, 1998) and their relevance to those in the African American community at risk for the development of PTSD.

Social Supports

As stated previously, the *broaden and build model*, via positive affect, increases social support seeking behavior (Aspinwall & Tedeschi, 2010), greater social support accessibility (Fredrickson, 1998), and greater social support satisfaction (Karlsson & Archer, 2007). According to the literature, the African American community places a greater importance on kinship and collaboration than European Americans, who rely more heavily on mental health services (Bradley et al., 2005; Comas-Díaz & Greene, 1994; Heron, Twomey, Jacobs, & Kaslow, 1997; R. J. Taylor et al., 1990). This finding is consistent with the findings of Utsey, Bolden, Lanier, and Williams (2007), who examined the role of culture specific coping among African Americans living in an economically disadvantaged community using Structural Equation Modeling. In their study, family, community, kinship networks, and religiosity all emerged preferable over other types of coping.

Additionally, Constantine, Alleyne, Caldwell, McRae, and Suzuki (2005) evidenced the importance of social support within the African American community in a study in which African American volunteers relied more heavily on social supports to cope with the aftermath of September 11. In a study conducted by Schumm, Briggs-Phillips, and Hobfoll (2006), African American childhood experiences of abuse and rape, combined with a lack of perceived social support significantly increased a women's likelihood of later developing PTSD and clinical depression. These findings are consistent with the findings reported by Bradley et al. (2005) and Gillespie et al. (2009). Furthermore, use of social support in a sample of 413 African American women coping with sexual assault was linked with decreased symptoms of both PTSD and depression (Bryant-Davis, Ullman, Tsong, & Gobin, 2011). In another study, perceived

social support from friends and family emerged as a protective factor against suicide attempts (Thompson, Kaslow, Short, & Wyckoff, 2002), which is important given the findings of Wilcox et al. (2009), where PTSD was linked to increased risk for suicide attempts for African American women, above comorbid problems such as substance abuse, dependence, and depression.

Given the importance of social support within the African American community, factors that promote the accessibility of social support appear particularly relevant. According to the *broaden and build model* (Fredrickson, 1998), this is a key effect of positive affect. Additionally, research indicates that increases in social relationships are linked to lower levels of stress hormones, decreased heart rate and blood pressure, decreases in cholesterol level and improved overall immune support (Olf, 2012; Sherman, Kim, & Taylor, 2009). Given the findings of Weiss et al. (2011) where a PTSD diagnosis significantly increased the risk for the later development of metabolic syndrome in an African American sample, positive affect presents as an important protective quality.

Physical

In addition to the effect of positive affect on social supports, positive affect is theorized to increase access to physical resources Fredrickson (1998). For example, positive affect was found to buffer the effects of chronic stress (Folkman, 1997; Folkman & Moskowitz, 2000; Lazarus, Kanner, & Folkman, 1980) and cardiovascular related problems (Tugade & Fredrickson, 2004). This appears particularly relevant to the African American community, where Weiss et al. (2011) found PTSD to be directly linked to the development of metabolic syndrome and subsequent cardiovascular disease

and diabetes within an economically disadvantaged African American community (Weiss et al., 2011). Additionally, positive affect was linked to enhanced immune functioning and decreased harmful cardiac reactivity (Aspinwall & Tedeschi, 2010). Furthermore, Aspinwall and Tedeschi (2010) found positive affect to enrich health practices and increased the individual's attention to health related information.

Cognitions

In addition to physical benefits and social support accessibility, positive affect can improve access to cognitive resources, including greater cognitive flexibility (Isen & Daubman, 1984), which is said to counter the effects of negative emotions (Fredrickson, 1998). Positive affect can also lead to enhanced imagination (Isen, Daubman, & Nowicki, 1987), innovative thinking (Fredrickson, 1998), mental organization (Ashby, Isen, & Turken, 1999), and openness to new possibilities (Kahn & Isen, 1993). This is contrasted with negative affect, which is said to arouse the autonomic nervous system and can result in a narrowed cognitive repertoire (Fredrickson, Tugade, Waugh, & Larkin, 2003). Although potentially adaptive, in that a narrowed cognitive repertoire facilitates a quick response in dangerous situations, it can become maladaptive when generalized to non-hostile environments, leading to hypervigilance (Fredrickson et al., 2003), which is also hallmark feature of PTSD (American Psychiatric Association, 2013).

Positive affect was also linked to mental efficiency (Isen & Means, 1983), integrative behavior (Isen, Rosenzweig, & Young, 1991), and mental curiosity (Fredrickson et al., 2003). Furthermore, rather than result in avoidance to negative situations, positive affect facilitates awareness to adverse information (Derryberry & Tucker, 1994; Isen, 1990; Reed & Aspinwall, 1998; Trope & Neter, 1994; Trope &

Pomerantz, 1998). Given one of the hallmark features of PTSD is avoidance (American Psychiatric Association, 2013; Foa & Kozak, 1986), increased facilitation of attention to adverse experiences appears particularly relevant to a population significantly at risk for the development of PTSD (Alim et al., 2006; Liebschutz et al., 2007).

Psychological

Undoing hypothesis. Lastly, in addition to increased accessibility to social, physical and cognitive resources, and particularly relevant for a high trauma exposed African American community, is the effects of positive affect on an individual's psychological well-being. According to Fredrickson (1998), positive affect may undue the aversive effects of negative emotions by restoring flexible thinking after exposure to a negative experience, and may speed recovery from fear, sadness and anxiety (Fredrickson, 1998) via a process termed the *undoing hypothesis* (Fredrickson, 1998, p. 313). This effect was supported in a study conducted by Riskind, Kleiman, and Schafer (2013), where positive affect protected against the effects of negative affect, and ultimately the development of depression in individuals. This is important given the aversive effects of experiencing negative affect. For example, possessing a negative affect style can result in a negative attribution style, whereby an individual wrongly attributes blame to him or herself, or falsely remembers the role that significant others played in an event. This can exacerbate symptoms related to PTSD (Ehlers & Clark, 2000), since negative cognitions are key symptoms of PTSD according to the DSM V (American Psychiatric Association, 2013).

Positive affects facilitative role in the *undoing hypothesis* is also important in that people manifesting a negative affect style generally experience greater sensitivity and

tend to interpret situations negatively (Gemzøe Mikkelsen & Einarsen, 2002), resulting in greater distress. Furthermore, negative affect is associated more with fatalism (Aspinwall & Tedeschi, 2010). According to Aspinwall and Tedeschi (2010), fatalists tend to engage in riskier behaviors such as unsafe sexual practices, suicide attempts and physical confrontations. Additionally, people manifesting a negative affect style tend to be more critical of themselves (Watson & Clark, 1984). Lastly, Archer, Adolfsson, and Karlsson (2008) found negative affect to be associated with anger, shame, fear, guilt, and depression, which in turn predicted both general and psychological stress, depression and anxiety (Archer et al., 2008).

Upward spiral. Besides the *undoing hypothesis*, positive affect is also associated with an *upward spiral* (Garland et al., 2010), where reciprocated positive experiences accumulate and are experienced as a resource in times of adversity (Fredrickson, 2001) and protection from fearful and dysphoric states (Garland et al., 2010). This is contrasted with the downward spiral of depression, where experiences of depression can result in more experiences of depression. This *upward spiral*, or accumulation of adaptive resources, results in a broadening of coping abilities, which in turn results in even more positive emotions (Fredrickson & Joiner, 2002). These findings are substantiated by Fredrickson et al. (2003), who found positive emotions to be the key protective factor in the development of depression for individuals post September 11. According to their study, positive affect mediated the relationship between accessibility of psychological resources and resilience.

Positive affect also emerged as a protective factor during times of adversity (Affleck & Tennen, 2006; Aspinwall & Taylor, 1997; Folkman & Moskowitz, 2000; S.

E. Taylor et al., 2000), which is particularly relevant for this paper given the increased risk for trauma exposure within the low-income, African American, urban community (Liebschutz et al., 2007).

Conclusion

According to the literature review, rates of trauma exposure and the subsequent development of PTSD among low income, urban, African American communities continue to be higher than among European American communities (Alim et al., 2006; Breslau et al., 1991; Liebschutz et al., 2007). Among African Americans, trauma exposure and the presence of PTSD have been linked to mental health and medical health problems including problematic drinking (Littleton & Ullman, 2013), opiate drug use (Schwartz et al., 2006), substance dependence and increased risk for suicide attempts (Wilcox et al., 2009), metabolic syndrome, diabetes and cardiovascular disease (Weiss et al., 2011). Conversely, positive affect, as it is described in the *broaden and build model* (Fredrickson, 1989), may present as a viable buffer against the development of PTSD in the African American community. Positive affect is theorized to not only increase access to social resources, an important identified protective resource within the African American community, but also expand physical, intellectual, and psychological resources (Fredrickson, 1998; Fredrickson, 2001).

As the purpose of the current paper was to explore the effects of both PTSD and trauma exposure within the African American community and to introduce the *broaden and build model*, developed by Fredrickson (1998), as a possible protective model in the development of PTSD. The clinical applications of this model are now discussed.

Clinical Application

Screening for risk factors in the development of PTSD is an important first step for mental health professionals working with individuals at risk for exposure to traumatic life events, due to the potential for negative health outcomes in this population (Weiss et al., 2011; Wilcox et al., 2009). This paper, though, has suggested that a part of that screening might include a measure of positive affect. For instance, Watson, Clark, and Tellegen (1988) developed the Positive and Negative Affect Schedule (PANAS), a 20-item self-report measure, to screen for both positive and negative trait affect. Both negative and positive items are rated as 1 (very slightly/ not at all) to 5 (extremely). Positive affect items include feeling interested, excited, strong, enthusiastic, proud, alert, inspired, determined, attentive, and active. The PANAS was used in a study by Merz et al. (2013) with an African American sample, and demonstrated an internal reliability score of .88.

Therefore, mental health providers working with African Americans living in low-income urban communities at risk for the development of PTSD, due to the higher risk for trauma exposure, may find it beneficial to include the PANAS in their intake in order to better identify those at risk. According to Watson and Walker (1996) the PANAS measurement of positive affect demonstrates temporal stability for over a period of 7.5 years and is considered as a good measurement of trait affect (Watson & Walker, 1996). By screening clients using the PANAS, individuals presenting lower in positive affect can then be identified and steps taken to address positive affect, and thus resiliency in these individuals.

However, according to Fredrickson (2000), positive emotions cannot be directly induced in an individual. Instead, therapists must take steps to cultivate positive

emotions in their clients' respective lives. One method of cultivating positive affect presented by Fredrickson (2000) includes facilitating meaning making. As reported by Fredrickson (2000), affording individuals with increased experiences of competence, significance, achievement, involvement and social connectedness can help facilitate meaning making, and subsequently lead to the cultivation of positive affect.

Folkman and Moskowitz (2000) described another method of facilitating meaning making. According to the authors, engagement in leisure activities and daily life events can lead to a discovery of values, exposure of positive experiences and a more developed sense of wellbeing. In a qualitative study conducted by Mattis (2002) with 23 African American women, meaning making was facilitated through the engagement of religious and spiritual practices. According to Mattis (2002), these practices assisted participants to accept reality, deal with existential questions, recognize personal purpose, learn to surrender, experience growth and transcend limitations.

In addition to using the facilitation of meaning making as a means to cultivate positive emotions (Fredrickson, 2000), cognitive behavior therapy also provides mechanisms by which positive emotions can be cultivated (Beck, 1995). As cited by the literature, techniques such as behavior activation and positive data logs are likely to promote positive emotions (Beck, 1995; Dunn, 2012). Additionally, therapists can identify and challenge distorted beliefs, which may hinder experiences of positive emotions (Dunn, 2012; Feldman, Joormann, & Johnson, 2008). However, Dunn (2012) provides a word of caution, in that people undergoing stressful life events may find it difficult to actively engage in positive events scheduling. According to Dunn (2012), mindfulness based approaches may assist the individual to focus on positive events

scheduling, rather than be distracted by negative past life experiences. Along this same line, Dunn (2012) recommends the engagement of multiple sensory domains, such as biofeedback and imagery, in the experience of positive affect. According to Dunn (2012), this may assist the client in processing positive information more fully. However, as with engagement in positive events scheduling, individuals who have experienced negative life events may find engaging in positive imagery difficult (Holmes, Coughtrey, & Connor, 2008).

In addition to facilitating meaning making (Fredrickson, 2000), cognitive behavioral therapy (Beck, 1995; Dunn, 2012), and biofeedback techniques (Dunn, 2012), engagement in physical activity may promote positive affect (Baker et al., 2008). In a study conducted by Baker et al. (2008) over a 12-week period, the promotion of physical activity using a pedometer based walking program led to significantly increased levels of positive affect. In conclusion, although positive affect may not preclude the development of PTSD, it does appear to present as a mechanism of resiliency in those individuals who possess it, therefore, promoting the presence of positive affect in those individuals identified as at-risk appears to be an important step in promoting resiliency.

Implications for Future Research

Although the *broaden and build model* (Fredrickson, 1998) presents as a viable and relevant model of resiliency for the African American community, research exploring the use of this model has generally been constrained to undergraduate students residing within the general population (Burns et al., 2008; Schiffrin & Falkenstern, 2012). Further, the *broaden and build model* relies heavily on theory for support, as very few attempts have been made to lend empirical support to the model (Lyubomirsky, 2000).

Thus, empirical research evaluating the effects of positive affect to enhance social, cognitive, physical and psychological resources among African Americans would be an important first step in evaluating the model's applicability to the African Americans residing in low-income urban communities.

Additionally, according to the literature, women survivors of childhood sexual abuse and adult sexual assault are at greater risk for the later development of Posttraumatic Stress Disorder (PTSD; Tolin & Foa, 2006). This risk increases for African American women residing within low-income urban communities (Alim et al., 2006; Liebschutz et al., 2007). However, little research exists identifying the mechanisms present in African American women, which may dampen the effects of sexual assault and preclude the later development of PTSD. Clearly then, empirical research investigating the possible role of positive affect in promoting resiliency would be an important next step in developing measures for both prevention and remediation of the development of trauma symptomology in this population.

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CHAPTER 2

A PRELIMINARY INVESTIGATION INTO THE MEDIATING ROLE OF POSITIVE AFFECT IN THE DEVELOPMENT OF POSTTRAUMATIC STRESS DISORDER AMONG AFRICAN AMERICAN FEMALE SEXUAL ASSAULT SURVIVORS

Posttraumatic Stress Disorder (PTSD) is a significant mental health and emotional health problem among African Americans. It has been linked to substance abuse, depression, suicide risk (Wilcox, Storr & Breslau, 2009), metabolic syndrome, diabetes, cardiovascular disease (Weiss et al., 2011), problematic drinking and opiate dependence (Schwartz et al., 2006) among African Americans. One of the greatest risk factors for PTSD according to a recent meta-analysis conducted by Tolin and Foa (2006) is sexual assault. This is especially concerning given the prevalence of sexual exposure within low-income, urban, African American communities.

According to Rennison and Welchans (2000), three in 1,000 African American women have been sexually assaulted. When relying on self-report measures, this rate was as high as 30% in community samples (Molitor, Ruiz, Klausner, & McFarland, 2000). According to Ramisetty-Mikler, Caetano, and McGrath (2007), the rates of sexual assault within the African American population is two times the rates experienced within the White community. Other studies have noted the rates of sexual assault for African American women to be comparable to the general population and at times lower than the general population (Bryant-Davis, Heewoon, & Tillman, 2009; Elwood et al., 2011). Regardless of racial identification, women survivors of childhood sexual abuse and adult sexual assault are at the greatest risk for the later development of PTSD (Tolin & Foa, 2006).

However, disclosure rates affect how we understand prevalence rates of sexual assault within the African American community. Although not always the case (Behnken, Le, Temple, & Berenson, 2010), African American women may be less likely to report incidences of sexual assault due to general and cultural specific factors (Neville & Pugh, 1997). This includes societal pressure to protect the image of African American men (Tillman, Bryant-Davis, Smith, & Marks, 2010), and feelings of self-blame and, or a fear of fulfilling stereotypical images of black women upheld in society (Tillman et al., 2010). In the study conducted by Jacques-Tiura, Tkatch, Abbey, and Wegner (2010), with 232 African American and European Americans, African Americans were significantly less likely than their White counterparts to disclose sexual assault. Additionally, African Americans were more likely to receive negative responses to their self-disclosure. These factors may impact disclosure rates, leading to an underestimation of the actual prevalence rate of sexual assault within the African American female community. Regardless of prevalence rates, sexual assault is the leading risk factor in the development of PTSD among women (Tolin & Foa, 2006).

There are several factors identified in the literature, which increase the opportunity for exposure to sexual assault. According to Tolin and Foa (2006), women are more likely to have experienced childhood sexual abuse and adult sexual assault within the general population. In addition, poverty (Bryant-Davis et al., 2009; Honeycutt, 2001; Scott, Lefley, & Hicks, 1993), incest, previous rape, site unfamiliarity, mental disability (Scott et al., 1993), crack cocaine use, marijuana use, alcohol use, drug injection, and prostitution (Kalicharan, Williams, Cherry, Belcher, & Nachimson, 1998; Molitor et al., 2000) all emerged as placing African American women in particular at

greater risk for exposure to sexual assault. Additionally, Bryant-Davis et al. (2009) found childhood experiences of sexual abuse to significantly predict adult experiences of sexual assault in a study conducted with an ethnically diverse sample of women, while Luthra et al. (2009) found sexual and physical abuse, among other factors, significantly related to PTSD in a sample of racially diverse adolescents.

Given the prevalence rates, risk factors, and the negative impact of sexual assault on African American female survivors of sexual assault, it is essential to identify mechanisms that may diminish the effects of sexual assault and preclude the development of PTSD. Unfortunately, little is known regarding the pathways through which trauma exposure leads to post assault psychological sequelae (Ullman, Peter-Hagene, & Relyea, 2014). Even less research exists exploring this causal link among African American women, residing in low-income urban communities. According to Ullman, Peter-Hagene, & Relyea (2014), certain emotional factors may help to explain the relationship between traumatic histories and the development of PTSD related symptoms. The main objective of the current paper is to investigate positive affect (PA) as a mediator in the relationship between sexual assault exposure and the later development of PTSD. According to Reuben, Baron, and Kenny (1986), “a successful mediator is caused by the independent variable and causes the dependent variable” (p.1177). It is hypothesized the PA will partially mediate the relationship between prior sexual assault exposure and the development of PTSD related symptoms.

Conceptual Overview of Positive Affect as a Mediator

According to Frazier, Tix & Barron (2004), an essential step in determining if mediation exists is first showing a conceptual link between the predictor and outcome

variable. This conceptual link has been verified in extant literature, where sexual assault has consistently demonstrated a significant and positive relationship with the later development of PTSD (Alim et al., 2006; Liebschutz et al., 2007; Luthra et al., 2009; Tolin & Foa, 2006).

The next step in testing mediation is “to show that the predictor is related to the mediator” (Frazier, Tix & Barron, 2004, p. 125), or for the purpose of this study, that sexual assault is related to positive affect. According to Tyler (2012), individuals experience changes in the way that they experience emotions subsequent to trauma exposure. Per the DSM-IV-TR, trauma exposure can result in the persistent inability to experience positive emotions (American Psychiatric Association, 2000) due to changes in the limbic system, which may lead to psychological numbing (Kolk & Saporta, 1991). In addition to decreases in one’s ability to experience positive emotions, negative emotional states may persist due to changes in the amygdala (Tyler, 2012)

The next step is “to show that the mediator is related to the outcome variable” (Frazier, Tix and Barron, 2004, p. 1250), or that positive affect is related to the later development of symptoms of PTSD. According to Fredrickson (1998), experiences of positive affect can result in a process termed the *undoing hypothesis* (Fredrickson, 1998, 2001), whereby positive emotions reverse the deleterious effects of negative emotions by speeding recovery from sadness, anxiety and fear post a stressful life event (Fredrickson, 1998; Riskind, Kleiman, & Schafer, 2013). Besides the *undoing hypothesis*, positive affect is also associated with an *upward spiral* (Garland et al., 2010). According to this theory, experiences of positive emotions are said to yield more positive experiences and the subsequent accumulation of positive emotions (Fredrickson, 2001; Fredrickson &

Joiner, 2002). This in turn assist individuals in bouncing back from fearful and dysphoric states (Garland et al., 2010), promoting resiliency during times of adversity (Affleck & Tennen, 2006; Aspinwall & Taylor, 1997; Folkman & Moskowitz, 2000; Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000). This suggests that positive affect can mediate the relationship between sexual assault exposure and PTSD related symptoms via its effects on both psychological numbing and experiences of negative emotions.

Rational for the Current Study

Sexual assault, and the resulting impact within the African American community, continues to be an under researched phenomenon (Bryant-Davis et al., 2009). However, little research exists identifying the mechanisms present in African American women, which may mediate the effects of sexual assault and preclude the later development of PTSD. Baron and Kenny (1986) state that, “mediators represent properties of the person that transform the predictor or input variables in some way” (p.1178). It is possible that positive affect, present or absent from the individual, may mediate individuals’ experiences of their trauma and subsequently can influence the development of PTSD symptoms.

Objective of the Current Study

Sexual assault and resulting impact within the African American community continues to be an under researched phenomenon (Bryant-Davis et al., 2009), while sexual assault remains one of the greatest predictors of PTSD (Tolin & Foa, 2006). The objective of the current paper is to investigate the mediating role of positive affect in the development of PTSD post sexual assault in African American women within an

economically disadvantaged community. To meet this objective, the following research question and hypotheses were developed:

- 1) Does positive affect mediate the relationship between sexual trauma and symptoms of PTSD in African American women?

H1a: Positive affect will mediate the relationship between childhood sexual abuse experienced before age 13 and symptoms of PTSD.

H1b: Positive affect will mediate the relationship between childhood sexual abuse experienced between ages 14 and 17 with symptoms of PTSD.

H1c: Positive affect will mediate the relationship between adult sexual experienced after age 17 and symptoms of PTSD.

Method

Participants

Data from 749 African American women recruited from waiting rooms of a primary care clinic and an obstetrics/ gynecology clinic of an inner-city hospital as part of a larger NIMH, Howard Hughes funded study, were analyzed. The hospital, located in the southeastern United States, serves primarily low-income, African-American patients. Individuals presenting with psychotic disorders and, or cognitive disabilities were excluded from the study.

Research participants were primarily unemployed (72.6%), with 54.6% reporting a household income of less than \$1,000 and 18.1% reporting receiving disability support. In all, 25% of the research participants reported less than a high school education, 37.9% either a GED or high school diploma, 26.8% indicated some college or technical school,

and 10.2% of the participants endorsed either a college or graduate school education. 17.8% of the 749 research participants indicated past drug or alcohol abuse, while 1.5% endorsed current substance or drug use.

Procedure

Undergraduate and graduate students approached potential research participants in waiting rooms of a primary care clinic and an obstetrics/ gynecology clinic of an inner-city hospital. Potential participants were offered \$15 to complete a variety of scales and self-report measures. Participants who endorsed psychotic disorders and, or cognitive disabilities were excluded from the study. Screeners were trained to conduct interviews through a variety of classes offered by trained students and post-doctoral clinicians. Interviewers were required to attend weekly meetings to discuss cases and assess for bad data. Bad data was defined as interviews that resulted in questionable response patterns. Bad or questionable data was removed from the data set.

Measures

In order to answer the research question, the following scales were used for the current study: the Traumatic Events Inventory, the Modified PTSD Symptom Scale (Falsetti, Resnick, Resick, & Kilpatrick, 1993) and the Positive and Negative Affect Schedule (Merz et al., 2013). The means, standard deviations and reliability coefficients are presented in Table A1.

Traumatic Events Inventory (TEI). The Traumatic Events Inventory (TEI; Gapen et al., 2011; Schwartz et al., 2005, 2006) is an instrument assessing lifetime history of traumatic experiences including experiencing, witnessing, and being confronted with these stressors. The research team developed this measure based off of

theoretical and contextual knowledge. The TEI is a structured interview consisting of 22 questions that ask whether a participant has experienced or witnessed common traumatic experiences (e.g., natural disasters, sudden life threatening illnesses, military combat exposure, interpersonal violence, intrapersonal violence, and accidents).

In the current study, only questions regarding forced sexual contact were utilized (Sexual contact before age 13 experienced, sexual contact between 14 and 17 with physical forced experienced, sexual contact after age 17 with physical force experienced). These three items demonstrated a low Cronbach alpha coefficient of .43. However, consistent with Schwartz et al. (2005), this measure was highly correlated with PTSD related symptoms yielding Pearson r 's ranging from .297 to .319 ($p < .001$), underscoring the validity of the measure.

Modified PTSD Symptom Scale (MPSS). The Modified Posttraumatic Stress Scale (MPSS) is a brief 17-item measure that diagnoses PTSD according to DSM-IV criteria and assesses severity of symptoms (MPSS; Falsetti et al., 1993). The format of the instrument follows the structure of symptoms in the DSM-IV. According to Bradley, Schwartz, and Kaslow (2005), the Modified PTSD Symptom Scale (MPSS) has good internal consistency, with a Cronbach alpha coefficient reported of .89. Consistent with their study, the current study demonstrated adequate internal reliability, with Cronbach alpha coefficient of .912.

Positive and Negative Affect Schedule (PANAS). The Positive and Negative Affect Schedule (PANAS) is a 20-item self-report measure of positive and negative affect traits rated as 1 (very slightly/ not at all) to 5 (extremely) (Merz et al., 2013). In the current study, only the positive affect items (i.e., interested, excited, strong, enthusiastic,

proud, alert, inspired, determined, attentive, and active) were used. According to Merz et al. (2013), the positive affect subscale of the PANAS demonstrates an internal reliability score of .88 with use in the African American community. This is consistent with the findings of the current study, which yielded a Cronbach alpha coefficient of .890. In investigating the temporal stability of the PANAS, Watson and Walker (1996) found both positive and negative affect to demonstrate moderate, but substantial stability over a period of 7.5 years. However, this research was conducted with an undergraduate student sample.

Data Analysis

A preliminary error analysis was conducted using descriptive statistics to assess for outliers and missing data. Additionally, the dependent variable and predictor variables were assessed for normality, linearity and homoscedasticity. Correlation analyses using the Pearson product-moment coefficient to determine the strength of the relationship between the dependent variable (MPSS) and forced sexual contact (FSC) at different stages of life, and between the dependent variable (MPSS) and positive affect (PA) were utilized.

Three separate simple mediation analyses as defined by Baron and Kenny (1986), and Hayes (2013) were used to test the hypotheses. The Baron and Kenny (1986) causal steps approach relies on 4 separate steps. In the first step, the researcher is tasked at demonstrating a significant relationship between the antecedent X variable and the consequent Y variable. Secondly, the researcher investigates if there is a significant relationship between the X variable and the M intermediary variable. Subsequently, the researcher is required to demonstrate a significant relationship between the M variable

and the dependent variable, after controlling for the independent variable. If each of the aforementioned steps emerges significant, the researcher will then compare the direct effects to total effects. If the direct effect of X on Y is closer to 0 than the total effect of X on Y, then mediation is said to exist.

However, since the Baron and Kenny (1986) process relies on inferences based on the rejection of several null hypotheses, rather than on the quantification of the indirect effect of the intermediary variable, bootstrapping was also employed to test if a significant indirect effect exists. Unlike the Baron and Kenny method, bootstrapping, as described by Hayes (2013), permits inferences to be made regarding the intermediary variable via actual estimates of the indirect effects. Additionally, given the causal steps approach is subject to low power, due to its heavy reliance on multiple hypotheses tests, the bootstrapping test, which requires a single test of the indirect effects was also employed.

Bootstrapping employs a procedure known as resampling, where it treats the n of a data set as a representation of the population being tested in miniature. Distinct observations are then made with this sample through resampling, using replacement. In the case of the present study, 10,000 random samples from the 749 research participants were selected to establish confidence intervals to evaluate the significance of the direct and indirect effects. Mediation is said to exist when the indirect effect emerges significantly different from zero, employing a bias-corrected 95% confidence interval (Hayes, 2013).

Lastly, given mediation models utilizing highly correlated multiple independent variables run the risk of canceling out the independent effects of the antecedent variable, three separate mediation models were employed (Hayes, 2013).

Results

All statistical procedures were performed using the Statistical Package for the Social Sciences (SPSS), Version 20.0. In order to compute the mediation analysis, the PROCESS macro by Hayes was utilized (Hayes, 2013). According to Fritz and MacKinnon (2007), a sample size of 462 is needed in order to achieve power of .80 with $p < .05$ and four predictor variables. Results of this investigation are based on 749 participants.

Preliminary Analyses

Prior to running ordinary least squares simple mediation analyses, preliminary analyses were conducted to determine descriptive statistics and to test the dependent and predictive variables for normality, linearity and homoscedasticity. Based on the preliminary analysis, each of the variables demonstrated linearity; however, the assumptions for normality and homoscedasticity were violated. However, according to Hayes (2013), bootstrapping does not impose distributional assumptions. Furthermore, in order to manage homoscedasticity present in the data, the heteroscedasticity-consistent standard error estimator available in the PROCESS SPSS macro (HC3; Hayes, 2013) was employed. The results of the descriptive statistics for MPSS, PA, and FSC at all stages of life are presented in Table A2.

Primary Analyses for Hypotheses Testing

Pearson Product Moment Correlation Coefficient

The strength of the relationships between FSC, MPSS and PA was investigated using the 2-tailed Pearson product-moment correlation coefficient. MPSS emerged positively correlated with forced sexual contact prior to age 13 (FSC < 13), $r = .319$, $n = 749$, $p < .001$; as well as with forced sexual contact between ages 14 and 17 (FSC 14-17), $r = .297$, $n = 749$, $p < .001$; and with forced sexual contact after age 17 (FSC > 17), $r = .305$, $n = 749$, $p < .001$. The relationship between MPSS and PA emerged negatively correlated, $r = -.350$, $n = 749$, $p < .001$. PA emerged negatively correlated with FSC < 13, $r = -.124$, $n = 749$, $p = .001$; as well as with FSC 14-17, $r = -.140$, $n = 749$, $p < .001$; and with FSC > 17, $r = -.135$, $n = 749$, $p < .001$. The results of these correlations are depicted in Table A3.

Mediation Model 1: Forced Sexual Contact Prior to age 13

Baron and Kenny (1986) Analysis. A simple mediation analysis using ordinary least squares path analysis was performed. As can be seen in Figure A1 and Table A4 sexual contact prior to age 13 (FSC < 13) significantly predicted self-reported symptoms of PTSD ($c = 8.362$, $p < .001$). Research participants who endorsed sexual contact prior to age 13 reported lower levels of positive affect than those who denied sexual contact prior to age 13 ($a = -2.257$, $p = .001$), and subjects who endorsed lower levels of positive affect reported greater levels of symptoms related to PTSD ($b = -.455$, $p < .001$) after controlling for sexual contact prior to age 13 (FSC <13). Sexual contact prior to age 13 (FSC <13) predicted higher levels of self-reported PTSD after controlling for PA ($c' = 7.336$, $p < .001$). According to Baron and Kenny (1986) the resulting model demonstrates partial mediation.

Hayes (2013) Analysis. A bias-corrected bootstrap confidence interval for the indirect effect ($ab = 1.026$) based on 10,000 bootstrap samples demonstrated significance of the indirect effect, 95% CI [.418, 1.778]. As can be seen in Table A5 the indirect effect of positive affect accounts for 12.3% of the effect of sexual contact prior to age 13 on self-reported symptoms of PTSD (Hayes, 2013; MacKinnon, Krull, & Lockwood, 2000; MacKinnon, Warsi, & Dwyer, 1995). Furthermore, the observed indirect effect of positive affect is approximately 4.1% as large as its maximum possible value, given the inter correlations of the variables.

Mediation Model 2: Forced Sexual Contact Between Ages 14-17

Baron and Kenny (1986) Analysis. A simple mediation analysis using ordinary least squares path analysis was performed. As can be seen in Figure A2 and Table A6, forced sexual contact between ages 14 and 17 (FSC 14-17) significantly predicted self-reported symptoms of PTSD ($c = 9.533, p < .001$). Research participants who endorsed forced sexual contact between ages 14 and 17 reported lower levels of positive affect than those who denied forced sexual contact between ages 14 and 17 ($a = -3.111, p < .001$), and subjects who endorsed lower levels of positive affect reported greater levels of symptoms related to PTSD ($b = -.454, p < .001$) after controlling for forced sexual contact between ages 14 and 17 (FSC 14-17). Forced sexual contact between ages 14 and 17 predicted higher levels of self-reported PTSD after controlling for PA ($c' = 8.122, p < .001$). According to Baron and Kenny (1986) the resulting model demonstrates partial mediation.

Hayes (2013) Analysis. A bias-corrected bootstrap confidence interval for the indirect effect ($ab = 1.412$) based on 10,000 bootstrap samples demonstrated significance

of the indirect effect, 95% CI [.671, 2.344]. As can be seen in Table A7, the indirect effect of positive affect accounts for 14.8% of the effect of forced sexual contact between ages 14 and 17 on self-reported symptoms of PTSD (MPSS; Hayes, 2013; MacKinnon et al., 1995; MacKinnon et al., 2000). Furthermore, the observed indirect effect of positive affect is approximately 4.6% as large as its maximum possible value, given the inter correlations of the variables.

Mediation Model 3: Forced Sexual Contact After Age 17

Baron and Kenny (1986) Analysis. A simple mediation analysis using ordinary least squares path analysis was performed. As can be seen in Figure A3 and Table A8, forced sexual contact after age 17 (FSC < 17) significantly predicted self-reported symptoms of PTSD ($c = 10.904, p < .001$). Research participants who endorsed forced sexual contact after age 17 reported lower levels of positive affect than those who denied forced sexual contact between ages 14 and 17 ($a = -3.353, p < .001$), and subjects who endorsed lower levels of positive affect reported greater levels of symptoms related to PTSD ($b = -.454, p < .001$) after controlling for forced sexual contact after age 17 (FSC < 17). Forced sexual contact after age 17 predicted higher levels of self-reported PTSD after controlling for PA ($c' = 9.382, p < .001$). According to Baron and Kenny (1986) the resulting model demonstrates partial mediation.

Hayes (2013) Analysis. A bias-corrected bootstrap confidence interval for the indirect effect ($ab = 1.521$) based on 10,000 bootstrap samples demonstrated significance of the indirect effect, 95% CI [.741, 2.568]. As can be seen in Table A9, the indirect effect of positive affect accounts for 14.0% of the effect of forced sexual contact after age 17 (FSC < 17) on self-reported symptoms of PTSD (MPSS; Hayes, 2013; MacKinnon et

al., 1995; MacKinnon et al., 2000). Furthermore, the observed indirect effect of positive affect is approximately 4.4% as large as its maximum possible value, given the inter correlations of the variables.

Discussion

This study is the first of its kind to investigate mediation of positive affect in low-income, African American women survivors of sexual assault. Consistent with previous studies, endorsement of sexual assault was associated with self-reported symptoms of PTSD (Alim et al., 2006; Liebschutz et al., 2007). As hypothesized, endorsement of sexual assault experienced prior to age 13, between ages 14 and 17, and after the age of 17 were each respectively related to lower levels of positive affect, which subsequently correlated significantly with self-reported symptoms of PTSD. Specifically, women who endorsed experiencing sexual assault tended to endorse symptoms related to PTSD and this was attributable at least in part to lower levels of positive affect. The results suggest a causal chain, in that women who survive a sexual assault are vulnerable to decreased positive affect, which results in heightened self-reported symptoms of PTSD.

This study highlights the need to assess for low positive affect and work towards promoting positive affect in this population. Given the risks present with this clinical presentation, it is concerning that little attention has been paid thus far regarding the causal role of positive affect. Treatment rendered to sexual assault survivors should include multifaceted interventions as well as screeners to assess for the presence of low affect. However, these findings must be interpreted in the context of the study's limitations. First, the sample was comprised of volunteers recruited from a primary care clinic and an obstetrics/ gynecology clinic of an inner-city hospital, therefore, the results

of this study may not be generalizable to other African American women living in non-urban communities or coming from other social-economic backgrounds. Secondly, data was gathered through self-report measures and may have been affected by multiple biases, including socially desirable response patterns and retrospective bias. Third, the self-report measures may have been sensitive to situational factors, due to the cross-sectional nature of the research design. Fourth, although a mediation analysis is a causal effects model, in that the intermediary variable exists causally between the independent and dependent variable (Hayes, 2013), simple mediation is still primarily a correlational statistical method. Therefore, any results should be interpreted with caution. Fifth, given the nature of bootstrapping, the confidence intervals for each mediation model are not fixed. In order to attenuate the potential for this, a 10,000 bootstrap sample was utilized, shrinking the potential for variation in the estimation of the limits of the confidence interval. Sixth, no attempts were made to assess for trauma severity or multiple sexual traumas, each of which may have led to significantly different results. Lastly, given the small effect size of the present study, results should be interpreted with caution.

Implications for Future Research

Studies investigating the role of epiphenomenal variables in the relationship of positive affect with both sexual assault and the later development of self-reported symptoms of PTSD may prove beneficial in strengthening our understanding of the causal role of positive affect. Other suggestions for future research studies include replicating the current study with a male population and extending it to include other types of traumas. Furthermore, according to the literature, positive affect and negative affect are orthogonal constructs (Karlson & Archer, 2007) that occur concurrently (Bood,

Archer, & Norlander, 2004; Cropanzano, James, & Konovsky, 1993; Watson & Walker, 1996) and at varying degrees (Watson & Clark, 1984), which can lead to four different dispositional styles (Watson & Clark, 1984). Research is needed to identify how these variations in affective style may differentially contribute to the present models.

Researchers may also find it beneficial to include a measure of resiliency, in order to determine the possible contribution of positive affect in the observed resiliency in women survivors of sexual assault, beyond its facilitative role in the development of PTSD related symptoms post sexual assault.

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APPENDIX

APPENDIX A

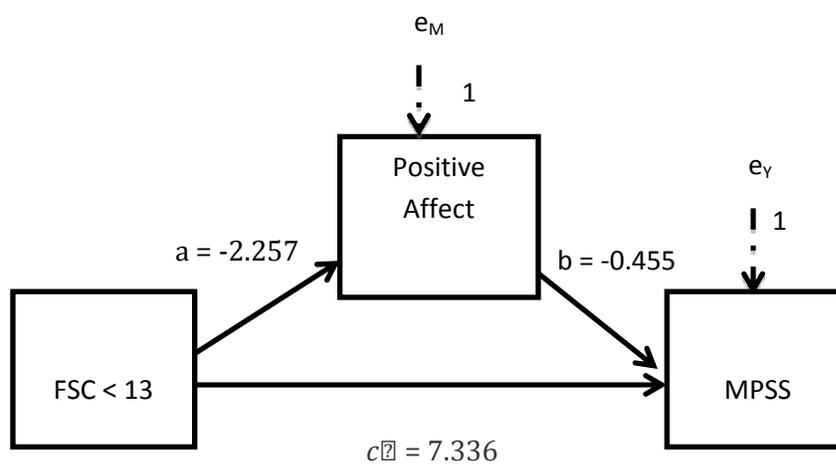


Figure A1

Simple mediation model for positive affect influence on sexual contact prior to age 13 on self-reported symptoms of PTSD in the form of a statistical diagram

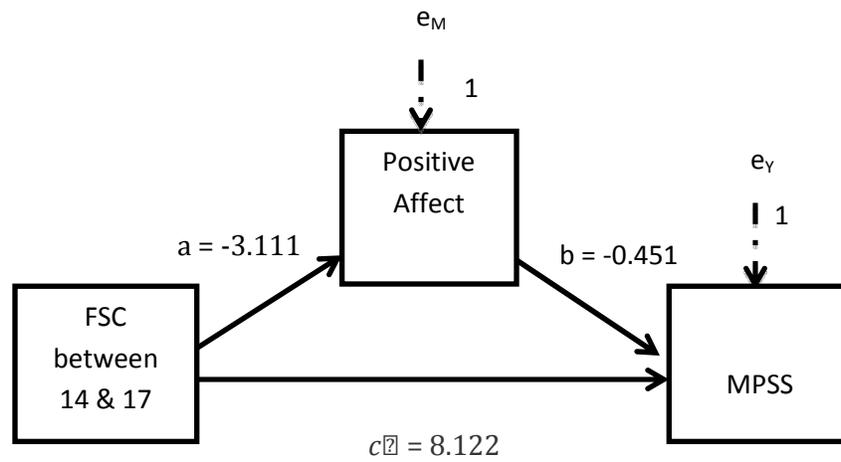


Figure A2

Simple mediation model for positive affect influence on sexual contact between ages 14 and 17 on self-reported symptoms of PTSD in the form of a statistical diagram

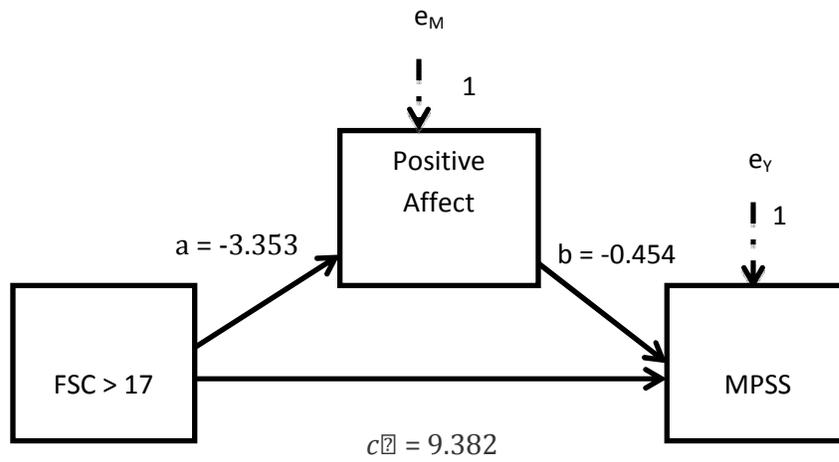


Figure A3

Simple mediation model for positive affect influence on forced sexual contact after age 17 on self-reported symptoms of PTSD in the form of a statistical diagram

Table A1

Psychometric Properties of the Major Study Measures (N = 749)

Measure	<i>M</i>	<i>SD</i>	α
^a Modified PTSD Symptom Scale (MPSS)	15.22	12.94	.91
^b Positive Affect Subscale of the Positive and Negative Affect Schedule (PANAS),	39.57	8.50	.89
^{c,d,e} Traumatic Events Inventory (TEI)	5.39	3.69	.75

Note. ^aModified Posttraumatic Stress Scale (MPSS; Falsetti, Resnick, Resick, &

Kilpatrick, 1993); ^bPositive and Negative Affect Schedule (PANAS; Merz et al., 2013);

^{c,d,e}Traumatic Events Inventory (TEI; Gaben et al., 2011; Schwartz et al., 2005, 2006)

Table A2

Descriptive Statistics for Dependent Variables and Predictor Variables

	N	MIN	MAX	M	SD	Skewness	Kurtosis
MPSS ^a	749	0	51	13.17	12.26	0.89	-0.09
Positive Affect ^b	749	10	50	39.56	8.50	-0.96	0.56
FSC before age 13 ^c	749	0	1	0.32	0.47	0.76	-1.43
FSC between ages 14-17 ^d	749	0	1	0.18	0.38	1.69	0.86
FSC after age 17 ^e	749	0	1	0.14	0.34	2.13	2.53

Note. ^aModified Posttraumatic Stress Scale (MPSS; Falsetti, Resnick, Resick, &

Kilpatrick, 1993); ^bPositive and Negative Affect Schedule (PANAS; Merz et al., 2013);

^{c,d,e}Traumatic Events Inventory (TEI; Gaben et al., 2011; Schwartz et al., 2005, 2006)

Table A3

Pearson Correlation Matrix among Self Report Measures (n = 749)

Subscale	1	2	3	4	5
1. ^a MPSS	-				
2. ^b Positive Affect	-.350**	-			
3. ^c FSC before age 13	.319**	-.124**	-		
4. ^d FSC between ages 14-17	.297**	-.140**	.180**	-	
5. ^e FSC after age 17	.305**	-.135**	.208**	.233**	-

**p < 0.000.

Note. ^aModified Posttraumatic Stress Scale (MPSS; Falsetti, Resnick, Resick, & Kilpatrick, 1993); ^bPositive and Negative Affect Schedule (PANAS; Merz et al., 2013); ^{c,d,e}Traumatic Events Inventory (TEI; Gaben et al., 2011; Schwartz et al., 2005, 2006)

Table A4

Model Coefficients for the Indirect Effects of Positive Affect on Sexual Contact Prior to Age 13 on Self-Reported Symptoms of PTSD

Antecedent	Consequent						
	M (Positive Affect)				Y (MPSS)		
	Coeff.	SE	p	Coeff.	SE	p	
X (FSC >13)	^a <i>a</i> -2.257	0.671	.001	^b <i>c'</i> 7.336	0.889	< .000	
M (PA)	-	-	-	^c <i>b</i> -0.455	0.056	< .000	
Constant	^d <i>i</i> ₁ 40.292	0.369	< .000	^e <i>i</i> ₂ 28.794	2.450	< .000	
	$R^2 = 0.015$			$R^2 = 0.200$			
	$F(1, 747) = 11.318, p = .001$			$F(2, 746) = 84.464, p < .000$			

Note. All standard errors for continuous outcome models are based on the HC3 estimator, which accounts for heteroscedasticity present in the data.

^aRefers to the estimated direct effect of forced sexual contact on positive affect.

^bRefers to the estimated direct effect of forced sexual contact on self-reported symptoms of Posttraumatic Stress Disorder.

^cRefers to the direct effect of positive affect on self-reported symptoms of Posttraumatic Stress Disorder.

^{d,e} Refer to the regression intercepts

Table A5

Effect Sizes for the Indirect Effects of Positive Affect on Sexual Contact Prior to Age 13 on Self-Reported Symptoms of PTSD

Effect Type	Effect	Boot SE	BootLLCI	BootULCL
Ratio of Indirect to Total Effects of X on Y	0.123	0.039	0.055	0.208
Kappa-Squared	0.041	0.013	0.017	0.070

Note. All standard errors for continuous outcome models are based on the HC3 estimator.

Table A6

Model Coefficients for the Indirect Effects of Positive Affect on Sexual Contact Between Ages 14 and 17 on Self-Reported Symptoms of PTSD

Antecedent	Consequent							
	M (Positive Affect)				Y (MPSS)			
	Coeff.	SE	p	Coeff.	SE	p		
X (FSC 14-17)	^a <i>a</i>	-3.111	0.819	<.000	^b <i>c'</i>	8.122	1.114	<.000
M (PA)	-	-	-	-	^c <i>b</i>	-0.454	0.057	<.000
Constant	^d <i>i</i> ₁	40.116	0.338	<.000	^e <i>i</i> ₂	29.684	2.463	<.000
	$R^2 = 0.020$				$R^2 = 0.185$			
	$F(1, 747) = 14.434, p < .000$				$F(2, 746) = 74.658, p < .000$			

Note. All standard errors for continuous outcome models are based on the HC3 estimator, which accounts for heteroscedasticity present in the data.

^aRefers to the estimated direct effect of forced sexual contact on positive affect.

^bRefers to the estimated direct effect of forced sexual contact on self-reported symptoms of Posttraumatic Stress Disorder

^cRefers to the direct effect of positive affect on self-reported symptoms of Posttraumatic Stress Disorder

^{d,e} Refer to the regression intercepts

Table A7

Effect Sizes for the Indirect Effects of Positive Affect on Sexual Contact Between Ages 14 and 17 on Self-Reported Symptoms of PTSD

Effect Type	Effect	Boot SE	BootLLCI	BootULCL
Ratio of Indirect to Total Effects of X on Y	0.148	0.042	0.075	0.242
Kappa-Squared	0.046	0.014	0.022	0.075

Note. All standard errors for continuous outcome models are based on the HC3 estimator.

Table A8

Model Coefficients for the Indirect Effects of Positive Affect on Sexual Contact After Age 17 on Self-Reported Symptoms of PTSD

Antecedent	Consequent							
	M (Positive Affect)			Y (MPSS)				
	Coeff.	SE	p	Coeff.	SE	P		
X (FSC > 17)	^a <i>a</i>	-3.353	0.930	<.000	^b <i>c'</i>	9.382	1.244	<.000
M (PA)	-	-	-	-	^c <i>b</i>	-0.454	0.058	<.000
Constant	^d <i>i</i> ₁	40.020	0.329	<.000	^e <i>i</i> ₂	29.842	2.512	<.000
		$R^2 = 0.018$				$R^2 = 0.190$		
		$F(1, 747) = 12.997, p < .000$				$F(2, 746) = 81.371, p < .000$		

Note. All standard errors for continuous outcome models are based on the HC3 estimator, which accounts for heteroscedasticity present in the data.

^aRefers to the estimated direct effect of forced sexual contact on positive affect.

^bRefers to the estimated direct effect of forced sexual contact on self-reported symptoms of Posttraumatic Stress Disorder.

^cRefers to the direct effect of positive affect on self-reported symptoms of Posttraumatic Stress Disorder.

^{d,e} Refer to the regression intercepts.

Table A9

Effect Sizes for the Indirect Effects of Positive Affect on Sexual Contact After Age 17 on Self-Reported Symptoms of PTSD

Effect Type	Effect	Boot SE	BootLLCI	BootULCL
Ratio of Indirect to Total Effects of X on Y	0.140	0.042	0.070	0.235
Kappa-Squared	0.044	0.013	0.021	0.073

Note. All standard errors for continuous outcome models are based on the HC3 estimator.