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A confirmatory factor analysis of specific phobia domains in African American and Caucasian American young adults

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Abstract

The current study investigated factors related to specific phobia domains and differences in patterns among African American and Caucasian American adults. Subjects were 100 African Americans and 121 Caucasian Americans who completed the Fear Survey Schedule—Second Edition (FSS-II). Fears related to specific phobia domains were first examined, with frequencies differing between African American and Caucasian American samples on three of the six specific phobia domains. A confirmatory factor analysis was conducted to determine the patterns of specific phobias among the African American sample. The trimmed model for the African American sample included natural environment, animal and social anxiety specific phobia factors as latent, exogenous variables. Data from the Caucasian American sample provided a poor fit to this model. Instead, the trimmed model for the Caucasian American sample included the situational, animal and social anxiety factors. The natural environment-type specific phobia factor did not have adequate fit for the Caucasian American sample as in the African American sample. Results indicated that different factor loading patterns of fear-related stimuli may exist among African American and Caucasian American young adults. Potential explanations and future directions are discussed.

Keywords: Phobias; African Americans; Anxiety disorders; Fear; Confirmatory factory analysis

1. Introduction

Anxiety disorders are among the most common mental disorders in the United States with an estimated 12-month prevalence rate of 18.1% (Kessler, Chiu, Demler, & Walters, 2005). Although the negative impact of anxiety disorders as a class has been clearly established (Greenburg et al., 1999), specific phobias have received limited attention in empirical literature. Presumably this is because they are often secondary diagnoses to more salient and debilitating anxiety disorders. Further, specific phobia stimuli may be easily avoided such that individuals do not present for treatment as often as for other anxiety disorders. The literature is particularly sparse with regard to specific phobias in ethnic minority samples. The current study addresses these issues by conducting a confirmatory factor analysis of specific phobia items in a sample of Caucasian American and African American young adults.

The 1-year prevalence for specific phobias in community samples has been estimated at 8.7%, the highest of all DSM-IV psychological disorders (Kessler, Chiu, et al., 2005) with lifetime prevalence rates estimated at 12.5% in the general population (Kessler,

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Beflund, Demler, Jin, & Walters, 2005). These estimates comprise predominantly Caucasian American samples with little information about the prevalence of specific phobias in ethnic minority samples. Although the DSM-IV (American Psychiatric Association, 1994) has delineated four distinct subtypes of phobias, there is evidence that the classification of phobias may be more complex (Fyer, 1998). Some researchers have found that the natural environment phobia category has clustered with situational phobias based on demographic characteristics (Fredrikson, Annas, Fischer, & Wik, 1996; Fyer, 1998) while others have found differences related to age of onset (Barlow & Liebowitz, 1995; Fyer, 1998). As such, few studies have examined phobia groupings in the general population and even fewer studies have examined racial differences in this area. Whether African Americans and Caucasian Americans have similar patterns related to specific phobia domains is yet to be determined.

1.1. Phobic disorders in African American adults

There is a limited amount of research pertaining to anxiety disorders in African American adults (Heurtin-Roberts, Snowden, & Miller, 1997; Horwath, Johnson, & Hornig, 1994; Lewis-Hall, 1994; Neal & Brown, 1994; Neal & Turner, 1991; Smith, Friedman, & Nevid, 1999). Existing literature indicates that African American adults may be more likely to endorse certain anxiety disorders than others (Heurtin-Roberts et al., 1997; Neal & Turner, 1991). For instance, African Americans have been found to endorse more agoraphobia-related fears than Caucasian Americans (Neal & Turner, 1991) and endorse specific phobia three times more than Caucasian American adults (Last & Perrin, 1993; Neal & Turner, 1991). African Americans also report more animal-related fears than their Caucasian American counterparts (Nalven, 1970), but more empirical work is needed to determine if certain fears load on similar factors regardless of race.

There are few data pertaining to African Americans and social phobia. Brown and Eaton (1986) found that the prevalence for social phobia was higher in African Americans (5.6%) than Caucasian Americans (2.6%) residing in Baltimore. The social fears endorsed by African Americans in the Brown and Eaton (1986) study surrounded interacting with groups and eating in public. Aside from these findings, Neal and Turner (1991) point out that treatment studies with social phobic individuals typically contain very few African Americans. A substantial amount of work is needed to determine the nature of social phobia in African American adults.

In summary, existing literature suggests that African Americans are more likely than Caucasian Americans to endorse specific phobias although further work is needed in this area to draw conclusions. Similarly, there is also heterogeneity among phobic disorders and the grouping of phobias is difficult to ascertain. Although there are four established subgroups of phobias in the DSM-IV (American Psychiatric Association, 1994), there still remains ambiguity about the factor loadings of phobias. Few studies have examined specific phobia domains and even fewer studies have examined whether fear-endorsed items have similar patterns (e.g., load on the same factors) in African American and Caucasian American adults. Thus, the current study tested a model to determine if phobias group together similarly for African American and Caucasian American young adults. It was hypothesized that African Americans would endorse more fears overall compared to Caucasian Americans, and that African Americans would also report more animal-related fears than Caucasian Americans. Based on the existing literature, it was further hypothesized that African Americans in the current sample would have more factor loadings in the animal domain than Caucasian Americans. Due to the dearth in the literature pertaining to factor loadings of specific phobia domains in ethnic minority samples, no additional specific hypotheses were made.

2. Methods

2.1. Participants

Participants were 221 undergraduate students from a large public Midwestern university. Students were recruited from two sources: an introductory psychology class ($N = 130$) and introductory level Pan African Study classes ($N = 91$). Participants were given class credit for participating in the study. The sample included 71 males and 150 females with a mean age of 20 years. Fifty-five percent of the sample was Caucasian American while the remaining 45% was African American. Participants completed the Fear Survey Schedule—Second Edition (FSS-II; Geer, 1965) in a group setting as a part of a larger study measuring ethnic differences in anxiety. Table 1 presents demographics for the sample.

2.2. Model indicators

Responses from the FSS-II served as model indicators in the confirmatory factor analyses. Latent

Table 1
Demographics

Variable	African American	Caucasian American	t/χ^2
Gender			.106
Male	31	40	
Female	69	81	
Age			−4.03***
M	21.7	19.14	
S.D.	5.81	3.52	
Living arrangements			3.352
On campus, alone	57	54	
Off campus, alone	43	62	
Family income			25.21***
<$29,999	26	17	
$30,000–59,999	44	27	
>$60,000	29	76	

*** $p < .001$.

factors were psychological constructs conceptually related to the model indicators (e.g., phobia domains).

2.2.1. The Fear Survey Schedule—Second Edition (Geer, 1965)

The FSS-II is a 51-item instrument recommended for specific phobia assessment in a research setting. Participants rate on a scale of 1–7 the amount of fear or distress associated with a number of stimuli and situations. The internal reliability of the FSS-II is high ($r = .94$; Geer, 1965). The validity of the FSS-II has been established with multiple factor analytic studies which indicate that the measure contains several major factors including water, death, illness and injury, concrete objects, live organisms, violence, social interaction, and negative social evaluation (Bernstein & Allen, 1969; Rubin, Katkin, & Weiss, 1968). The measure has also been correlated with a number of other anxiety measures (Geer, 1965) and scores have been shown to decrease after specific phobia treatment (Öst, 1989; Öst, Fellenius, & Sterner, 1991).

2.3. Procedure

To create specific phobia domains, the two principal investigators (LKC, JWB) categorized the items on the FSS-II based on the DSM-IV (American Psychiatric Association, 1994) diagnostic categories for specific phobias as well as a social phobia category based on item content. The raters had excellent agreement ($K = 1.00$) on the categorical assignment of items.

2.4. Approach to confirmatory factor analysis

The sample covariance matrix was estimated using a maximum-likelihood solution with an analysis of moment structure program (AMOS; Arbuckle, 2006). Global fit was measured by the chi-square goodness-of-fit test. The comparative fit index (CFI; Bentler, 1990), the incremental fit index (IFI; Bollen, 1989), and root mean square error of approximation (RMSEA) were further utilized as additional measures of global fit. Acceptable fit values for the global fit indices are close to 1.0 (Hoyle & Smith, 1991; Hu & Bentler, 1999) with acceptable RMSEA cutoff values being close to .06 (Hu & Bentler, 1999). Model invariance was examined across racial groups to determine whether similar patterns existed.

3. Results

3.1. Demographic comparisons

As illustrated in Table 1, the African American and Caucasian American participants significantly differed with respect to age and income. The two groups did not significantly differ on living arrangements and gender. Partial correlations were conducted with each specific phobia domain score along with participant age and income while controlling for ethnicity. The correlations are presented in Table 2. As shown in Table 2, age and income were not significantly correlated with the FSS-II

Table 2
Partial correlations of age and income for specific phobia categories from the FSS-II

Variables	1	2	3	4	5	6	7
1. Age	–	−.112	.035	.057	.072	−.059	−.074
2. Family income	–	–	.076	−.041	.001	−.075	−.005
3. BII cluster	–	–	–	.229	.294	.064	.211
4. Natural environment cluster	–	–	–	–	.677	.211	.529
5. Situational cluster	–	–	–	–	–	.436	.639
6. Social cluster	–	–	–	–	–	–	.513
7. Other cluster	–	–	–	–	–	–	–

specific phobia domains after controlling for ethnicity; accordingly age and income were not included in subsequent analyses.

3.2. Frequency of specific phobia domains among African American and Caucasian American samples

To determine whether African American and Caucasian American participants were similar in their endorsement of items within the specific phobia domains, *t*-tests were conducted between the two groups on each of the six specific phobia domains. The results are presented in Table 3. As illustrated in Table 3, African American participants endorsed significantly greater animal fears than the Caucasian American participants, while the Caucasian American participants endorsed significantly greater social and blood-injection-injury (BII) fears than the African American participants.

3.3. Specific phobia domains for African American sample

We first conducted a confirmatory factor analysis in the African American sample. Amos Version 7.0 structural modeling software (Arbuckle, 2006) was used to assess the parameters of the model. A confirmatory factory analysis was conducted based on the items from the FSS-II. The original model yielded a non-admissible solution due to the number of parameters contained in the model. The model was trimmed until an admissible solution with adequate fit was achieved for the African American sample. For all endogenous variables, regression weights were set to 1 for all error terms, and the exogenous variables were allowed to be correlated with one another. The final model is illustrated in Fig. 1. The global fit indices for the model indicated excellent fit with the observed data χ^2 (51, $N = 100$) = 60.8, $p = .163$; TLI = .957, CFI = .967, IFI = .968, RMSEA = .044. The trimmed model for the African American sample included natural environment, animal and social anxiety factors as latent, exogenous variables. Neither the blood-injection-injury nor the situational factors loaded in the African American sample.

Table 3
Frequency differences of specific phobia categories among African American and Caucasians Americans

Variable	Blacks	Whites	*t*
Animal			
M	12.99	9.512	−3.701***
S.D.	8.03	5.919	
Blood-injection-injury			
M	2.38	3.2	1.993*
S.D.	2.64	3.33	
Natural environment			
M	5.78	5.16	−1.341
S.D.	3.66	3.24	
Situational			
M	13.31	14.61	.265
S.D.	8.30	8.96	
Social anxiety			
M	18.66	22.53	2.627**
S.D.	10.42	11.27	
Other			
M	32.78	34.33	.757
S.D.	14.98	15.30	

* $p < .05$.
** $p < .01$.
*** $p < .001$.

3.4. Specific phobia domains for Caucasian American sample

Data from the Caucasian American sample were tested on the model obtained from the African American sample to determine whether a similar patter existed in both groups. As indicated in Fig. 2, the chi-square test was significant $\chi^2(51, N = 121) = 101$, $p < .01$ indicating significant departure from the observed data.

3.5. Trimmed model for the Caucasian American sample

Because the data from the Caucasian American sample did not provide a good fit of the model obtained for the African American sample an additional model was then posed for the Caucasian American sample, similar to the procedure delineated for the African American sample. Again, the original model yielded a non-admissible solution due to the number of parameters and the model was trimmed until an admissible solution with adequate fit was achieved. The results are illustrated in Fig. 3. The global fit indices for the model indicated excellent fit with the observed data $\chi^2(11, N = 121) = 16.9$, $p = .112$; TLI = .972, CFI = .985, IFI = .986, RMSEA = .049. As shown in Fig. 3, the factors for the Caucasian American sample included the situational, animal, and social anxiety domains. Furthermore, neither the blood-injection-injury nor the natural environment factors loaded in the Caucasian American sample. These results indicate that different

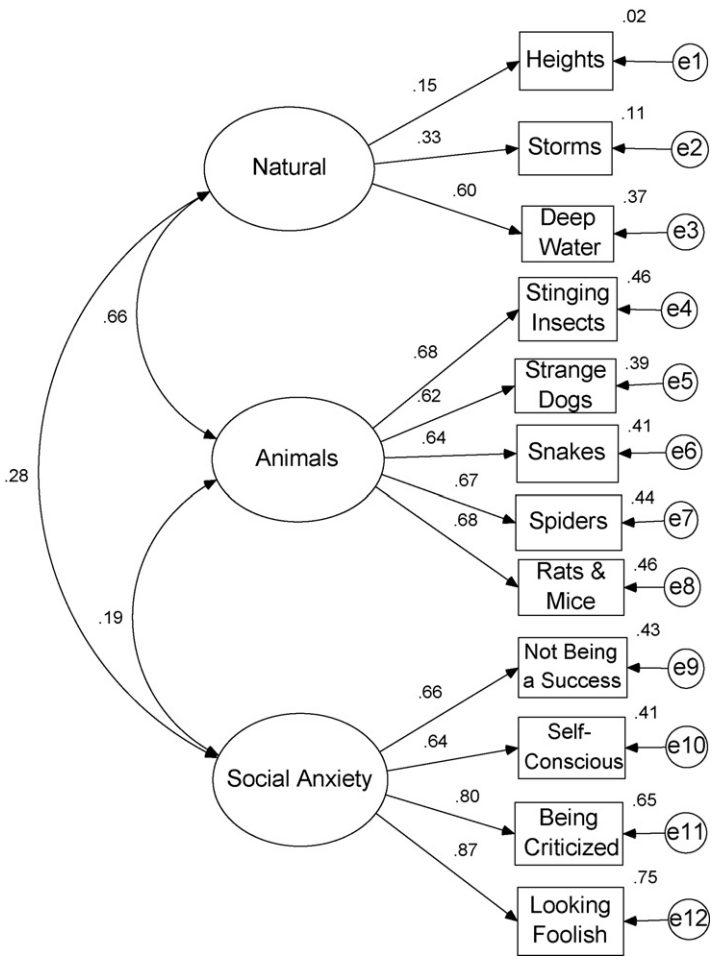

Fig. 1. Specific phobia categories for African American sample. *Note.* Arrows and corresponding numbers denote regression weights; number above endogenous variables depicts variance accounted for by exogenous variable.

factor patterns exist among the African American and Caucasian American adults in the current sample as they relate to the fears assessed by the FSS-II.

4. Discussion

To date, the current investigation is one of the first to compare specific phobia domains through confirmatory factor analysis in African American and Caucasian American adults based on item responses from the FSS-II. The results indicated that significant differences exist between African American and Caucasian American adults. Further, it appears that the fears endorsed by African American and Caucasian American adults result in different patterns, although some similarities exist within certain factors. For instance, the African American sample-endorsed fears related to the natural environment, animals, and social anxiety. The Caucasian American sample-endorsed fears related to circumscribed situations, animals, and social anxiety. Although the two samples were similar in two factors of specific phobia domains (i.e., animals and social anxiety), there were significantly different patterns in the items endorsed by the two samples. Overall, these results suggest that African Americans in the current sample endorsed a greater number of fears than the Caucasian American sample and that some disparities exist in the patterns of phobia domains among these two racial groups.

There are several differences in the specific phobia domains between the two samples worth noting. With regard to animal-related fears and African Americans, the findings from the current study corroborate previous literature. Although both samples yielded a specific phobia factor related to animals, only the African Americans in the current sample-endorsed fears related to stinging insects, strange dogs, as well as rats and mice. Both samples endorsed fears of spiders and

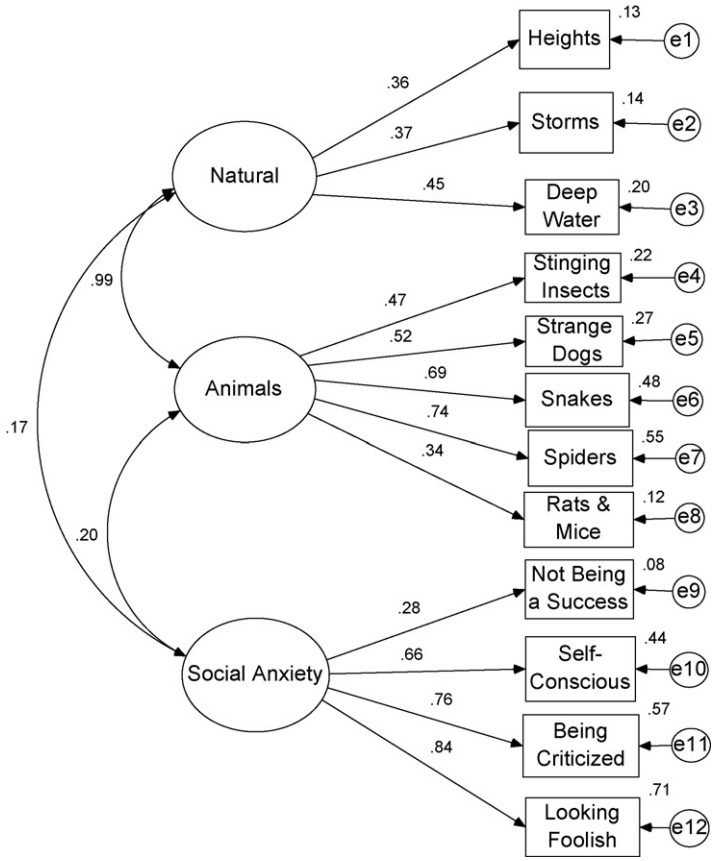

Fig. 2. African American specific phobia categories applied to Caucasian American sample. *Note.* Arrows and corresponding numbers denote regression weights; number above endogenous variables depicts variance accounted for by exogenous variable.

snakes. These results are consistent with the results obtained by Neal and Turner (1991) as well as Nalven (1970) indicating that African American adults endorse significantly more specific phobias than their Caucasian American counterparts and is further consistent with results obtained by Last and Perrin (1993). LaPouse and Monk (1959) yielded similar results in a sample of African American and Caucasian American children. Although there is speculation about the endorsement of animal fears in African American individuals, there is little empirical evidence in the literature to support this notion. For example, Neal and Turner (1991) posited that societal factors, such as hostility directed toward African Americans during times of overt racism, could have potentially accounted for the findings in the LaPouse and Monk (1959) study. Although this view likely accounts for previous findings in the literature, it remains unclear whether subsequent findings support this notion. Along these lines, a generational explanation could be posited in which African American adults from this time period may have communicated fear-eliciting information to subsequent generations of African American family members. This hypothesis is consistent with the findings that the etiology of many phobias may be the result of vicarious experience and/or misinformation in the context of a genetic predisposition (Barlow, 2002). More data are needed to clearly delineate the direct pathways by which animal phobias are acquired in African American samples.

The findings from the current study further suggest that African Americans may endorse more natural environment fears compared to Caucasian Americans, who endorsed more situational fears. Specifically, African Americans in the current sample reported more fear of heights, thunderstorms, and deep water. The Caucasian Americans in the current sample reported more fears of dark places and automobile accidents. Although the established models were necessary for adequate model fit, it should be noted that these specific differences were not significant and did not account for a substantial amount of the variance in the factors. One exception in the African American sample is that the natural environment factor accounted for 37% of the variance of the fear endorsement of deep

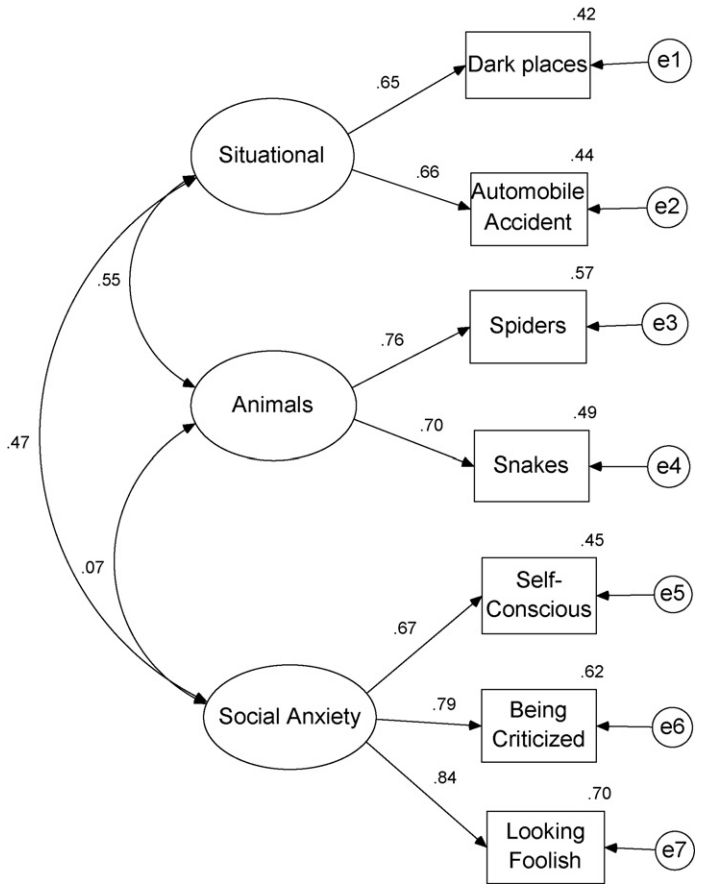

Fig. 3. Specific phobia categories for Caucasian American sample. *Note.* Arrows and corresponding numbers denote regression weights; number above endogenous variables depicts variance accounted for by exogenous variable.

water. One would presume that this relationship would have been significant with the omission of heights and thunderstorms as indicators. As such, further exploration of water-related fears needs to be examined in African American samples. In the Caucasian American sample, the fear of dark places was statistically significant. It is unclear why fears in the natural environment factor were significant for the African Americans while fears in the situational factor were significant for Caucasian Americans in the current sample. Future studies are needed to determine the significance of these findings.

Additionally, both groups in the current sample yielded factors that encompassed a social anxiety construct. Although the groups differed on overall content of the social anxiety factor, the fear of looking foolish to others was significant for both groups. This finding is not surprising given that the participants in the current study were undergraduate students at a major university and that peer evaluation seems to be important for most young adults, regardless of race. The significant difference between the African Americans and Caucasian Americans in the current sample involved the African American participants' greater endorsement of a fear of not being a success. There are a number of possible interpretations of this finding. First, the importance of kin support networks in the identity of African Americans has been well established in the literature (Boyd-Franklin, 2003; Caldwell & Koski, 1997; Hatchet & Jackson, 1992; McCabe, Clark, & Barnett, 1999; Murry, Bynum, Brody, Willert, & Stephens, 2001). As such, many African American young adults may view successful completion of their college degree not only as a reflection on the individual, but also a reflection of extended support networks, family, and other African Americans. Future work in this area is needed to determine whether having a stable kin support network serves a protective mechanism for the development of social anxiety in African Americans. Second, African American college students may feel more pressure to be successful in general than Caucasian American college students due to fear of

stereotypes as well as the disproportionate number of African Americans without a college education. Third, many of the students from the sampled university are first generation college students and, therefore, many of the African American students at the university fit this description. Being African American and a first generation college student likely provides added pressure to succeed in an academic setting. Finally, worth noting is the notion that marriage rates have steadily declined among African Americans (Boyd-Franklin, 2003; Tucker & Mitchell-Kernan, 1995). Along these lines, many African American students may come from single parent homes where academic success may have added meaning not only to the individual, but also for the individual's immediate family. More work is needed in this area to determine to draw this conclusion.

Although the current study contained many strengths related to the investigation of specific phobia domains across racial groups, there are several limitations worth noting. First, the current study relied solely on self-report questionnaire data, for which a social desirability factor often arises. Future research can expand on the initial findings of the current study by utilizing multiple assessments of specific phobia domains such as structured interviews, multiple questionnaires assessing similar constructs, and observation of participants during exposure to fear-endorsed stimuli. Second, the scope of the current investigation could have been enhanced by obtaining other information pertaining to psychological characteristics of the participants, such as temperament, diagnostic history, and negative affectivity. Third, the current findings warrant cross validation in the future to determine if the current results generalize to other samples.

The findings from the current study provide promising avenues for future research with African Americans and phobias. Identifying potential differences in the patterns of specific fears endorsed in African Americans is a preliminary step in investigating other differences in anxiety disorders that may exist across racial groups. Further research in this area may consider socioeconomic resources (i.e., marital status, income, living arrangements, etc.) as an additional factor contributing to racial differences as well as the examination of other specific phobias that may differ as a result of race.

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