Contents:

The effects of race and racial priming on self-report of contamination anxiety

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Abstract

African Americans show unusually high endorsement rates on self-report measures of contamination anxiety. The purpose of this study was to replicate this finding in a nationally representative sample and conduct a randomized experiment to determine the effect of salience of race as a causal factor. Black and White participants were given contamination items from two popular measures of obsessive-compulsive disorder, half prior to being primed about ethnic identity and half after being primed, via the administration of an ethnic identity measure. The experiment took the form of a 2 (Black and White participant) × 2 (ethnicity salient and ethnicity non-salient) double-blind design, with ethnic saliency assigned at random by computer. Participants consisted of a geographically representative US sample of African Americans supplemented with a similar sample of European Americans ($N = 258$). Black participants scored significantly higher than White participants on contamination scales. Participants from Southern states scored higher than those from other regions. Over-endorsements by Black participants were greater when awareness of ethnic and racial identification was increased. Clinical and research implications were discussed; these measures should be used with caution in African Americans.
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Keywords: Racial differences; Priming; African Americans; Anxiety disorders; Assessment; Obsessive-compulsive disorder; Stereotypes

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1. Introduction

1.1. Background

Previous research has demonstrated that African Americans show unusually high endorsement rates on some standard anxiety assessment instruments, specifically on screening tools for obsessive-compulsive disorder (Thomas, Turkheimer, & Oltmanns, 2000; Williams, Turkheimer, Schmidt, & Oltmanns, 2005). Work to date suggests that extraneous factors involving cultural attitudes about grooming and housekeeping are contributing to differences in responses rather than actual differences in psychopathology (Williams & Turkheimer, 2007). Obsessive-compulsive disorder (OCD) involves excessive washing due to contamination fears, repeated checking, impaired control over mental activities, worries about losing control over one's behaviors, and/or excessive hoarding of possessions (American Psychiatric Association, 2000). Focusing on contamination scales of two popular measures, this paper investigates Black–White differences on a representative national sample, examining regional differences and the hypothesis that salience of race contributes to over-endorsement among African Americans.

1.2. Ethnic bias in screening tools

Anxiety disorders are often identified by mental health professionals and researchers through the use of screening tools, such as questionnaires or checklists. For US ethnic minority groups, such as African Americans, assessment techniques for OCD have not been the subject of much scientific inquiry. Recent studies suggest that current self-report instruments are inadequate for this population.

Several different types of bias have been identified in relation to these instruments. A biased test is one in which there are systematic differences in the meaning of test scores based on group membership. Another way of saying this is that using a test to predict some criterion of interest results in systematic over-prediction or under-prediction based on group membership. It should be noted, however, that there are several ways an instrument can be described as biased, and not all psychometricians use the term in the same manner.

The Maudsley Obsessional Compulsive Inventory (Hodgson & Rachman, 1977) was found to lack predictive validity for African Americans when administered to college students, in part because of greater endorsement of cleaning and checking items (Thomas et al., 2000). Structured interviews revealed that high-scoring Black students were not more likely to have OCD than low scorers (i.e. no distress nor dysfunction), whereas the test did predict OCD psychopathology in White students. In this case, the test was systematically over-predicting OCD in African Americans with respect to an external measure (i.e. the structured interview), one indication of test bias.

The National Anxiety Disorders Screening Day (NADSD) instrument was administered to a large sample of patients from five ethnic groups (Ritsher, Stuening, Hellman, & Guardino, 2002). A six-factor model fit the data well for European Americans, but not fit for other ethnic groups. Within the OCD scale, the question about compulsions loaded on a different factor for Black participants, which is an example of bias arising from a different multivariate structure of OCD in the African American group.

Previous work by our group (Williams et al., 2005) replicated the findings of Thomas et al. (2000) using a more comprehensive measure, the 60-item Padua Inventory for obsessive-compulsive

disorder (Sanavio, 1988). The largest Black–White differences were seen on its 10-item contamination scale. African Americans scored higher than European Americans on every item of this scale, and, in fact, four contamination items were endorsed more strongly by Black participants than persons reporting a diagnosis of OCD (Williams et al., 2005). Analyses based on item response theory showed that Blacks and White participants differed in the relationship between observed responses to test items and the latent constructs measured by the scale, a form of bias known as differential item functioning, or DIF. There was significant DIF between Black and White participants on 11.6% of Padua items after adjusting for overall mean group differences, with biased items appearing in each of the scales. The item exhibiting the greatest DIF in favor of Blacks concerned animals, with Black participants more likely to report the need to immediately wash or change clothing after touching an animal. This response could be motivated by different cultural ideas about hygiene and animals, evidenced by the fact that ethnic minorities are less likely to own pets than Whites (Siegel, 1995). However, outside its cultural context, this could wrongly be interpreted as a symptom of anxiety-related distress.

In a recent psychometric investigation, we were able to identify bias in terms of differential discriminant validity with regards to a related non-pathological construct. Differences in normal attitudes about cleanliness influenced responses to items intended to assess anxiety pathology (Williams & Turkheimer, 2007). We administered anxiety screening instruments supplemented with cleanliness attitude items to both Black and White participants ($N = 1483$). Factor analysis suggested a three-factor solution: one factor that encompassed pathological anxiety, and two expressing normal attitudes about cleanliness, grooming, and domestic animals. African Americans scored significantly higher on all three scales, i.e., they expressed more anxiety about contamination, stronger concerns about personal cleanliness and housekeeping, and more negative attitudes about contact with animals. Further analysis demonstrated the difference between Black and White participants on the pathological anxiety factor was eliminated when differences on the attitude factors were controlled statistically.

1.3. Causes of bias

It is not known why African Americans express greater concern about washing and cleaning relative to European Americans (Williams et al., 2005). It would be incorrect to assume that differences are caused by an abstraction called "race"; ultimately, they must be caused by some psychologically potent variables associated with race. Race and ethnicity can be problematic variables in research, as the terms may have different meanings in different situations (Helms, Jernigan, & Mascher, 2005). Although we use "race" in this study to distinguish between "Black" and "White" participants, it should be noted that these groups could just as easily be described in terms of ethnic group or ethnic identity.

There may be actual differences in behaviors and increased concern with cleanliness may be a cultural norm for African Americans. Alternatively, other factors such as awareness of one's race or social stigma may be resulting in a reporting bias. The salience of group membership has been demonstrated to affect many attitudes and behaviors. Relevance of African American affiliation and/or stigma may be a cause of inflated scores on contamination measures.

When a construct is primed, people often act in construct-consistent ways. In a classic study by Bargh, Chen, and Burrows (1996) participants for whom an elderly stereotype was primed walked

more slowly down the hallway when leaving the experiment than did control participants, consistent with the stereotype of elderly people being slow and frail. In the same study, participants for whom the African American stereotype was subliminally primed reacted with more hostility to an annoying request made by the experimenter, presumably due to negative stereotypes about African American hostility. This priming behavior was described in terms of negative self-fulfilling prophecies, but priming may activate positive, negative, and neutral attitudes or behaviors.

Another example of the priming effect involves the construct of stereotype threat, a process whereby stigmatized groups under perform in the face of negative stereotypes about ability (Steele, 1997). Stereotype threat can be activated by the presence of a racial prime as innocuous as listing ones race on a form (Shih, Pittinsky, & Ambady, 1999).

1.4. Goals of study

The first goal of this study was to replicate Black–White differences in response to clinical measures of contamination anxiety in a national sample. To this end, we compared the responses of a geographically representative national sample of Black and White participants on the 10-item contamination scale of the Padua Inventory (Sanavio, 1988), which includes the 3-item washing scale of the Obsessive-Compulsive Inventory, short version (OCI-R: Foa et al., 2002). A benefit of a national sample is that it will demonstrate if differences are a local occurrence or larger phenomenon. If the differences are stronger in certain areas, it would provide a basis for generating additional hypotheses about causes, as cultural attitudes, behaviors, and/or stereotypes may vary in different geographical regions.

To the extent significant racial differences are observed, the second goal was to use a randomized experimental manipulation to determine if salience of racial or ethnic identity is a cause of racial differences. Based on prior work, we expected that Black participants would over-endorse items about washing and cleanliness. We further hypothesized that differences would be exaggerated when ethnic identity questions, intended to make race more salient, were presented first. The experiment takes the form of a 2 (Black and White participant) × 2 (ethnicity salient and ethnicity non-salient) double-blind design, with ethnic saliency assigned at random. The primary dependent variables are scores on the Padua contamination scale and OCI-R washing scale.

2. Methods

2.1. Participants

Data were collected via a project called Time-sharing Experiments for the Social Sciences (TESS). TESS is an NSF-funded infrastructure that offers investigators a large, diverse, randomly-selected population as a means of testing experimental ideas. TESS collects data for research projects by providing access to large-scale data collection instruments, one of these via the Internet, administered by Knowledge Networks. After a description of the study is provided to participants, written informed consent is obtained. Participants are provided with free Internet access (via WebTV) and are given the necessary hardware for as long as they remain in the sample. This facilitates the participation of subjects from varied socioeconomic backgrounds.

The sample consisted initially of 298 non-Hispanic Black and White participants who had lived in the US for at least ten years. Within the protocol, participants were asked to, "Check the number that gives the best answer to each question". Options included, "Black or African–American", "White, Caucasian or European (not Hispanic)", and "Mixed; parents are from two different groups (specify)". Participants reporting parents of two different racial/ethnic groups posed a potential confound to the study and were removed from the sample, as were participants reporting a history of OCD (40 subjects). This resulted in a final sample of 208 Black and 50 White participants. Participants ranged from 18 to 35 years, with a mean age of 28.6 (SD 5.1). The study had a response rate of 64%.

Respondents comprised a geographically representative US sample. Geographic region and household income for our sample approximated that of the US for this age group. Educational attainment, homeownership, and employment status indicates that our African American sample is of a slightly higher socioeconomic status (SES) than average. Our African American sample also had more females than the national average (67.7% female, 32.2% male).

2.2. Measures

Demographic information, including race and ethnic identification, was collected from all participants prior to the study. The last two questions of the battery concerned mental health history and asked participants if they had ever been diagnosed with OCD.

To prime subjects about their race and quantify allegiance to their ethnic group, we administered Phinney's Multigroup Ethnic Identity Measure (MEIM: Phinney, 1992). The MEIM, which is suitable for use with any ethnic group, contains items about degree of ethnic identification and race. The 14-item ethnic identity subscale was utilized, along with one fill-in question about the subjects' race and a multiple choice item about race. Items are scored from 0 (strongly disagree) to 3 (strongly agree). The position of the MEIM in the protocol was counter-balanced, appearing either at the beginning of the survey or at the end, but before items about mental health history. The MEIM includes questions such as "I have spent time trying to find out more about my own ethnic group, such as its history, traditions, and customs", and "I have a lot of pride in my ethnic group and its accomplishments".

The ten contamination items from the Padua Inventory (Sanavio, 1988) were used in this study. Items are scored from 0 (no distress) to 4 (very much distress). The presentation of items within the Padua was randomized to minimize ordering effects. The OCI-R is a self-report inventory for determining the diagnosis and overall severity of OCD and subclinical obsessional thoughts and behaviors in seven symptom areas (Foa et al., 2002). The 3-item washing scale is used for this study. Table 1 lists the items.

2.3. Procedures

Participants completed the measures via the Internet in the randomized order described above. Half the subjects were randomly chosen to receive MEIM ethnic identity questions before contamination items, and half the subjects were given ethnic identity questions after contamination items. We refer to experimental conditions as "ethnicity salient" and "ethnicity non-salient". Participants in the salient condition answered the MEIM before the OCD scales, and participants in

Table 1
Contamination items and scales

Variable	Item
P01	I feel my hands are dirty when I touch money
P02	I think even slight contact with bodily secretions…may contaminate my clothes or somehow harm me
P03	I find it difficult to touch an object when I know it has been touched by strangers or by certain people
P04	I find it difficult to touch garbage or dirty things
P05	I avoid using public toilets because I am afraid of disease and contamination
P06	I avoid using public telephones because I am afraid of contagion and disease
P07	I wash my hands more often and longer than necessary
P08	I sometimes have to wash or clean myself simply because I think I may be dirty or "contaminated"
P09	If I touch something I think is "contaminated", I immediately have to wash or clean myself
P10	If an animal touches me, I feel dirty and immediately have to wash myself or change my clothing
PI$_{CONT}$	All 10 Padua Inventory washing and contamination items.
OCI-R$_{WASH}$	OCI-R washing scale (P03, P07 & P08)

the non-salient condition received the MEIM after the OCD scales. The measures took approximately 14 min to complete. The scales utilized in this study were not administered to participants with a larger battery of psychological measures, as such a practice might have compromised the experiment.

3. Results

3.1. Black–White comparisons

The unidimensionality of the Padua contamination scale was verified in data from the national sample by exploratory factor analysis, which confirmed a one-factor solution. The first eigenvalue was equal to 4.25, and the second was equal 0.24. Examination of the scree plot showed that eigenvalues declined linearly with more factors.

T-tests were used for Black–White descriptive comparisons between participants on the ten individual items and two contamination scales. Black participants scored significantly higher on 90% of the items and both scales, with medium to large effect sizes (d). These findings are detailed in Table 2. Furthermore, Black–White differences on the contamination and washing scales remained highly significant even after controlling for gender, race, age, experimental condition, and potential interactions.

3.2. Regional differences

Means were determined for Black and White participants on the Padua contamination scale and OCI-R washing scale based on geographic region, shown in Table 3. Participants from Southern states reported higher levels of contamination concern than those from Midwest, Northeast, or Western regions. Participants were dichotomized into Southern and non-Southern groupings. Southern status was a predictor of PI contamination scores and OCI-R washing scores for Black and White participants, with a larger effect noted for White participants.

Table 2
Mean values for contamination items and scales

Variable	Race	Mean	Standard deviation	DF	t	Pr > |t|	d
P01	White	0.90	1.07	256	2.79	0.006	0.462
	Black	1.45	1.30				
P02	White	0.84	0.82	256	2.77	0.006	0.487
	Black	1.34	1.20				
P03	White	0.56	0.91	255	3.49	0.001	0.592
	Black	1.18	1.17				
P04	White	1.06	1.10	256	2.49	0.013	0.406
	Black	1.54	1.26				
P05	White	1.24	1.15	255	3.11	0.002	0.508
	Black	1.85	1.25				
P06	White	0.72	0.86	256	2.83	0.005	0.494
	Black	1.25	1.25				
P07	White	1.00	1.25	256	1.71	0.089	0.272
	Black	1.35	1.32				
P08	White	0.72	0.90	254	2.42	0.016	0.417
	Black	1.16	1.19				
P09	White	1.54	1.31	256	3.82	0.000	0.606
	Black	2.34	1.33				
P10	White	0.48	0.84	255	3.94	0.000	0.687
	Black	1.20	1.22				
PI_{CONT}	White	9.06	7.00	256	4.39	<0.0001	0.727
	Black	14.65	8.33				
$OCI\text{-}R_{WASH}$	White	2.28	2.56	256	3.19	0.002	0.518
	Black	3.69	2.87				

Table 3
Scale scores by geographic region and race

Variable	Race	US region	N	Mean	Standard deviation	t	Pr > |t|	d
PI_{CONT}	White	South	18	13.22	8.56	3.50	0.001	0.944
		Midwest-NE-West	32	6.72	4.64			
	Black	South	118	15.62	7.90	1.93	0.055	0.268
		Midwest-NE-West	90	13.39	8.74			
$OCI\text{-}R_{WASH}$	White	South	18	3.33	3.16	2.27	0.028	0.623
		Midwest-NE-West	32	1.69	1.97			
	Black	South	118	3.97	2.86	1.63	0.105	0.228
		Midwest-NE-West	90	3.32	2.85			

3.3. Experimental manipulations

Means were computed for Black and White participants on the Padua contamination scale and the OCI-R washing scale based on experimental condition. Means and standard deviations for each group and condition are shown in Table 4. The effect of experimental condition (race salient vs. race non-salient) was first tested using a *t*-test of differences between experimental groups

Table 4
Scale scores by race and salience of ethnicity

Variable	Race	Condition	N	Mean	Standard deviation	t	$Pr > |t|$	d
PI$_{\text{CONT}}$	White	Ethnicity salient (MEIM first)	24	9.04	7.06	−0.02	0.986	−0.006
		Ethnicity non-salient (MEIM last)	26	9.08	7.08			
	Black	Ethnicity salient (MEIM first)	95	15.95	8.85	2.07	0.040	0.286
		Ethnicity non-salient (MEIM last)	113	13.57	7.73			
OCI-R$_{\text{WASH}}$	White	Ethnicity salient (MEIM first)	24	2.25	2.57	−0.08	0.938	−0.023
		Ethnicity non-salient (MEIM last)	26	2.31	2.60			
	Black	Ethnicity salient (MEIM first)	95	4.21	3.15	2.41	0.017	0.332
		Ethnicity non-salient (MEIM last)	113	3.26	2.55			

within races. For Black participants, the difference between experimental conditions was significant, with the race salient group reporting higher scores on the PI contamination and the OCI-R washing scales. As hypothesized, in White participants, there was no significant difference between experimental conditions.

Women are at greater risk for mood and anxiety disorders (Kessler et al., 2005), and our African American sample had more females than males. Furthermore, women with OCD symptoms are more likely to endorse contamination concerns than men (Labad et al., 2007). To account for these potential confounds, we performed an ANOVA, predicting the Padua contamination scale score from salience of race, gender, and the interaction of salience of race and gender. Gender ($f(1, 207) = 4.47$, $p = .036$) and salience of race ($f(1, 207) = 3.94$, $p = .048$) were significant predictors, but the interaction was not ($f(1, 207) = 0.03$, $p = .86$). Applying the same model to the OCI-R washing scale, salience of race was significant ($f(1, 207) = 4.00$, $p = .047$) but neither gender ($f(1, 207) = 0.65$, $p = .421$) nor the interaction ($f(1, 207) = 0.70$, $p = .405$) was significant. Therefore we can safely conclude the effects of the experimental condition remain significant even after controlling for gender and age differences in the African American sample.

4. Discussion

4.1. Interpretation of findings

Black participants scored higher than White participants on every item and scale in this study. The consistent difference between groups demonstrates that the racial difference on these measures is a larger cultural pattern in the US population rather than solely a regional phenomenon. As described previously, evidence from related studies suggests this not an indication of increased pathological anxiety among African Americans but due to other factors, such as measurement bias. When Thomas et al., 2000 performed clinical interviews with high-scoring Black students on a similar instrument, the students did not meet criteria for OCD. Our most recent studies found a significant relationship between normal attitudes about grooming and housekeeping and endorsement of contamination items, with African Americans reporting significantly higher levels of both (Williams & Turkheimer, 2007). The result of our experimental manipulation

demonstrates that salience of race is one factor in the over-endorsement of washing and contamination items by African Americans.

4.2. The role of race

One possibility is that African Americans are over-endorsing cleaning items to counteract negative stereotypes, resulting in a reporting bias in favor of exaggerated cleaning attitudes. For example, a behavioral treatment study by Hatch, Friedman, and Paradis (1996) documented greater reluctance among Black clients to disclose OCD symptoms out of fear of being labeled "crazy", illustrating that self-presentation may be a factor in reporting certain pathological traits (Whaley, 2001).

If these compensations were unconscious, then the phenomenon would bear some similarity to Steele's (1997) construct of stereotype threat, but to date stereotype threat has been documented only in reference to academic, intellectual, and athletic performance. As it is traditionally understood, stereotype threat results in impaired performance due to mental interference. The phenomenon described in this study may instead be the result of an unconscious desire to present oneself and ones group in a counter-stereotypical manner. The term "stereotype compensation" may better describe this phenomenon.

Unconscious anxiety due to racial stereotypes cannot account for most of the Black–White differences found on the measures under study. It is likely that differing cultural practices, attitudes about housekeeping, and perhaps a culturally-embedded compensation due to generations of negative stereotyping all play a role. Historically, segregation statutes prevented Black and White Americans from utilizing the same facilities under the assumption that European Americans would be contaminated by shared usage. Historical restrictions and negative stereotypes may have resulted in a cultural reaction whereby attitudes about the importance of cleanliness have been exaggerated to compensate. This accounts for the greater concerns about cleanliness found in people living in the Southern US, the geographical region most affected by historical segregation.

If increased cleaning behaviors are a cultural norm, being primed about ethnic identity could activate relevant thoughts and trigger related actions (Bargh et al., 1996). Increasing the salience of ethnic identity may serve as a reminder of expected group behaviors, in this case increased cleaning, which is in turn reflected in the responses to contamination items.

4.3. Internet sample

Our earlier study involved a large Internet sample (Williams et al., 2005) where subjects were self-selected and non-representative (Couper, 2000), a potential confound in that particular study and studies like the NADSD one described earlier (Ritsher et al., 2002). And, as in most Internet studies, in our early study there was no way to ensure that respondents were honestly reporting demographic variables. In contrast, for the current study the Internet was the ideal medium because not only were participants selected at random for representation stratified geographically, but many extraneous experimental variables were eliminated. Prior work has demonstrated that race and gender of the experimenter, perceived experimenter attitudes, race of co-participants (tokenism effects), and many other cues can affect outcomes in studies designed to measure the effects of group membership (Osborne, 2001). As an Internet-based study, this investigation is rel-

atively free of such biases (Gosling, Vazire, Srivastava, & John, 2004). Additionally, the short length of this measure reduces the likelihood that participants would forget about the priming condition and eliminates confounds introduced when many additional batteries are included. Furthermore, computer administration allows items to be randomly ordered and prevents questions from being answered out of order, another factor that could spoil such an experimental manipulation.

4.4. Limitations of study

The smaller sample size for White participants is a limitation of this study. Due to restrictions on the number of respondent-minutes permitted by the TESS protocol, it was necessary to optimize the number of respondents versus survey length. Determination of the minimum survey length then determined the maximum number of participants that could be included. A proportionately larger number of African American subjects were necessary to detect differences in mean scale scores due to salience of race. Although not enough White participants could be included to determine if this manipulation caused significant differences in their scores, our studies with larger samples indicated White participants would be unaffected (Williams et al., 2005). Nonetheless, a larger sample of European Americans would have been useful to document the race by salience condition interaction effects in our analysis.

Although prior work indicates that OCD measures are racially biased, it is possible that these differences are reflective of some actual pathological anxiety that is greater in African Americans. Comparing scores to external variables, such as occupational or social dysfunction, would be needed to completely rule out this possibility.

The result of our experimental manipulation supports the hypothesis that racial salience is a factor in Black over-endorsement of washing and contamination items. Although we believe that differences in scores between the two experimental conditions is a result of unconscious processes, it could be that African Americans are intentionally over-endorsing washing items to appear less stereotypical, which would be presentation bias rather than a traditional priming effect. This study is not able to adequately differentiate between these possibilities. A study involving a sensitive post-experiment interview may be one way to investigate this further.

4.5. Implications for clinical and research applications

These findings may be troubling to clinicians and researchers seeking a means of screening African Americans for obsessive-compulsive traits. It is likely that most African Americans given these measures will appear obsessive-compulsive. Questions about obsessive-compulsive tendencies should focus on subjective distress and time spent on compulsions rather than on specific behaviors.

Racial consciousness in this study was activated by the presence of ethnic identification items on a computer-administered questionnaire. However, in a clinical setting, many factors could trigger a compromised response, resulting in even greater diagnostic error. The race of the clinician, rapport, clinical setting, the patient's understanding of the purpose and possible outcome of the assessment could also be factors (Whaley, 2001). Majority-group clinicians should use sensitivity and discretion with minority clients.

4.6. Summary

This study demonstrates that in a nationally representative sample, African Americans score significantly higher than European Americans on the contamination and washing scales on the Padua Inventory and Obsessive-Compulsive Inventory, short version. Over-endorsement occurs across all washing and contamination items, and is greater when awareness of ethnic and racial identification is increased. Clinicians and researchers should use such measures with caution in African Americans. Experimental evidence suggests that over-endorsement is due in part to the salience of ethnic and racial information. Further study is needed to identify additional factors contributing to these differences.

Acknowledgments

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