Comparing symptoms and emotion recognition in African American and White samples with schizophrenia

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Abstract

Racial status has an important role in schizophrenia, with African American samples being rated lower than White participants on a range of constructs. In many studies, however, demographic factors are not accounted for. In the current study, African American (n = 106) and White participants (n = 81) were compared on symptom severity and emotion recognition scales while controlling for other demographic factors. Contrary to our hypothesis, there were no differences in symptoms between racial groups. However, White participants performed better on an emotion recognition measure than African Americans. These differences were most prominent in response to negatively-valenced stimuli. This study replicated previous findings of racial differences in emotion recognition but not symptom severity. Future research should assess the role of racial identity on symptom severity. Additionally, further research is needed to assess if utilizing multi-ethnic stimuli improves performance by racial minorities on emotion recognition measures.

Keywords: Race, emotion recognition, symptoms, schizophrenia

Racial status has an important role in schizophrenia presentation. Compared to White participants, African Americans are more likely to be rated by clinicians as having more severe symptoms (Barrio et al., 2003) and perform worse on emotion recognition tasks (Pinkham et al., 2017). Regarding symptoms, past studies have shown that racial differences are more likely to manifest when item-level differences—rather than overall psychosis scores—are compared (Nagendra et al., 2018). Specifically, African Americans have been rated higher on hallucinations, suspiciousness, and delusions than their White counterparts (Barrio et al., 2003; Perlman et al., 2016). Although Perlman and colleagues (2016) assert that these differences are due to ascertainment bias rather than true participant-level differences, further research is needed.

Emotion recognition, a key aspect of social cognition, is also impacted by racial status. Social cognition is a core deficit in schizophrenia (Green, Horan, & Lee, 2019; Savla et al., 2013), and emotion recognition represents the social cognitive component that focuses on perception of affective cues (Green et al., 2008). Regarding racial differences, Pinkham and colleagues (2017) found that African Americans performed worse than Whites regardless of diagnosis on emotion recognition measures that used only White male stimuli. Two separate studies have posited that only seeing stimuli of individuals from the opposite race leads to poorer social cognitive performance (Elfenbein & Ambady, 2002; Pinkham et al., 2008), a phenomenon termed the "other race effect."

One limitation of previous research is the lack of demographic data (see Gara et al., 2012; Perlman et al., 2016), which is necessary to assert that group differences are due to racial status. Past studies have shown, for example, that adjusting for socioeconomic status partially explains why African Americans are diagnosed with schizophrenia more than their White peers (see

Bresnahan et al., 2007; Schwartz et al., 2019). The current study aimed to determine if differences in symptoms and emotion recognition exist between African American and White individuals with schizophrenia when controlling for demographic factors.

In the current study, we had two primary hypotheses. First, we expected African Americans to be rated higher than White participants on three symptoms: hallucinations, delusions, and suspiciousness. Second, we hypothesized that African Americans would perform worse than Whites on an emotion recognition measure that uses only White facial stimuli. This study uniquely contributes to the literature by highlighting racial differences in schizophrenia on clinician-rated and performance-based assessments. Further, this study controls for demographic factors to test if disparities in symptom severity and emotion recognition are due to race. Finally, using large samples to compare African American and White participants on key constructs in schizophrenia is a critical step in assessing how scores may vary due to race.

Methods

Participants and procedure

Participants were recruited from a Midwestern Veterans Affairs Medical Center (VA) (*n* = 187). This data consists of participants enrolled in three studies between 2004 and 2016 (see Authors, 2018; Authors, 2005; and Authors, 2013). Two of these studies were treatment studies (using vocational rehabilitation and cognitive-behavioral interventions) and one was an assessment study examining social cognitive performance. For treatment studies, we included data solely from baseline assessments (i.e., pre-intervention). For participants who were in multiple studies, we only included data from their earliest study (e.g., those who participated in all three studies would only have data included from the first study).

Included participants in the final sample had confirmed DSM-IV diagnoses of schizophrenia (*n* = 125, 67%) and schizoaffective disorder (*n* = 62, 33%). Exclusion criteria were: age < 18; current substance dependence; intellectual disability (IQ <70); change in outpatient or medication status within 30 days of baseline; and incomplete baseline data for demographics, symptom severity, or emotion recognition. For this study, participants had to self-identify as White or African American (*n* excluded = 4). The overall sample was predominantly African American (*n* = 106, 57%), male (*n* = 165, 88%); never married (*n*= 91, 49%) or divorced (*n* = 75, 40%); and had attained a high school education or higher (*n* = 166, 89%). Table 1 lists comparisons for African American (*n* = 106) and White (*n* = 81) groups. Study procedures were approved by the Institutional Review Board and informed consent was obtained before the onset of study procedures.

Measures

Symptoms were assessed using a gold-standard measure, the Positive and Negative Syndrome Scale (PANSS; Kay et al., 1987). The PANSS is a 30-item semi-structured interview that generates reality distortion, negative, and disorganized symptom scores in addition to an overall symptom severity score. Scores for items range from 1 (absent) to 7 (severe). Prior to conducting ratings, doctoral students rated videos of past PANSS administrations and had to achieve good ($\alpha = .80$) inter-rater reliability.

Emotion recognition was assessed using the Bell-Lysaker Emotion Recognition Task (BLERT; Bell et al., 1997). The BLERT consists of 21 video vignettes of an actor repeating a singular phrase using various vocal tones and facial expressions to portray different emotions. Participants then choose one of seven emotional states that were depicted during the clip: happy, sad, angry, afraid, surprised, disgusted, or neutral. Participants receive a score of zero for

incorrect answers and one for correct answers. A participant can receive a maximum score of 21, with higher scores indicating better performance.

Analyses were conducted in two parts. First, our team conducted *t*-tests and chi-square analyses to assess demographic and clinical differences between participants. Second, independent *t*-tests were utilized to determine significant group differences in symptom severity and emotion recognition. ANOVAs were used when it was necessary to control for demographic variables that varied between groups.

Results

Prior to aggregating studies, we tested if samples differed on demographic or clinical variables. No significant differences were observed between studies in sex, race, education, income, reality distortion symptoms, negative symptoms, hallucinations, emotion recognition, or recognition of negative emotions. There were significant differences between two studies in mean age, disorganized symptoms, delusions, suspiciousness, and recognition of positive emotions. **In each instance, differences were between Study 1 and one other study. The pattern of differences was inconsistent—with those in Study 1 demonstrating less severe delusions and suspiciousness, but worse positive emotion recognition and more severe disorganized symptoms compared to participants in Study 2 or 3 (see Supplemental Table 1).** None of these differences altered observed findings when controlled for in post-hoc analyses.

African American and White participants did not differ on gender, age, education level, or diagnosis. White participants did report greater monthly income than African Americans. For hypotheses that reached the level of statistical significance, we conducted additional analyses controlling for income.

Table 1

Demographics, symptoms, and emotion recognition by race

	African American[a]	White[b]	Test statistic	*p*-value
Age	48.42 ± 10.09	47.70 ±10.20	-0.48	0.63
Sex (% Male)	86.79%	90.12%	0.49[c]	0.48
Education	12.46 ± 2.10	13.00 ± 1.81	1.84	0.07
Income	US$871 ± 903	US$1149 ± 1021	1.97	0.05
PANSS symptoms				
Reality distortion	16.23 ± 4.42	16.86 ± 4.52	0.97	0.33
Negative	19.71 ± 5.26	20.19 ± 5.02	0.63	0.53
Disorganized	18.09 ± 4.25	18.84 ± 4.40	1.17	0.24
Reality distortion				
Delusions	3.28 ± 1.38	3.26 ±1.39	0.12	0.91
Hallucinations	2.72 ±1.45	2.78 ±1.18	0.31	0.76
Suspiciousness	3.76 ±1.23	3.74 ± 1.12	-0.13	0.90
Emotion recognition				
Total BLERT*	11.96 ± 3.82	13.72 ± 3.25	3.31	0.001
Positive BLERT	4.38 ± 1.29	4.65 ±1.04	1.60	0.12
Negative BLERT*	5.92 ± 2.52	6.85 ± 2.29	2.59	0.01

Notes. Data are presented as M ± SD for all variables.

Abbreviations: PANSS, Positive and Negative Syndrome Scale; BLERT, Bell-Lysaker Emotion Recognition Task.

[a]*n*=106. [b]*n*=81. [c]chi-square statistic.

* p < 0.05.

Hypotheses that African Americans would exhibit greater delusions, $t(185) = -0.13$, $p = 0.905$, $d = 0.01$, hallucinations, $t(185) = 0.31$, $p = 0.759$, $d = 0.05$, and suspiciousness, $t(185) = -0.13$, $p = 0.897$, $d = 0.02$, were not supported. In accordance with our hypothesis, White participants performed better on the BLERT than African American participants, $t(185) = 3.31$, $p = 0.001$, $d = 0.50$. Post-hoc analyses showed that African Americans performed worse when identifying negative emotions, $t(185) = 2.59$, $p = 0.010$, $d = 0.39$, but not positive emotions, $t(185) = 1.58$, $p = 0.116$, $d = 0.23$. When controlling for income, African Americans still performed worse on the total BLERT, $F(1,184) = 10.00$, $p = 0.002$, and on negative emotion items, $F(1,184) = 5.89$, $p = 0.016$. After controlling for income, race explained five percent of the variance in total BLERT performance.

Discussion

This study examined the impact of race on symptom severity and emotion recognition. Two key findings emerged. First, counter to previous literature (Barrio et al., 2003; Perlman et al., 2016), African American and White participants were not rated differently on hallucinations, delusions, or suspiciousness. Second, African American participants performed significantly worse on the BLERT than White participants. Specifically, African American participants were worse at correctly identifying negative emotions.

There is a growing body of literature focused on racial differences in schizophrenia. In contrast to previous research, we observed no differences in symptom severity for African American and White participants. One potential explanation why our findings differed centers on how income was measured. For example, Barrio and colleagues (2003) used Medicaid eligibility

as a proxy for income, whereas we included monthly reported income for each participant. Given that socioeconomic status partially mediates the relationship between race and schizophrenia prevalence (see Bresnahan et al., 2007), future studies should implement a uniform metric for assessing income (e.g., monthly or annual income, Hollingshead Index to assess socioeconomic status).

Our emotion recognition finding replicates Pinkham and colleagues (2018) analyses showing that racial minorities performed worse on social cognitive tasks with strictly White stimuli. Given that race emerged as the only significant demographic factor in emotion recognition performance, greater consideration must be given to developing culturally competent stimuli for social cognitive measures. Pinkham and colleagues (2018) found no racial differences in social cognitive performance when stimuli were racially diverse. Measures with racially diverse images, speech samples, and vignettes should be used in future social cognitive research. Researchers and clinicians who continue to use the BLERT to assess social cognition in racial minority populations should be cautious when interpreting results.

An unexpected finding was that African American participants showed impaired accuracy recognizing negative, but not positive, stimuli. A combination of factors may help explain this finding. First, previous studies suggest that it is harder to correctly identify negative emotions compared to positive emotional stimuli—regardless of race (see Johnson, Devir, & Karayanidis, 2006). Second, the BLERT asks participants to select from a list containing more negative than positive emotions. Third, the other race effect posits that people exhibit impaired recognition of emotional responses by individuals of a different race (Elfenbein & Ambady, 2002). Thus, African Americans may have performed on par with White participants when the choices were less difficult and fewer viable options were available (i.e., positive stimuli).

However, the challenge of identifying White facial stimuli might be more salient as choices increase in difficulty—leading to a depletion of cognitive resources. Future research should assess if African Americans still exhibit impaired emotion recognition on an assessment that contains a balanced presentation of positive and negative emotional stimuli.

This study added to the literature by assessing the role of race independent of other demographic factors. By controlling for income, we could parse out if racial minority status or lower social status negatively impacted the experiences of individuals with schizophrenia. However, it is important to note that Barrio and colleagues (2003) did control for age, income, and education level and still found African Americans higher on suspiciousness and hallucinations. Even so, key differences emerged between the two samples. Our sample was overwhelming male whereas the sample from Barrio and colleagues was more balanced (60% male). Additionally, our sample reported greater education than the Barrio sample (89% compared to 60% had at least a high school education). Finally, our sample reported greater monthly income despite inhabiting an area with a lower cost of living. Together, these factors may all lead to significant differences in symptom severity between these samples. More research utilizing people of different income levels and mixed genders is necessary.

Strengths of this study included the large sample consisting of demographically well-matched groups. However, this study also had limitations. First, our findings may not be generalizable to a mixed-gender or predominantly female sample due to the high percentage of men in our sample. A second limitation is the lack of data on ethnicity. Several studies on symptom severity in schizophrenia have begun to look at the differences between Afro-Latinos, African Americans, Afro-Caribbean, and White participants (Maraj et al., 2017). It is important to understand the role of ethnicity as well because the Black experience is diverse. By taking a

more nuanced look at racial minority experiences, we can assess how to better support individuals with schizophrenia diagnoses.

Conclusions

This study found racial differences on emotion recognition but not in symptom severity. These findings suggest that the other-race effect is a salient factor in BLERT performance. Racially diverse social cognitive assessments need to be utilized in clinical and research settings to prevent performance differences due to race. In line with Pinkham and colleagues (2018), the Penn Emotion Recognition Task (ER-40) —a measure of emotion recognition that uses pictures of racially diverse participants as stimuli— may be better suited for African American participants. Future studies should examine the role of ethnicity on self-reports of symptom severity and social cognitive performance. Additionally, future research should measure if these findings hold up across the schizophrenia-spectrum.

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ETHICAL APPROVAL: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

INFORMED CONSENT: Informed consent was obtained from all individual adult participants included in the study.

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