

Correlates of Attenuated Positive Psychotic Symptoms in a Non-Clinical Sample: Perceived Discrimination, Stress, and Substance Use

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Abstract—Early detection and prospective evaluation of individuals who may be at risk of developing psychosis are critical for efforts to isolate mechanisms underlying illness onset and for the testing of preventive interventions. The purpose of this study was to examine the relationship between perceived discrimination, stress, and substance use as psychosocial correlates for attenuated positive psychotic symptoms among a non-clinical sample of African American young adults. This study, using secondary data, consisted of 160 undergraduate participants from a Historically Black College and University (73.1% female, 26.3% male) ranging in age from 18 to 25 years. There were significant relationships between the scores on the discrimination, perceived stress, and substance use scales, and the total scores of a risk for psychosis measure. Discrimination and substance use scores were also significantly related to distress scores of the risk for psychosis measure. Gender differences in most frequently reported positive attenuated symptoms were reported.

Index Terms—psychosocial correlates, risk for psychosis, stress, substance use, African American.

I. INTRODUCTION

There exist cultural and racial differences in the prevalence, etiological/risk factors, and presentation of psychotic spectrum symptoms. For instance, higher prevalence rates of subclinical/attenuated psychotic symptoms (APS) were observed in African American youth in comparison to their Caucasian counterparts [1], [2]. African Americans endorse a greater severity of positive symptoms including auditory hallucinations and delusional ideations, even when assessed by ethnicity-blinded clinicians [3]-[8] found, using a retrospective assessment of prodromal features in African American patients with first-episode psychosis, that suspiciousness, problems with thinking, social withdrawal, and deterioration in role functioning were the most prevalent APS symptoms in this group. The North American Prodrome Longitudinal Study (NAPLS) directly compared African American and Caucasian youth who were at risk for psychosis and found that the African American youth were rated as having more severe positive symptoms including suspiciousness, grandiose ideations, and disorganized communication; and reported experiencing more daily stress [9]. These studies illuminated the uniqueness of African

Americans in their presentation of psychotic symptoms.

Psychosocial experiences affect the manifestation and presentation of mental illness symptoms. Research indicates that perceived discrimination may be a contributing factor to higher incidence of schizophrenia and other psychotic disorders within ethnic minority groups [10]-[12]. In assessing African Americans who experience psychotic symptoms, one must consider the impact of systematic enslavement, segregation, and oppression on mental illness. Exposure to discrimination can serve as a psychosocial stressor for African Americans, and what may start as a healthy and normative cultural response to discrimination can transform into the basis of a paranoid delusion for a psychotic illness. Social disadvantage, discrimination, adversity, and chronic stress may play a causal role in the development of psychosis [9]. Additionally, African American experiences of past abuses and perceived mistreatment by medical and mental health professionals may undergird mistrust. Mistrust of mental health professionals may be rooted in clinical discrimination which may lead to paranoia.

Thus, it is critical to understand the socio-contextual factors when evaluating the nature and severity of reported suspiciousness. It is also important to understand how an individual's background and relevant experiences should be considered to avoid mislabeling or misattribution of the source of paranoia. [13] suggests some forms of paranoia can be normal given the aforementioned challenges with exposure to discrimination. More significantly, perceived discrimination, as a psychosocial stressor for African Americans, can accelerate health deterioration by dysregulating biological stress pathways, specifically the hypothalamic-pituitary-adrenal (HPA) axis, leading to an elevated risk for psychosis [14].

Numerous studies have documented the relationship between perceived racial discrimination and various forms of substance use and abuse [15]-[17]. Research shows that individuals with psychotic illnesses have significantly higher rates of substance use in comparison with the general population [18]-[21]. A self-medication theory has been developed by researchers to explain this correlation. This theory suggests that stressful and discriminatory experiences may compel some individuals to abuse drugs to cope with negative emotions resulting from oppressive situations [22]-[24]. While there is a growing body of research detailing substance use and psychosis, sparse research has included or specifically mentioned African American young adult populations. Understanding the convoluted relationship between discrimination, stress, and substance use is

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important when working with African American young adults who are at risk for psychosis. These individuals may experience additional stress and discrimination as an effect of not only their race, but also the stigma of having a mental health diagnosis. Clinicians need to be careful to consider the full context of the individual's symptoms especially in the case of mistrust and cultural response to discrimination [9] and work to avoid making unwarranted judgments based on categories of race or ethnicity [25].

In addition to analysis of race and discrimination in clinical diagnosis and treatment, gender serves as a significant factor in understanding the comprehensive scope of mental illnesses. Differences between men and women in symptom manifestation reveal that women report more frequent anxiety and positive psychotic symptoms (such as "unusual anxiety", "worries", and "agitation"). Men tend to experience issues with thinking and concentration, social withdrawal [26], poor baseline function [27], pronounced negative symptoms, inclination for comorbid substance abuse, reduced social functioning, and an earlier onset of psychosis [28]-[30]. Females, in comparison with men, report more perceptual abnormalities [31], auditory hypersensitivity along with 'magical thinking' [26], [32], affective symptoms, and a better prognosis than men [33]-[35]. Therefore, understanding if gender contributes to the correlates of APS among African American youth may provide insight into assessment and treatment or more effectively reduce bias in addressing women and men, and people of color at risk for psychosis.

The purpose of the study was to examine the relationship between attenuated positive psychotic symptoms and perceived discrimination, stress, and substance use among African American young adults. We also examined gender differences in these relationships.

II. METHOD

A. Participants and Procedures

This study used an existing data set which examined psychosocial risk factors for psychosis. The initial data were collected with Florida A&M University Institutional Review Board (IRB) approval (IRB number: 013-71) and permission of the professors. The participants first reviewed and signed the consent form and then completed the questionnaires (hard copy) in group format. We obtained additional IRB approval (IRB exempt) to use the existing data set to conduct the current analyses. Participants in this current study included a convenience sample of 160 African American students from a Historically Black College and University located in the Southeastern region of the US. Our participants represented African American college-age students in general. The sample consisted of 73.1% female students and 26.3% male students ranging in age from 18-25 ($M=21.5$; $SD=4.6$), which represented the gender ratio of social science colleges. Among them, 21.2%, 23.4%, 17.3%, 30.7% were freshman, sophomore, junior, and senior students, respectively; about 8% did not provide classification information.

B. Measures

Demographic Questionnaire. The demographic questionnaire included general information items such as age,

gender, religion, annual family income, marital status, etc.

Everyday Discrimination Scale. The Everyday Discrimination Scale [36] measures perceived discrimination. The nine items on a 6-point Likert scale describe daily negative experiences. A sample item is, "You are treated with less respect than other people." The Everyday Discrimination Scale has been consistently and positively associated with adverse mental health outcomes among African Americans [37]. Adequate psychometrics were reported [38] [39]. The participant alpha was also sound (Cronbach's $\alpha = 0.84$).

Perceived Stress Scale. The Perceived Stress Scale [15] is comprised of nine questions (5-point Likert scale) that measure feelings and thoughts over the past month that are indicative of stress. Proper participant internal consistency was obtained (Cronbach's $\alpha = 0.80$).

Substance Use. The substance use questionnaire utilized a binary (e.g., yes/no) scale for each of the following substances over the past month: heroin, methadone, other opiates, barbiturates, sedatives, hypnotics, tranquilizers, cocaine, amphetamines, cannabis, and hallucinogens. A total score was tallied based on participant responses with a higher score indicating more types of substance used.

Prodromal Questionnaire-Brief (PQ-B). The PQ-B is a 21-item self-report screening measure for positive symptoms, indicating risk for psychosis [40]. PQ-B yields two scores. First, respondents indicated the presence or absence of symptom items with a "yes/no" response. A sample item is "Do familiar surroundings sometimes seem strange, confusing, threatening, or unreal to you?" All responses to the 21 items are summed to calculate a total (symptoms) score. Second, for each endorsed symptom, participants then indicate in a follow up question the extent to which the symptom causes distress on a 5-point Likert scale (strongly disagree, disagree, neutral, agree, strongly agree). The total distress score is the sum of responses to these follow-up questions. Therefore, as a screening tool, the PQ-B is rated by using the total number of endorsed items (range: 0-21), the number of items that are identified as distressing (range: 0-21), and the total distress score (range: 0-105). The current study showed adequate internal consistency, as evidenced by a participant alpha of .85 for total symptom score and .83 for distress score.

III. RESULTS

The researchers conducted analyses using the IBM Statistical Package for Social Sciences (SPSS), v.27. Correlation and multiple regression analyses were conducted to examine the relationship between discrimination, perceived stress, substance use, and risk for psychosis. Table 1 displays substances used by participants in the 30 days prior to data collection. The findings show discrimination, perceived stress, and substance use are positively and significantly correlated with the PQ-B total score (number of positive symptoms).

Table II provides means and standard deviation scores for the PQ-B, Perceived Stress Scale, discrimination, and substance use. Discrimination and substance use are significantly and positively correlated with the risk for psychosis distress score.

TABLE I: SUBSTANCES USE INFORMATION

Substance	Have used substance in past 30 days (%)	Have not used substance in past 30 days (%)
Methadone	3	97
Heroin	2	98
Other opiates	10	90
Barbiturates	4	96
Sedatives	4	96
Cocaine	4	96
Amphetamines	5	95
Cannabis	28	72
Hallucinogens	11	89

TABLE II: MEAN AND STANDARD DEVIATION SCORES OF PQ-B, PERCEIVED STRESS, DISCRIMINATION AND SUBSTANCE USE

	Mean	Standard Deviation	N
PQ-B Total Score	4.95	4.8	153
PQ-B Distress Score	16.8	18.2	150
Perceived Stress	29.3	6.8	153
Discrimination	4.75	3.0	153
Substance Use	2.8	1.5	148

Table III summarizes the correlational results. The multiple regression model with all three predictors produced $R^2 = 0.191$, $F(3, 140) = 11.0$, $p < .000$. Discrimination, perceived stress, and substance use have significant positive Beta regression weights (0.92, 0.82, 0.15, respectively) and predict reported PQ-B positive symptoms, such as sensing person or force around him/her, or going off track when talking, or not being in control of one's ideas/thoughts. Gender, however, did not contribute to the significance of the multiple regression model.

TABLE III: CORRELATIONS AMONG DISCRIMINATION, PERCEIVED STRESS, SUBSTANCE USE, AND RISK FOR PSYCHOSIS

	PQ-B Distress Score	Discrimination	Perceived Stress	Substance use
PQ-B Positive Total Score	0.595**	0.263**	0.288**	0.285**
PQ-B Distress		0.234**	0.126	0.445**
Perceived Discrimination			0.316**	0.162
Perceived Stress				0.079
** $p < 0.01$				

Descriptive analysis of gender comparisons in symptom endorsement revealed commonalities in two of the top five most-cited symptoms. A common endorsed item from both male and female participants was "Feeling mistrustful or suspicious of other people" (see Table IV). Similarly, 41% female and 42.9% male participants endorsed the item: "Feeling that other people are watching/talking about you".

TABLE IV: TOP FIVE MOST CITED POSITIVE SYMPTOMS BY GENDER

Male	Number & Percentage	Female	Number & Percentage
Have strong feelings or beliefs about being usually gifted or talented in some way.	19 (45.2%)	Feel that other people are watching you or talking about you.	48 (41.0%)
Feel that other people are	18 (42.9%)	Find yourself feeling mistrustful	44 (37.6%)

watching you or talking about you.		or suspicious of other people.	
Your thoughts are sometimes so strong that you can almost hear them.	17 (40.5%)	Feel that parts of your body have changed in some way, or that parts of your body are working differently.	36 (30.8%)
Find yourself feeling mistrustful or suspicious of other people.	17 (40.5%)	People sometimes find it hard to understand what you are saying.	34 (29.1%)
Have had the sense that some person or force is around you, although you couldn't see anyone.	16 (37.3%)	Have been confused at times whether something you experienced was real or imaginary.	32 (25.4%)

Due to the imbalanced gender in the current study, we were not able to do parametric analyses of gender differences in the relationship between perceived stress, discrimination, and substance use and risk for psychosis. Separate Pearson Moment Product correlation analyses for females and males indicated that female participants' risk for psychosis was significantly correlated with perceived stress, discrimination, and substance use and their total distress scores were significantly correlated with discrimination and substance use. Males' risk for psychosis and distress level, on the other hand, were only positively and significantly correlated with substance use. See Table V for full results of study.

TABLE V: THE RELATIONSHIP BETWEEN PERCEIVED DISCRIMINATION, STRESS, AND SUBSTANCE USE AND RISK FOR PSYCHOSIS: FEMALE RESULTS AND MALE RESULTS

Female				
	PQ-B distress score	Discrimination	Perceived stress	substance use
PQ-B positive total score	0.62**	0.36**	0.23*	0.41**
PQ-B distress score		0.24*	0.12	0.39**
Male				
PQ-B positive total score	0.54**	0.20	0.49	0.33*
PQ-B distress score		0.23	0.19	0.47**

IV. DISCUSSION

This study examined the interconnected cycle of psychosocial factors that may contribute to African Americans' risk for psychosis [41]. Consistent with the literature, our results show that higher levels of perceived discrimination, perceived stress, and substance use are significantly correlated with higher risk for psychosis. Additionally, perceived discrimination and stress are significantly correlated with risk for psychosis distress score in African American young adults [12], [42]. This indicates that those who reported higher levels of perceived discrimination and stress tend to feel more distressed by the positive symptoms than those who reported lower levels of discrimination and stress.

The results of this study indicate that perceived stress is related to risk for psychosis in African Americans. Research shows that stress increases the HPA axis in the body, leading to an increase of cortisol levels in the brain, thus increasing the risk for psychosis [43]-[45]. However, there is less research emphasis on culture in the context of stress and its relationship to mental illness, in general, and risk for psychosis, in particular. An unexpected finding is that PQ-B distress scores are not significantly related to perceived stress. One explanation is the two PQ-B distress and perceived stress measure different types of stress. Specifically, the former assesses positive symptoms such as suspiciousness, grandiosity, disorganized communication, unusual thinking, and perceptual disturbances [40]; while the latter measures the degree to which daily life situations are considered as stressful. The relationship between perceived discrimination and risk for psychosis may be particularly magnified in African Americans, as evidenced by African American youth reporting more perceived discrimination [46] and having more suspiciousness than Caucasian youth [46], [46]. Considering the centuries of oppression and racism experienced by African Americans in the US, heightened suspiciousness may serve as an adaptive function [39], complicating the attempts to use suspiciousness as an indicator for elevated risk for psychosis. [44] referred to this experience as “healthy cultural paranoia,” suggesting that experiencing discrimination contributes to the level of suspiciousness endorsed by African American individuals with and without psychosis, possibly confounding the assessment if not carefully considered [14]. The suspiciousness and mistrust that African Americans experience can be a result of historical persecution and contemporary struggles with institutional discrimination [43]. When assessing African Americans’ risk for psychotic symptoms, particularly paranoia and suspiciousness, it is imperative to do so through a cultural and historical lens. This study, in conjunction with prior research, highlights that African Americans diagnosed with and at risk for psychosis may differ from other ethnic groups in the US regarding prevalence, etiological/risk factors, and symptom presentation. Future research efforts should examine the role of cultural factors in the presentation of mental illness, specifically psychosis. As research continues to progress, clinicians will be better able to develop tailored treatments or adapt existing interventions for African American youth by incorporating patients’ beliefs, values, cultural experiences, and treatment preferences.

In considering the discrimination reported by our majority female sample, it is necessary to look at the intersectionality of gender and race, which could compound the experience of discrimination. Sexism, or the prejudice or stereotyping against women on the basis of sex, is linked to psychological distress, anxiety, anger, obsessive-compulsivity, somatic symptoms, and depression [44], [45]. When combined with the devastating effects of racism, African American women have been found to have elevated levels of stress and psychological distress with both racism and sexism, in comparison to just sexism alone [46]. This is consistent with our finding that females’ risk for psychosis was significantly correlated with discrimination, stress, and substance use, while males, on the other hand, was only positively correlated

with substance use. Nevertheless, due to the imbalanced gender of our sample, we were not able to conduct parametric analysis to examine if there were significant differences between female and male participants in topics discussed above. Further research should continue to consider the unique experience of African American women and men, whose risk for psychosis could be impacted by the intertwining threat of both racism and sexism.

The social defeat theory explains that in experiencing discrimination and stress, individuals may cope by using substances [46]. This theory reinforces the well-established connection between substance use and risk for psychosis among young adults [19], [24], [46]. Our results also reveal that substance use is positively related to risk for psychosis and psychological distress. Additional research focusing on the impact of culturally relevant psychosocial resources on buffering the effects of discrimination and stress, and facilitating adaptive coping is critical to gaining additional insights regarding this relationship in African American young adults.

There are several limitations to the current study which can affect the interpretation and generalization of the results. First, the majority of the participants were women. Therefore, caution needs to be taken when interpreting our results to avoid overgeneralization. Second, we used a convenience sample of non-help-seeking young adults rather than a clinical high-risk sample. Third, the PQ-B is a self-report screening measure initially designed to be a part of a two-stage process (i.e., plus an in-depth psychosis-risk interview) to evaluate psychosis-risk, of which we used as a measure of prodromal or attenuated positive psychotic symptoms rather than psychosis-risk. Future studies can include the second stage psychosis-risk interview.

Lastly, our study took place in the United States, and may not be generalizable to other countries.

V. CONCLUSION

Despite the limitations of the study, our study is among the first to examine psychosocial correlates of attenuated psychosis symptoms in a vulnerable population. The results can inform researchers and clinicians when they work with African American young adults with mental health challenges. It is with hope that this study adds to the body of literature that considers culture, social experience, and environment in the development, assessment, and treatment of psychosis; and that the research contributes to the scholarship of social science and humanity from a global perspective. This work lays a foundation for the importance of establishing culturally-adapted interventions to treat youth at-risk for psychosis where it has not been well developed. We hope to highlight the importance of clinicians being sensitive to the experiences of African Americans during initial assessments and throughout the critical intervention period. Future research should consider not only examine the impact of stress caused by discrimination, but also the effects of the current racial tension that exist in the United States, which has been amplified by a global pandemic-COVID-19. Future research should also consider cross cultural studies in countries, particularly Europe, which have large populations of African immigrants.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

C.L and H.L conceived and planned the study under H.L supervision. C.L took the lead in writing the manuscript. All authors provided critical feedback and helped shape the research, analysis, and manuscript.

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