Ethnic/Racial Differences in Psychiatric Disorders: A Test of Four Hypotheses

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Objectives: Ethnic/racial differences in the prevalence of psychiatric disorders have been reported in hospital studies conducted in the United States, but general population studies find little or no evidence of higher rates of disorder in Black communities than White communities. Thus, ethnic/racial differences in the prevalence of psychiatric disorders in treated samples may be due to biased estimates. Aside from sampling bias, 4 hypothetical models of ethnic/racial differences may account for such bias: sociocultural, self-selection, social selection, and clinician bias. The present article reviews and performs limited tests of these 4 models.

Design: Paranoia is considered a key symptom in biases associated with ethnic/racial differences in psychiatric disorders. Black, Latino, and White community and patient samples are compared, via secondary analysis of data from an epidemiologic study, in terms of their expression of a range of paranoid symptoms.

Participants: The study sample consisted of 404 community residents, 96 patients with major depression, and 65 patients with nonorganic, nonaffective psychotic disorder (mainly DSM III schizophrenia).

Main Outcome Measures: Hypothesis-testing involved 2 approaches: 1) standard significance tests of mean differences between groups; and 2) an analysis of the patterns of mean scores across the paranoia scales from the Psychiatric Epidemiology Research Interview by ethnic/racial group and diagnostic category.

Results: The results of this study favor the sociocultural explanation of bias associated with ethnic/racial differences in psychiatric disorders.

Conclusion: To reduce disparities in ethnic/racial patterns of psychiatric hospitalizations, the biases associated with differences in the sociocultural backgrounds of providers and patients need to be addressed. (*Ethn Dis.* 2003;13:499–512)

Key Words: Blacks, Bias, Hospitalization, Latinos, Paranoia, Psychiatric Disorders

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Introduction

Ethnic/racial differences in rates of psychiatric disorders in the United States (US) are largely attributable to the over-representation of some ethnic/racial minority groups among users of inpatient mental health services.[1–3] The National Comorbidity Survey (NCS)[4] and the Epidemiological Catchment Area study (ECA)[5] of the prevalence of psychiatric disorders in the US general population show little or no ethnic/racial differences, and in some cases lower rates for minority groups, in contrast to those found among hospitalized treated cases. Therefore, conclusions about differences in rates of psychiatric disorders in ethnic/racial minority groups, based on data from treated samples, are possibly the result of the "clinician's illusion" or over-generalizations from chronic patient samples to the general population.[6] Alternatively, due to the under-representation of certain groups like Black males, it is possible that household samples lead to underestimates of disorders in ethnic/racial minorities.[7] In either case, the disproportionate number of ethnic/racial minority inpatients in mental health settings is a phenomenon of interest in its own right.

Ethnic/racial differences in psychiatric hospitalization rates may reflect some type of bias in case identification. To date, no attempt has been made to set forth a comprehensive set of hypotheses about the possible biases. Aside from sampling bias, there are 4 hypothetical models that provide strong leads. These models, which will be described below, are the sociocultural, social selection, self-selection, and clinician bias. Taken together, these models provide a comprehensive view of the possible explanations for the role of bias in ethnic/racial differences in treated cases of psychiatric disorders. The purpose of this article is to review and perform limited tests of hypotheses based on these 4 models.

Paranoid Symptoms and Psychiatric Disorders

Several researchers have advocated the study of symptoms independent of their association with psychiatric syndromes.[8–10] Analyses of psychiatric conditions at the symptom level, as well as in the context of diagnostic syndromes, may prove to be a useful alternative to an exclusive focus on the latter. Tateyama et al[11] reported findings from a cross-national study of practices by Japanese and European psychiatrists suggesting that diagnostic procedures in the West tend to focus more on presenting symptoms, especially paranoid symptoms. Moreover, paranoid symptoms may also play an important role in ethnic/racial differences in psychiatric disorders.[12–14] Paranoia may be a key symptom in determining diagnostic outcomes in Western countries, especially among diverse ethnic/racial groups.

Recent theoretical arguments have also linked paranoid symptoms to de-

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pression, as well as schizophrenic disorders.[15–17] Empirical support for these arguments comes from studies that examine paranoid symptoms across diagnostic subgroups of psychotic, depressed, and normal individuals.[18,19] Moreover, Ridley[13] posited that Black Americans' paranoid symptoms may, in some instances, reflect cultural responses and serve as a self-protective function against racism. Consistent with this possibility, some symptom-level research indicates that paranoia may be more strongly associated with diagnoses of depression in Blacks than Whites.[20] For these reasons, special attention will be focused on the role of paranoid symptoms in hypotheses drawn from the 4 models of bias associated psychiatric disorders.

Specifically, predictions about ethnic/racial differences in psychiatric disorders will be derived from these 4 models, and will be examined by comparing Black, Latino, and White community and patient samples in terms of their expression from a range of self-reported paranoid symptoms. The multiple measures of paranoia are taken from the Psychiatric Epidemiology Research Interview (PERI).[21,22] This research is based on secondary analyses of PERI data from a case/control study of risk factors for schizophrenia and depression in both community and patient samples.[23] Mild, moderate, and severe forms of paranoia among depressed and psychotic patients provide an opportunity for both *symptom* level and *syndrome* level analyses. Methodological concerns about the study design will be spelled out in the discussion of the different models of bias that may account for ethnic/racial differences in psychiatric disorders.

A COMPREHENSIVE REVIEW OF MODELS OF ETHNIC/RACIAL BIAS

The 4 models of potential bias are sociocultural, self-selection, social selection, and clinician bias. These models were derived from a combination of the authors' clinical experiences and reading of the psychiatric literature. All of these models assume that some type of bias is operating to produce ethnic/racial differences in psychiatric disorders. Presumably, this bias tends to occur at the symptom level. The present article identifies paranoia as a symptom which is susceptible to bias. The hypotheses are delineated in terms of symptom expression on the 3 PERI paranoia scales for 3 different ethnic/racial groups. A discussion of critical aspects of the study design precedes the delineation of hypotheses including: a) a focus on symptoms of paranoia; and b) the incorporation of a Latino group.

Bias and the Continuum of Paranoia

The scales are the Distrust (DST) scale, which measures a lack of trust in others; the scale of Perceived Hostility of Others (PHO), which measures individuals' suspicion that they are treated with hostility by others; and nearest to paranoid delusions and hallucinations, the scale of False Beliefs and Perceptions (FBP), which measures perceptions outside of the ordinary and beliefs considered abnormal by Western cultural standards.[22] The DST can be considered a measure of "subclinical" paranoia in that it measures beliefs and behaviors that are not abnormal or pathological per se. High scores on the FBP, on the other hand, can be considered indicative of "pathological" paranoia, according to Western ideology, since items on this scale reflect experiences which fall outside the realm of ordinary experience. The PHO scale can be considered a measure of either "subclinical" or "pathological" paranoia, depending on the situation. A growing body of literature is available indicating that the PERI scales of DST, PHO, and FBP reflect mild, moderate, and severe levels of paranoia, respectively, in both patient and nonpatient samples.[20,24,25] Moreover, Whaley[25] found that the scale of DST at the mild end of the paranoid continuum is positively correlated with a measure of "cultural mistrust" in African-American psychiatric patients, whereas the scales of PHO and FBP are not. Additionally, the mild end of the paranoia continuum is more susceptible to cultural influences than the moderate and severe levels, according to evidence.[20]

Because symptoms of true psychopathology are less frequent in the general population, as well as being less susceptible to cultural influences, the mean scores on the PERI scales are expected to fall along a continuum of severity. Positive responses on the FBP scale occur least frequently in the general population, followed by the PHO scale, and then the DST scale for each ethnic/racial group.

Latino Populations and Bias in Psychiatric Diagnosis

Most studies of ethnic/racial differences in psychiatric disorders are limited to Black-White comparisons. Given the uniqueness of race relations historically, such comparisons are difficult because the bias in clinical diagnoses may be confounded with other types of prejudices such as racial stereotypes.[26–28] Consistent with this argument, psychiatric epidemiologic studies of ethnic/racial differences which include several different minority groups tend to show that

Black-White comparisons have unique features.[3] Whaley and Link[29] found that different stereotypes were emphasized for African Americans and Hispanics in a national study of attitudes toward homeless/homeless mentally ill people. White Americans tend to more frequently associate the stereotype of "violence" with African Americans, while associating the the stereotype of "laziness" more frequently with the Hispanic subgroup.[29] Inclusion of additional ethnic/racial groups, namely Latinos, may also provide a broader perspective on the biases operating in the psychiatric diagnoses of different cultural groups.

Several studies have examined the prevalence of psychiatric problems in Latino groups. Guarnaccia,[30] for example, discusses rates of psychiatric disorders among different Latino groups residing in the United States. In general, Puerto Ricans residing in the metropolitan New York area have been shown to have higher rates of disorder than those living in Puerto Rico, and higher than other Latino groups such as Mexicans and Cubans.[30–32] Fernandez-Pol[33] found, in her review of the literature, the rates of suicide among Puerto Ricans to be higher compared to Black and White residents of New York City. The ECA study found that Hispanic respondents had an overall prevalence of psychiatric disorders that were lower than Blacks and higher than Whites, but not significantly different from either group. Of particular note, the Hispanic subsample in the ECA study were mainly residents of Los Angeles, which means that they were predominantly Mexican Americans. Thus ethnic/racial differences in psychiatric disorders involving Latino groups may depend on which cultural subgroup is represented.

The patterns of results on psychiatric illnesses parallel other subcultural variations of within-group comparisons of Latinos. For example, Massey and Bitterman[34] reported that Puerto Ricans were more segregated than other Latino groups. Their data suggested that this difference can be explained by the fact that Puerto Ricans are similar to Black Americans in terms of African ancestry, low socioeconomic status, and residential locations near Black neighborhoods. Massey and Bitterman considered Puerto Ricans "bystander victims of Anglo prejudice against Blacks."[34(p326)] Consequently, any bias operating toward Black Americans in the identification of cases of psychiatric disorders will be similar, if not stronger, for Latinos of Puerto Rican heritage. The hypothesis that ethnic/racial bias affects Puerto Ricans more strongly than their African-American counterparts is consistent with past research comparing the mental health functioning of these 2 groups.[33] Puerto Rican residents of New York City may have poorer mental health functioning, in part, because of lower expectations of prejudice related to the diversity of racial classification in the group, and/or because they have less socioeconomic resources than their Black neighbors making them more vulnerable generally to the stresses and strains of life.

Sociocultural Hypothesis

The first model represents the sociocultural hypothesis that paranoid symptoms are more prevalent among individuals of disadvantaged social status, because there is a greater likelihood that interpersonal and social aspects of "paranoia" reflect accurately perceived real experiences.[12–14,35–37] Mirowsky and Ross[37] posited that feelings of powerlessness and concern about exploitation contribute to paranoid ideation among social and economically disadvantaged groups. The overrepresentation of Blacks and Latinos among these disadvantaged groups makes them more likely to exhibit paranoid tendencies. In addition, victimization associated with racism and oppression is another dimension of social disadvantage that may contribute to paranoid responses by members of ethnic/racial minority groups.

The Latino group consists of Puerto Rican residents of New York City who have been found to have higher rates of psychiatric disorders than other ethnic/racial groups.[30,32,33] Higher rates of paranoid symptoms in treated samples of Blacks and Latinos may therefore reflect bias that is a function of measurement invalidity, with these groups reporting actual events and experiences that should not be counted as psychiatric symptomatology. The PERI scales of DST and PHO tap this form of paranoia. Black and Latino individuals also differ from Whites in that they may be prone to what Ridley[13] refers to as "confluent paranoia," an interaction between cultural and pathological forms of paranoia. As a result, bias also may be reflected with Black and Latino patients evidencing higher scores on the FBP scale of the PERI.

Self-Selection Hypothesis

Another hypothesis is based on the "self-selection bias" model. According to this point of view, differential self-selection processes are involved in case identification for treated samples of different ethnic/racial groups. Black and Latino patients tend to come into treatment at more severe levels of psychopathology when self-referred or brought in by family members. Consequently, more severe symptoms of psychopathology, those associated with hospitalization, may be exhibited by them. Some epidemiological studies support this contention. Sussman, Robins, and Earls[38] conducted a community study of ethnic/racial differences in help-seeking for depression: Black respondents reported higher levels of depression and significantly longer delays in seeking treatment than White respondents. Strakowski et al[39] found that Black patients recruited for the DSM IV Field Trial for Schizophrenia and Other Psychotic Disorders exhibited more severe psychotic symptoms than White patients.

Social Selection Hypothesis

The "social selection bias" model suggests that psychiatric diagnoses are

influenced by stereotypical perceptions of different ethnic/racial groups. These social stereotypes tend to be more negative in the case of ethnic/racial minority groups. All persons who may come into contact with a psychiatric patient including agents of social control (eg, police) and clinicians share these culturally stereotypical perceptions. For example, a very common racial stereotype in White American culture is the notion that Blacks are prone to violence.[28,29] This particular racial stereotype has a significant impact on diagnostic and treatment decisions for the Black patient. Racial stereotypes about Black violence may cause a clinician to give a diagnosis of schizophrenia, to use restraints or seclusion, or to administer more p.r.n. (as needed) medication to African-American psychiatric inpatients.[27,28,40] Some researchers have demonstrated that African-American inpatients do not differ significantly in level of psychopathology from their European-American counterparts, when assessed objectively with the Brief Psychiatric Rating Scale.[40,41] Moreover, a study by Lawson and colleagues[41] revealed that African-American psychiatric inpatients exhibit significantly lower levels of violence than their European-American counterparts. Thus restrictive interventions imply more severe psychopathology than is warranted by objective assessments of Black patients. The same argument can also be made from a phenomenological perspective. Racial stereotypes about violent behavior may contribute to errors in clinical judgment regarding level of danger a patient my exhibit toward self or others, symptomatic of more severe psychopathology, than patients themselves may be experiencing. Skilbeck, Acosta, Yamamoto, and Evans[42] correlated therapists' diagnostic judgments with severity of self-reported psychiatric symptoms on the Symptom Checklist 90-Revised (SCL-90-R) by Black, Hispanic, and White patients. Overall, the strength of association was signficant and highest for White patients, less strong but significant for Hispanic patients, and nonsignificant for Black patients. Therapists' diagnoses of psychopathology were more severe than Black patients' self-reported symptoms on the SCL-90.

In addition, other social cues may activate stereotypes that lead to these judgments of more severe psychopathology among African-American patients. Ethnic/racial minority individuals taken to psychiatric emergency rooms by the police tend to elicit heightened stereotypical judgments in clinicians' diagnostic decisions resulting in a greater likelihood of hospitalization than their White counterparts.[43] At the very least, legal intervention alters the rate of admissions to psychiatric hospitals in the direction of more involuntary admissions for Black patients relative to White patients.[44] Because of the influence of negative racial stereotypes, regardless of the particular diagnosis, clinicians' threshold for escalation to case status is lower when they diagnose members of ethnic/racial minority groups. In other words, White patients have to exhibit severe symptoms to be judged a case, whereas patients of color with lower symptoms levels could be defined as a case because of the influence of negative stereotypes on judgments of psychopathology. Thus members of ethnic/racial minority groups will display, on average, milder symptoms than their White counterparts with the same diagnosis.

Clinician Bias Hypothesis

The final hypothesis, the "clinician bias" model, posits that biased clinical judgment is attributable to lack of familiarity with or improper application of diagnostic criteria.[20] Unstructured clinical interviews are the likely cause of errors in the use of diagnostic criteria in the DSM system. The unstructured nature of diagnostic interviews in clinical settings is more susceptible to errors and biases than more rigorous approaches used in research. Studies that compare unstructured clinical interviews to structured research interviews in the diagnosis of African-American patients indicate that misdiagnosis occurs most often in the former situation.[45–50]

Although both the social selection and clinician bias models are based on stereotypical judgments, the 2 models differ with regard to the source of the stereotype. The social selection model is based on stereotypes about different ethnic/racial groups, while clinician bias is derived from stereotypes about mental disorders or psychopathology. Two generalized notions are believed to underlie clinician bias. The first presumption is that all symptoms have exclusive associations with particular psychiatric syndromes.[51] Contrary to this notion, an analysis of the taxonomic structure of the DSM-III-R showed that psychiatric syndromes have overlapping symptoms.[51] The second presumption is that there are key symptoms that can represent the entire syndrome. When this occurs, a diagnosis is based on a single symptom that is believed to fully represent the psychiatric syndrome without consideration for other signs, symptoms, or criteria. Jampala, Sierles, and Taylor[52] found, indeed, in a random sample of US psychiatrists and graduating psychiatric residents that they tended to diagnose mental disorders based on a single symptom. Such stereotypical beliefs impact on the psychiatric diagnosis of patients from all ethnic/racial backgrounds, but the adverse diagnostic outcomes are more prevalent in the case of ethnic/racial minority individuals.

Auditory hallucinations, for example, are considered typical symptoms of schizophrenia. The occurrence of auditory hallucination in cases of bipolar disorder may lead to the incorrect assignment of a diagnosis of schizophrenia.[53] A number of studies have shown African Americans with bipolar disorders to be misdiagnosed with schizophrenia.[54,55] Mukherjee et al[46] reported that auditory hallucinations contribute

to diagnoses of schizophrenia in Black and Puerto Rican patients with bipolar disorder more than White patients. These errors can explain the overdiagnosis of schizophrenia and the underdiagnosis of affective disorder in African Americans reported in the literature.[3] Clinicians' lack of experience with culturally different groups may facilitate their reliance on stereotypical beliefs about the nature of psychopathology in their application of diagnostic criteria. Thus, clinician bias can lead to different distributions of specific types of psychiatric disorders in various ethnic/racial groups.

HYPOTHESIS-TESTING AND MODELS OF BIAS

Specific Hypotheses

The hypothesized rank orderings of mean scores on the scales of DST, PHO, and FBP in the community sample and patient sample which parallel the 4 models are displayed in the Appendix. All of the models or hypotheses predict that the PERI scales will fall along a continuum of severity with the lowest scores on the FBP scale, followed by the PHO scale, and the highest scores on the DST scale (as noted earlier, the greater the severity of the symptom, the lower the frequency, and hence, the lower the mean score). These models also predict differences between Blacks and Latinos with the latter group exhibiting more severe symptoms because this group consists mainly of Puerto Ricans, who have been shown to have higher rates of mental disorder.[30,33,56] All models, except the clinician bias model, predict that schizophrenic patients will score higher on the PERI paranoia scales than depressed patients.

Community Sample

The sociocultural perspective is the only one that predicts ethnic/racial differences on the PERI paranoia scales. White respondents from the community sample are predicted to display the lowest scores on the DST, PHO and FBP scales, followed by Black and then Latino respondents. By contrast, the self-selection, social selection, and clinician bias models all predict no ethnic/racial differences in paranoid symptom expression for the community sample. These latter 3 models have in common the fact that they require contact with the mental health system, so they are not applicable to untreated populations. Furthermore, the only differences in the community sample which are expected according to the self-selection, social selection, and clinician models are those due to symptom severity.

Patient Sample

The sociocultural perspective generates the following hypotheses for the patient sample: Black and Latino psychiatric patients are expected to score higher on the DST, PHO, and FBP than their White diagnostic counterparts with Latino respondents expected to score higher than their Black diagnostic counterparts. The self-selection bias perspective also hypothesizes that both depressed and schizophrenic Latino patients will score higher than similarly diagnosed Black patients, who, in turn, will score higher than White patients on the DST, PHO, and FBP scales.

The social selection bias perspective posits, in contrast, that Latino psychiatric patients are expected to score lower than Black patients, who, in turn, will score lower on the scales of DST, PHO, and FBP than their White counterparts. Within each psychiatric subgroup, the differences between ethnic/racial groups will be smaller relative to the differences across PERI scales. This latter effect can be attributed to the fact that the nature of psychiatric symptoms plays an important role above and beyond that of social stereotypes.

Finally, the clinician bias perspective predicts that Latino and Black schizophrenic patients will score lower on the measures of paranoia (DST, PHO, and FBP) than their White counterparts. However, White depressed patients will score lower on the PERI paranoia scales than Black and Latino depressed patients. In addition, within each psychiatric subgroup, differences across ethnic/racial groups will be greater than differences across PERI paranoia scales. Therefore, the disparity between scores on the PERI scales for schizophrenic and depressed patients will be greater among White patients than among their minority counterparts due to more misclassification for the latter groups.

METHOD

Overview and Research Design

The current study involves the secondary analysis of data collected for 2 previous studies. The original study was an epidemiological survey of mental health complaints in both patient and community samples as a part of a methodological study of psychiatric symptom inventories including the PERI.[22] This study has been referred to as the "methods study."[23] One or more eligible respondents were identified in 68% (N=943) of the households from telephone listings, and 57% (N=541) of these eligible respondents were successfully interviewed between 1980 and 1982. The second study was a "risk-factor study" of schizophrenia and depression in which participants from the original "methods study" were located and reinterviewed.[23] Approximately 79% (N=429) of the original community sample was located and reinterviewed for the "risk-factor study."[23] One case of nonorganic, nonaffective psychotic disorder and 24 cases of major depression were discovered in the community sample. These 25 cases were screened out causing another 6% reduction in the size of the sample (N=404).

Patients were mainly recruited from the outpatient clinic and from an inpatient community service at Columbia-Presbyterian Medical Center in the

Table 1. Sociodemographic characteristics of community and patient samples

Variables	Community Residents (*N*=404)	Depressed Patients (*N*=96)	Schizophrenic Patients (*N*=65)	Test of Significance
Ethnicity/race				
Latino	110 (27%)	25 (26%)	11 (17%)	χ^2=6.33
Black	122 (30%)	33 (34%)	29 (45%)	*P*=.176
White	172 (43%)	38 (40%)	25 (38%)	
Sex				
Female	227 (56%)	71 (74%)	34 (52%)	χ^2=11.37
Male	177 (44%)	25 (26%)	31 (48%)	*P*=.003
Marital status				
Never married, widow	101 (25%)	30 (31%)	34 (52%)	χ^2=20.43
Married or divorced	303 (75%)	66 (69%)	31 (48%)	*P*=.000
Education				
<HS graduate	104 (26%)	26 (27%)	25 (39%)	χ^2=9.50
HS graduate	186 (46%)	48 (50%)	32 (49%)	*P*=.05
College graduate	114 (28%)	22 (23%)	8 (12%)	
Income				
<$7000	62 (16%)	41 (43%)	39 (60%)	χ^2=87.07
$7000–15000	126 (31%)	27 (28%)	18 (28%)	*P*=.000
$15000–$25000	142 (35%)	16 (17%)	5 (8%)	
$25000+	74 (18%)	12 (12%)	3 (4%)	
Mean (SD) father's occupational prestige	41.31 (14.21)	42.61 (14.92)	36.93 (12.23)	*F*=3.04 *P*<.049
Mean (SD) age	39.17 (12.51)	37.04 (12.16)	34.23 (12.66)	*F*=4.93 *P*=.008

Note: percentages and standard errors are in parentheses for categorical and continuous variables, respectively.

same New York City community. Eligibility for the patient sample was determined by age (19–59 years old) and whether a recent datable episode of psychiatric disorder could be established. The patient sample was also reinterviewed for the "risk-factor study" which focused on schizophrenia and depression. The psychiatric patient group included 96 patients with unipolar depression and 65 patients with nonorganic, nonaffective psychotic disorders. The data reported in the present study is based on the most recent set of interviews.

Description of the Study Sample

The study sample consisted of 404 community residents, 96 patients with major depression, and 65 patients with nonorganic, nonaffective psychotic disorder (mainly DSM III schizophrenia), which will be called "schizophrenia-like" disorders. Sociodemographic characteristics of the community and patient samples are reported in Table 1. The ethnic/racial distribution across community and patient samples was not significantly different. For both samples, the Latino respondents were predominantly Puerto Rican. The gender breakdown was significantly different with substantially more females in the depressed group. The 3 groups also differed significantly in terms of their marital status with a higher proportion of married individuals in the community sample and more unmarried or divorced persons in the schizophrenia-like disorders group. Socioeconomic disadvantage was also evident for the schizophrenia-like disorders group relative to depressed and noncase community respondents as reflected by level of education, income, and father's occupational prestige. The schizophrenia-like disorder patients were significantly younger, on the average, than community respondents.

Measures

Dependent Measures

The DST, PHO, and FBP scales of the PERI[22] are employed as measures of a range of paranoia symptoms from subclinical to pathological types, respectively. These 3 scales have adequate internal reliability with Cronbach's alphas ranging from .72 to .85. The DST is not highly correlated with the FBP or PHO, but the latter 2 are moderately correlated with each other.[20,22,24,25] The content of the 5-item DST scale describes subclinical paranoia, and the 13 items of the FBP indicate pathological paranoia. The 5-item scale of PHO can represent either subclinical or pathological paranoia. Dohrenwend et al[22] provide a more detailed description of these scales.

All of the PERI scales have a 5-point response format. The DST scale response format is "strongly agree" (0), "somewhat agree" (1), "neither agree or disagree" (2), "somewhat disagree" (3), "strongly disagree" (4). The response format of the scales of PHO and FBP is "never" (0), "almost never" (1), "sometimes" (2), "fairly often" (3), "very often" (4). All of the scales are scored by dividing the sum of the item scores by the number of items yielding a range of scores from 0–4.

Independent Measures

Sociodemographic variables selected on the basis of the comparisons reported in Table 1 serve as predictor variables in the multivariate analyses. Ethnic/racial status and diagnoses are the fixed effects in the models with the other sociodemographic characteristics and social desirability serving as covariates. The psychiatric diagnoses for the patient sample were obtained via clinical interviews under close supervision.[57] Although unstructured interviews were used, these diagnoses are considered research diagnoses because of the rigorous supervi-

Table 2. Unadjusted and adjusted mean scores on the scales of DST, PHO, and FBP by ethnicity/race and diagnostic subgroup

Level of Paranoia	White	Black	Latino
		Community Sample	
FBP	0.26 (.28)	0.33 (.32)	0.44 (.42)
PHO	0.79 (.79)	0.94 (.94)	1.05 (1.04)
DST	1.50 (1.50)	1.70 (1.72)	1.75 (1.73)
		Depressed Patients	
FBP	0.55 (.75)	0.94 (.90)	1.15 (1.12)
PHO	1.30 (1.53)	1.68 (1.58)	1.67 (1.65)
DST	1.85 (1.96)	2.47 (2.42)	2.21 (2.19)
		Schizophrenic Patients	
FBP	1.19 (1.17)	1.38 (1.27)	1.41 (1.24)
PHO	1.55 (1.53)	1.76 (1.66)	1.91 (1.77)
DST	1.84 (1.82)	1.92 (1.88)	1.81 (1.73)

Note: adjusted means are in the parentheses. FBP = false beliefs and perceptions; PHO = perceived hostility of others; DST = distrust.

sion that ensured the use of the multiaxial procedure and corrections for misclassification or improper use of DSM-III criteria.[57] In addition, the Crowne-Marlowe scale[58] was used to control for social desirability of responses.

RESULTS

Separate repeated-measures analyses of variance (ANOVA) were conducted for the community sample and the patient sample with paranoid symptom expression, as measured by the PERI scales, as the outcome measure. A mixed model 3 (Level of Paranoia) × 3 (Ethnicity/Race) ANOVA was conducted for the community sample. A 3 (Level of Paranoia) × 3 (Ethnicity/Race) × 2 (Diagnosis) ANOVA was conducted for the patient sample. The PERI scales of DST, PHO, and FBP representing different levels of paranoia served as a within-subjects variable, and ethnicity and diagnosis were between-subjects variables. Adjusted models controlled for ethnic/racial differences in age, sex, education, income, father's occupational prestige, marital status, and social desirability. Hypothesis-testing involved 2 approaches: 1) standard significant tests of mean differences between groups; and 2) an analysis of the patterns of mean scores across the paranoia scales by ethnic/racial group and diagnostic category.

Hypothesized patterns of mean scores across the paranoia scales, based on the 4 different models of ethnic/racial differences in psychiatric disorders (see Appendix), were compared by use of contrast analysis. Contrast weights corresponding to the predictions for each model were analyzed using the adjusted means by Traditional Contrast Analysis (TCA)[59,60] and Predicted Pattern Testing (PPT).[61] Means and adjusted means for the scores on the DST, PHO, and FBP scales are presented by ethnicity/race for the community and patient samples in Table 2.

To test for overlap in the models, the contrast weights associated with the patterns predicted by each model on the PERI scales for the patient sample were regressed on the actual adjusted means scores in Table 2 controlling for the influence of the remaining models. The overall regression model was significant, $R^2=.82$, $F_{(4,13)}=15.02$, $P<.0001$, but only the sociocultural model, $t=6.15$, $P<.0001$, and clinician bias model, $t=2.33$, $P<.05$, were significant predictors. These results suggest that the clinician bias model is relatively weak and that the self-selection and social selection models overlap considerably with the sociocultural model in the current design. The use of research diagnoses limits the test of the clinician bias model, but it can be reconceptualized as the null hypothesis because of adherence to diagnostic criteria.[20,62]

Table 3. The analysis of variance results for the community sample

Source	SS	*df*	MS	F	*P*
Fixed effects					
Level of paranoia	13.69	2	6.84	22.13	.000
Ethnicity/race	6.30	2	3.15	4.31	.014
Level of paranoia × ethnicity/race	1.04	4	0.26	0.84	.499
Covariates					
Age	4.32	1	4.32	5.91	.016
Sex	5.37	1	5.37	7.34	.007
Education	12.91	1	12.91	17.67	.000
Income	0.96	1	0.96	1.31	.254
Father's occupational prestige	0.03	1	0.03	0.04	.849
Marital status	0.05	1	0.05	0.07	.797
Social desirability	18.90	1	18.90	25.87	.000
Error*	287.91	394	0.73		

* The between-subjects error term is used.

Between-Group Mean Differences

Community Sample

The ANOVA results for the community sample are presented in Table 3. As depicted in Table 3, significant main

effects for both level of paranoia and ethnicity/race were evident. Post-hoc tests of mean differences indicate that Latinos score significantly higher than Whites on all the PERI scales and Blacks, falling in between the 2 groups, are not significantly different from either of them. Support for the hypothesis that the scales of DST, PHO, and FBP form a continuum of severity is also evident. The lowest mean scores were on the scale of FBP (Mn=.34) followed by PHO (Mn=.89) then DST (Mn=1.63) reflecting decreasing severity and greater frequency across the different measures of paranoia.

Patient Sample

Table 4 presents the ANOVA results for the patient sample with paranoid symptom expression, as reflected in the PERI scales, as the outcome. Table 4 reveals a significant main effect for the level of paranoia and a level of paranoia by diagnosis interaction. Figure 1 depicts patients' scores on the scales of DST, PHO, and FBP by diagnostic group. As reflected in Figure 1, depressed patients have higher scores than schizophrenic patients on the scale of DST, while the latter group scored higher on the scales of PHO and FBP. The differential associations among types of paranoia and diagnostic subgroups are consistent with the conceptualization of paranoia along a continuum of severity.

Table 4. The analysis of variance results for the patient sample

Source	SS	*df*	MS	F	*P*
Fixed effects					
Level of paranoia	3.95	2	1.97	4.13	.017
Ethnicity/race	1.77	2	0.89	0.65	.526
Diagnosis	0.00	1	0.00	0.00	.992
Paranoia × ethnicity	1.33	4	0.33	0.69	.597
Paranoia × diagnosis	7.93	2	3.97	8.30	.000
Ethnicity × diagnosis	0.53	2	0.26	0.19	.826
Paranoia × ethnicity × diagnosis	1.38	4	0.35	0.72	.576
Covariates					
Age	5.72	1	5.72	4.17	.043
Sex	0.37	1	0.37	0.27	.604
Education	16.09	1	16.09	11.72	.001
Income	4.28	1	4.28	3.12	.080
Father's occupational prestige	0.21	1	0.21	0.15	.700
Marital status	0.19	1	0.19	0.14	.710
Social desirability	11.12	1	11.12	8.10	.005
Error*	203.21	148	1.37		

* The between-subjects error term is used.

Analysis of Patterns of Mean Scores

Community Sample

For the community sample, contrast weights ranged from −4 to +4 in the test of the sociocultural model and −1 to +1 in the test of one alternative model. Self-selection, social selection, and clinician bias models all share the prediction of no difference by ethnicity/race, so only variation due to paranoia scale is tested in the alternative model. The weighting scheme follows the one recommended in TCA.[59,60] The raw contrast weights are transformed into scaled weights for PPT so that the absolute value of their sum equals 2.[61] The contrast weights are assigned according to the expected value for a given cell from the table of mean scores (see Appendix). The actual tests of significance associated with these analyses are focused ANOVAs with *df*=1 in the numerator.[59–61] Both procedures provide methods for computing sum of squares (SS) for a given pattern of mean scores and $SS_{\text{between conditions}}$.

The F statistic is computed by dividing the mean square, which is equal to the SS with *df*=1, by the mean square error (MSE) from the original ANOVA model in Table 3 for the community sample and Table 4 for the pa-

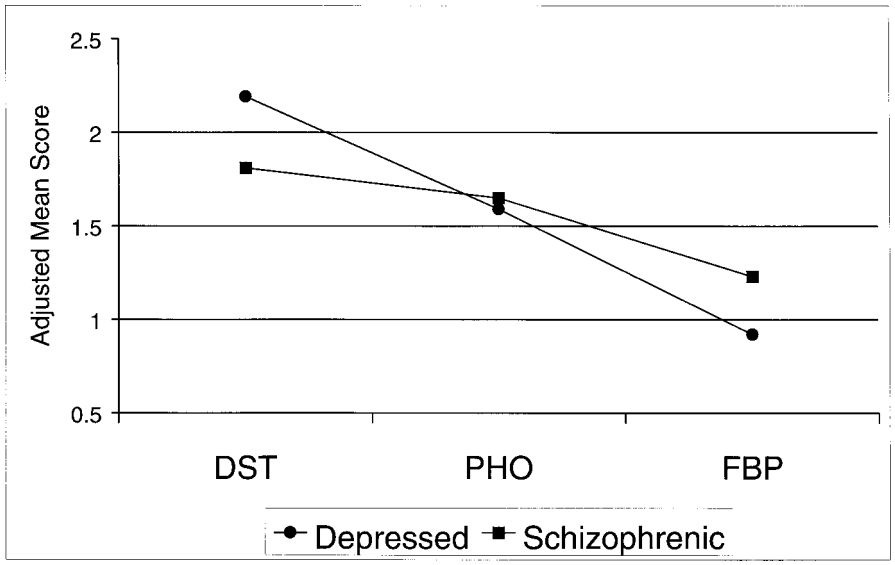

Fig 1. Adjusted mean scores on the scales of Distrust (DST), Perceived Hostility of Others (PHO), and False Beliefs and Perceptions (FBP) for depressed and schizophrenia-like disorders patients

tient sample. For nonorthogonal models, Rosenthal and Rosnow[60] recommended that the proportion of the between conditions variance explained by each model or R^2, calculated by dividing the SS for the models by the $SS_{\text{between conditions}}$, be used to compare the models. Because of unequal *N*s in each cell, the harmonic mean of 116.7 for the community sample and 17.12 for the patient sample are used in computations requiring sample sizes per condition.

Traditional Contrast Analysis (TCA) and PPT yield very similar results. For example, $SS_{\text{between conditions}}=305.09$ and 304.59 for the community sample with TCA and PPT, respectively. The results from PPT are chosen over those from TCA for presentation, because PPT has "features that are responsive to Type I error and power concerns about both the predicted pattern and nontrivial departures from it."[61] Both the sociocultural model, $R^2=.97$, F (1, 358)= 395.51, $P<.00001$, and the symptom severity model, $R^2=.95$, F (1, 358)= 389.58, $P<.00001$, are strong predictors of the pattern of mean scores on the PERI paranoia scales. The comparable results may be attributable to the strong pattern of scores related to the continuum of severity of paranoia which is included in both models. To test this assumption, another model is used which varies ethnicity/race but holds severity of paranoid symptoms constant. This final model explains less variance than the other 2, $R^2=.03$, F (1, 358)=12.45, $P<.0001$, but is still very significant. Thus ethnic/racial background and the continuum of severity reflected in the differences between the scales of DST, PHO, and FBP both contribute to paranoid symptom expression in the community sample.

Patient Sample

Predicted Pattern Testing (PPT) reveals a different set of results for the 4 models of psychiatric disorder in the patient sample. The raw contrast weights ranged from −17 to +17 in increments of 2 as recommended by Rosenthal and Rosnow.[60] The weights are applied to each cell of the 3 (Level of Paranoia) × 3 (Ethnicity/Race) × 2 (Diagnosis) table according to the values predicted by the corresponding model (see Appendix). In other words, −17 is always assigned to the cell with a value of 1 and +17 to the cell with the value of 18. The raw contrast weights are transformed into scaled weights for PPT so that the absolute value of their sum equals 2.[61] A summary of the results of the PPT including the departures test for the patient sample is presented in Table 5. Table 5 indicates that the sociocultural model is superior to the remaining models of ethnic/racial differences in psychiatric disorders.

Table 5. Predicted pattern testing of contrast weights for models of ethnic/racial differences in psychiatric disorders

	F Test			
Model	**SS**	**PPT**	**Departure**	R^2
Sociocultural	44.17	35.03*	1.02	.68
Self-selection	18.50	14.67*	2.29†	.29
Social selection	15.90	12.61*	2.42†	.25
Clinician bias	8.83	7.00‡	2.77*	.14

* $P<.001$.
† $P<.005$.
‡ $P<.01$.

Regression analysis of the contrast weights for the models indicated that the sociocultural, self-selection, and social selection models are nonorthogonal. In this cross-sectional study, substantial overlap of the sociocultural model with the self-selection and social selection models was evident. However, Table 5 revealed that systematic departures from the predicted pattern contrast are not statistically significant for the sociocultural model, but are significant for departure tests from the models of self-selection, social selection, and clinician bias. The evidence supports a predicted pattern that is considerably weaker when the PPT and departure test are both statistically significant.[61] The proportion of between conditions variance is much greater for the sociocultural model compared to the remaining 3 models (see Table 5). These findings converge with the regression analysis of the contrast weights. Taken together, these various results favor the sociocultural model of ethnic/racial differences in psychiatric disorders.

DISCUSSION

Two analytic approaches were used to test 4 alternative hypotheses. The initial method used multivariate tests to examine mean differences on self-reported psychiatric symptoms as a function of severity of paranoia (ie, the scales of DST, PHO, and FBP), ethnicity/race and diagnostic subgroup. The second approach analyzed predicted pattern contrasts by ethnicity/race and diagnostic subgroup with actual mean scores, adjusted for sociodemographic variables and social desirability, on the PERI paranoia scales for each of the 4 hypothesized models. The results of the 2 methods of analysis add to the empirical literature supporting the hypothesis that the scales of DST, PHO, and FBP form a continuum of severity.[20,24,25] Symptoms of distrust are more prevalent than perceptions of hostility which, in turn, are more frequent than unusual beliefs. Differential prevalence estimates for the various levels of paranoia suggest that they represent different degrees of severity of psychopathology. One implication of these findings is that paranoia is best conceptualized as a continuum instead

of a dichotomy in assessments of psychopathology. Strauss[63] also concluded that conceptualization of delusions as dichotomous was inadequate, after he found that 50% of the delusions in a sample of 119 psychiatric patients could not be classified simply as "present" or "absent."

Significance Testing of Between-Group Mean Differences

Multivariate tests of mean differences on the paranoia scales also revealed a significant ethnicity/race main effect in the community sample. The significant main effects on the scales of DST, PHO, and FBP are consistent with the sociocultural model of ethnic/racial differences in psychiatric disorders. Latino respondents scored significantly higher than White respondents with Blacks falling in the middle but not significantly different from either group. The finding that Black and Latino individuals score higher than Whites on these scales is consistent with the sociocultural hypothesis that their experiences of social disadvantage, racism, and cultural oppression make them more vulnerable to paranoid conditions.[13,20,30,35–37,50] The alternative model based on symptom severity was also significant in the community sample. The level of paranoia by ethnicity/race interaction was not significant. These results suggest that sociocultural factors and symptom severity make independent contributions to paranoid symptom expression in the community sample.

Although there were no significant effects involving ethnicity/race in multivariate tests of the patient sample, the sociocultural model of ethnic/racial differences in psychiatric disorders received the strongest support. The level of paranoia main effect in the patient sample was qualified by a significant level of paranoia by diagnosis interaction in the multivariate test. Depressed patients scored higher on the scale of DST than schizophrenic patients, while the opposite was true for the scales of PHO and FBP. These results are consistent with the argument that, in some instances, paranoia may be associated with depression.[15–20,38] Using research diagnoses, Whaley[20] found that high levels of distrust were associated with a greater risk of depression in Black patients in contrast to their White counterparts. These findings are consistent with arguments presented by Ridley[13] and Zigler and Glick[17] that paranoia at the mild end of the continuum is less likely to reflect a schizophrenic disorder, especially among African Americans. These above findings are also at odds with the view that the scale of PHO is similar to the scale of DST.[22] Whaley[24] found that the scale of PHO may be phenomenologically different depending on the type of sample. The scale of PHO may represent more severe psychopathology in a patient sample than in a community sample. This assumption can be tested in future studies.

Contrast Analysis of the Differences in Patterns of Mean Scores

Contrast analyses using PPT revealed a significant effect for the sociocultural model and its alternative model in the community sample. The sociocultural model is the focus of the test because it is only model with a unique predicted pattern of ethnic/racial differences for the community sample. According to Levin and Neuman,[61] when the predicted pattern and systematic departures from it are both significant, researchers can claim only partial support for the theoretical model. These results indicate partial support for the sociocultural model in the community sample. However, the results of contrast analyses of ethnic/racial differences in the community sample controlling for symptom severity also yielded a significant effect. Thus the PPT results confirm the findings of the multivariate tests by also suggesting that both sociocultural factors and severity of psychiatric symptoms play a significant role in paranoid symptom expression in the community sample.

Contrast analyses of the sociocultural model using PPT yielded the largest effect in size and the weakest outcome for tests of systematic departures from the predicted pattern relative to self-selection, social selection, and clinician bias models. Analyses of the patterns of mean scores suggested that the sociocultural model is unequivocally the best account of ethnic/racial differences in psychiatric disorder in the treated sample. The self-selection and social selection models received partial support probably due to their overlap with the sociocultural model. As expected, the weakest support was found for the clinician bias model which is attributable to the use of research diagnoses in this study.

Significance Testing versus Contrast Analysis

The discrepancy between results from multivariate significance testing and pattern analyses in hypothesis-testing for the patient sample underscores the need for approaches that consider effects which are theoretically meaningful but small or nonsignificant.[59–61,64] The disparate results also add to the growing concern about the overreliance on null hypothesis testing in clinical research.[62] Lack of significant ethnic/racial effects in the multivariate tests suggests that there is no ethnic/racial difference or cultural bias associated with psychiatric diagnoses. Indeed the research literature challenges this assertion with numerous studies showing ethnic/racial biases in diagnostic patterns.[3,12–14,20,27,28,40,43,46–50,54,55] Failure of the current study to find ethnic/racial effects in the patient sample with significance testing is an anomaly in the broad context of past research on sociocultural differences in psychiatric disorders. Malgady[62] discussed null hypothesis testing in relation to the question of cultural bias in assessment and diagnosis of ethnic/racial minority cli-

ents: the null hypothesis is that there are no ethnic/racial differences or cultural biases, while the alternative hypothesis is that there are ethnic/racial differences or cultural biases. Malgady pointed out that in the context of mental health services to ethnic/racial minority individuals rejection of a true null hypothesis (Type I error) would lead to unwarranted changes in the mental health system, but retention of a false null hypothesis (Type II error) would lead to misdiagnosis and inappropriate treatment for members of ethnic/racial minority groups. Malgady[62] concluded that a Type II error has more dire consequences than a Type I error. His conclusion joins with other arguments urging diminished importance on our lack of significant ethnic/racial effects in multivariate tests of significance. Besides, statistical techniques such as TCA and PPT are useful adjuncts to traditional significance testing, because these procedures provide other ways of deciding whether between-group differences are valid. In the current study, PPT yielded a pattern of outcomes that were not only conceptually coherent, but also consistent with the strengths and weaknesses of the research design.

Strong support from PPT for the sociocultural explanation of the bias associated with ethnic/racial differences in psychiatric disorders in treated samples suggests that the disadvantaged social status of minority groups increases the likelihood that interpersonal and social aspects of "paranoia" may in fact reflect their actual experiences. One major implication of the findings from this study is that eliminating bias in psychiatric diagnoses requires training clinicians to be sensitive to, and understanding of, cultural differences so that they can distinguish cultural from pathological aspects of paranoia. This assertion presupposes that clinicians are rigorously trained in the application of diagnostic criteria. If this is not the case, then increasing the rigor in clinicians' ability to utilize diagnostic criteria is a necessary precursor to cultural sensitivity training to adequately address the issue of bias.[20] The current study design exemplifies this recommendation. Regression analyses in the current study suggested that clinician bias occurs independently of cultural biases; both must be dealt with to improve psychiatric diagnoses. The use of research diagnoses undermined the test of the clinician bias model, so its relative contribution to ethnic/racial differences in psychiatric disorders could not be effectively gauged.

Of particular note, the sociocultural model received strong support in the patient sample and only partial support in the community sample using PPT, while the significance testing of mean difference yielded the opposite effect. Differential results in community and psychiatric patient samples are not uncommon in epidemiological research. Several studies have found structured clinical interviews, which are reliable in patient samples, to show poor reliability in community samples.[65,66] Similarly, it has been demonstrated that the assumed correlation between psychiatric symptoms and psychosocial functioning is valid for patient samples but not community samples.[67] These 2 explanations can be applied to the current discrepancy between patient and community samples. The explanation, however, that differences in reliability are responsible for the disparate outcomes is very unlikely. Ample evidence is available suggesting that the PERI paranoia scales are equally reliable in community and patient samples.[22,24] The greater covariation of the different dimensions of paranoia in the patient sample than the community sample is a more plausible explanation. Because different types of paranoid symptoms have a lower probability of occuring together in the general population, a greater differentiation among them will be evident in a community sample. Moreover, individual differences in paranoid symptom expression will reflect greater variability, because of the lower probability of co-occurence, than other personal characteristics. For instance, ethnic/racial background also has 3 categories, but since they are mutually exclusive more homogeneity is evident across categories; this would also explain why there is a significant main effect for ethnicity/race in the community sample from significance testing, but not the patient sample. The higher degree of covariation of symptoms is likely to make patients from different ethnic/racial groups more similar than they are in the general population. This issue deserves more attention in future research.

LIMITATIONS OF THE CURRENT RESEARCH DESIGN

The current design has some limitations that should be acknowledged. First, this study employs research diagnoses. The use of research diagnoses instead of standard diagnoses, which tend to avoid the problems of standard clinical diagnoses involving misuse of DSM criteria, undermines our test of the clinician bias model. The clinician bias model assumes that lack of adherence to diagnostic criteria is the reason for diagnostic error. The patient sample was developed by carefully supervised diagnoses for research purposes.[57] The clinician bias model of ethnic/racial differences can only be tested as a null hypothesis when research diagnoses are used.[20,62] Adequate testing of the clinician bias perspective is limited under these conditions. Nevertheless, research diagnoses are more preferable to standard clinical diagnoses, unless both types are available and can be compared, because they avoid the confounding of measurement issues with theoretical predictions.

Another problem is the cross-sectional design of the current data. An adequate test of either the self-selection or social selection models requires longitudinal data. These 2 models overlap

with the sociocultural model, probably because self-referral behavior and the social behavior of others toward ethnic/racial minority groups are culturally determined. The variance that the sociocultural model shares with the self-selection and social selection models may be inflated in a cross-sectional design. However, one analysis was a simultaneous comparison of the predictions from all 4 models to determine whether the different models can explain unique variance in this cross-sectional study.

Another point to be made is that research diagnoses may underestimate ethnic/racial differences in psychiatric disorders in general. Replication of this study with both standard clinical diagnoses and research diagnoses would allow for a more complete analysis of biases. Study participants were recruited from the Washington Heights community of New York City, so regional differences in psychiatric practices and rates of disorder may also compromise the external validity of the findings. Finally, the current study focused on one particular psychiatric symptom. Other psychiatric symptoms should be studied to broaden the scope of research on cultural variations in psychiatric disorders. The choice of symptoms should be based on evidence that there is cultural variation, or they should be selected if they can be empirically or theoretically linked to ethnic/racial differences in psychiatric disorders. Expansion of the current approach to other symptoms is the next logical step in the quest for a better understanding of ethnic/racial differences in psychiatric disorders.

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Manuscript draft: Whaley, Geller
Statistical expertise: Whaley
Acquisition of funding: Whaley
Administrative, technical, or material assistance: Baker, Geller
Supervision: Whaley

Appendix. Predicted patterns of mean scores on the PERI paranoia scales by ethnicity/race for community and patient samples

COMMUNITY SAMPLE

	Sociocultural			Self-Selection, Social Selection, and Clinician Bias		
	White	**Black**	**Latino**	**White**	**Black**	**Latino**
FBP	1	2	3	1	1	1
PHO	4	5	6	2	2	2
DST	7	8	9	3	3	3

PATIENT SAMPLE

1. Sociocultural

	Depressed			Schizophrenic		
	White	**Black**	**Latino**	**White**	**Black**	**Latino**
FBP	1	2	3	4	5	6
PHO	7	8	9	10	11	12
DST	13	14	15	16	17	18

2. Self-Selection

	Depressed			Schizophrenic		
	White	**Black**	**Latino**	**White**	**Black**	**Latino**
FBP	1	2	3	10	11	12
PHO	4	5	6	13	14	15
DST	7	8	9	16	17	18

3. Social Selection

	Depressed			Schizophrenic		
	White	**Black**	**Latino**	**White**	**Black**	**Latino**
FBP	3	2	1	12	11	10
PHO	6	5	4	15	14	13
DST	9	8	7	18	17	16

4. Clinician Bias

	Depressed			Schizophrenic		
	White	**Black**	**Latino**	**White**	**Black**	**Latino**
FBP	1	4	7	16	13	10
PHO	2	5	8	17	14	11
DST	3	6	9	18	15	12