



Racial Differences in Auditory Hallucination Content and Attitudes: An Advancement in Cultural Psychiatry and Clinical Application of Social Determinants of Health

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ABSTRACT

Background: Minimal prior literature compares the hallucinatory experiences of individuals from different racial backgrounds living within the same geographic area. Understanding differences of hallucinatory content and attitudes is essential to tailoring clinical advice for patients. We aim to investigate the differences in hallucinatory content and attitudes toward hallucinations for individuals of different races receiving care from the same academic institution. **Methods:** Cross-sectional study using an institutional database, randomly selected patient charts from 2008-2020. Inclusion criteria: age 10+ years, primary psychotic disorder, known race, documented auditory hallucination content. Excluded patients with hallucinations of non-psychiatric origin. Racial cohorts White, Black, Hispanic, and Asian each had n=50. Due to database limitations, Native American/Alaska Natives had n=8, Native Hawaiian/Pacific Islander had n=7. Hallucination content and perception of symptoms (positive or negative) compared between cohorts using chi-square test of independence and multinomial regression. **Findings:** Blacks had the most hallucinations of violence, including police violence, and racism. Native Hawaiian/Pacific Islanders were most likely to have hallucinations of nature and medical violence. Hispanics had the most religious hallucinations. Asians had more derogatory hallucinations. Whites had more hallucinations of government violence. Native Hawaiians/Pacific Islanders were most likely to have a positive attitude towards hallucinations (positive: negative 3:4). Whites were least likely (positive: negative 1:11). **Interpretation:** Patients from different racial backgrounds in one geographic area experience auditory hallucinations differently. Appreciating these differences may improve trauma-informed care and cultural humility.

INTRODUCTION

Hallucination is one of the hallmark symptoms of psychosis. While hallucinations are well-studied in patients with psychotic disorders, differentiation of hallucination topics by patient characteristics is limited. Most studies differentiate cohorts on the basis of participants' trauma history, sex, or age (1,2,3). A few examined hallucination qualities by race (4,5,6,7,8,9,10). Of those studies, most described variations in hallucinatory content by geographic location, separating cohorts by country of residence (4,5,6,7,8). The few studying hallucinations by race in one geographical region only investigated frequency (10) or modality (auditory versus visual) (9). Additionally, literature relating to differences in patients' attitudes toward their hallucinations as positive or negative is limited to a handful of studies comparing between countries (4,5,6,7,8). There is minimal research comparing attitudes toward hallucinations and hallucination content for multiple races within one geographic area.

Life experiences such as traumas can inform the content of hallucinations (11,12). While not genetically discrete groupings (13), race nonetheless produces meaningful differences in the life experiences of humans based on clusters of phenotypic, geographic, and ethnic factors. Though not genetic, race does have a biologic impact due to racial biases in social determinants of health (14). Since there are differences in the distribution of traumas and other salient life experiences that can impact hallucinations, we hypothesized there would be differences in hallucination content between racial cohorts.

Furthermore, prior literature demonstrates differences in the attitudes of patients from different countries toward their hallucinations (4,5,6,7,8). We hypothesized that as a limited proxy for cultural background, racial groupings would likewise correspond to patients' attitudes towards hallucinations. We investigated the differences in content and attitudes between races for patients who all received care at the same major American academic medical center.

METHODS

Subject Selection

The patient cohort was aggregated using an integrated database at a major academic hospital in California. Inclusion criteria was: age 10+, primary psychotic disorder diagnosis with International Classification of Disease (ICD) codes F20-29 (schizophrenia, schizotypal, delusional, and other non-mood psychotic disorders), documentation of race and hallucination content. We excluded participants with hallucinations only with concurrent use of illicit drugs or psychotropic medications, neurologic disorders known to cause psychosis, and other causes of hallucinations besides primary psychotic disorders (e.g., delirium). We aimed for each cohort to have n=50 but due to limitations in the database, Native American/Alaska Native was n=8 and Native Hawaiian/Pacific Islander was n=7. White, Black, Hispanic, and Asian were each n=50. The racial cohort names were taken from the electronic medical record (EMR). We excluded mixed-race participants for simplicity. The study was approved by the Institutional Review Board of the home institution (IRB61: registration # 4947).

Hallucination Content Categories

Hallucination content was divided into four categories: nature, religion, derogatory statements, and violence. These were selected from a conglomeration of categories used by multiple prior studies examining hallucinations content (4,6,15). Content was identified from the medical

record by searching the entirety of each patient's record at the medical center and reading all notes that contained the search terms "hallucination," "AH" (auditory hallucination), "voice," or "voices." A hallucination could fit under multiple categories. For example, if a participant reported hearing the devil say they are useless, that would be categorized under both religious and derogatory statements. The hallucination content of derogatory statements and violence were further subcategorized, with derogatory statements divided into racism, family, and friends; and violence divided into sexual, medical, police, and government. Each subject's hallucination content was categorized by two separate evaluators who were blinded to the race of the subject. Discrepancies between the two evaluators were resolved by adding a third evaluator, with majority vote as the final decision.

Attitudes Toward Hallucinations

Participants' attitudes towards their hallucinations were categorized as positive, neutral, or negative by evaluators looking in the chart for descriptions of how the subject felt about their hallucinations (e.g., "He felt scared of his hallucinations" would be classified as negative). Each subject's attitude was categorized by two separate evaluators who were blinded to the race of the subject. Discrepancies between the two evaluators were resolved by adding a third evaluator, with majority vote as the final decision.

Statistical Analysis

Descriptive statistics are presented as counts and percentages for the categorical variables. Participant demographics were analyzed using chi-square test of independence. Differences in hallucination content and attitudes were analyzed using chi-square test of independence. Results were reported by number of hallucinations, number of hallucinations standardized to an N of 50, and percent of hallucinations from a particular racial cohort (e.g., number of Asian participants with nature hallucination/number of participants who are Asian).

The subcategories were analyzed using multinomial regression, with subcategories as the y-values, and age, gender (based on self-identification), whether or not transgender, and all six racial cohorts at the x-values. The coefficients and p-values were reported. Statistical analyses were completed using RStudio version 1.1.456 with significance level 0.05 (16).

RESULTS

Demographics

There was no statistical difference in gender distribution among the racial cohorts ($p = .469$) (Table 1) except the White cohort, which had significantly more males than females ($p < 0.05$). Cohorts did not have significantly different ages ($p=0.10$).

Table 1: Gender and Average Age of Participants within each Racial Cohort

	<i>Males</i>	<i>Females</i>	<i>Age</i>	<i>Total</i>
Native Hawaiian/Pacific Islander	3	4	30.5	7
Native American/Alaska Native	5	3	41.3	8
Hispanic	26	24	26.1	50
White	39	11	34.6	50
Black	27	23	34.6	50
Asian	24	26	29.6	50

Hallucination Content

Content differs significantly by racial cohort ($p < 0.001$) (Table 2a). Native Hawaiians/Pacific Islanders had more nature hallucinations (Table 2b). Hispanics had more religious hallucination (Table 2b). Blacks had the most hallucinations of violence (Table 2b). The most common hallucination category for all cohorts except Asian was violence (Table 2c). The most common topic for Asians was derogatory statements (Table 2c).

Table 2: Hallucination Content by Racial Cohort

2a: Number of Hallucinations by Categories vs Racial Cohort				
	<i>Nature</i>	<i>Religious</i>	<i>Derogatory</i>	<i>Violence</i>
Native Hawaiian/Pacific Islander	2	1	1	3
Native American/ Alaska Native	2	2	1	3
Hispanic	12	17	15	22
White	7	10	18	25
Black	4	16	21	37
Asian	6	16	22	20
2b: Number of Hallucinations Standardized to N of 50				
	<i>Nature</i>	<i>Religious</i>	<i>Derogatory</i>	<i>Violence</i>
Native Hawaiian/Pacific Islander	14.3	7.14	7.14	21.4
Native American/ Alaska Native	12.5	12.5	6.25	18.75
Hispanic	12	17	15	22
White	7	10	18	25
Black	4	16	21	37
Asian	6	16	22	20
2c: Percent of Hallucinations within each Racial Cohort (%) vs Categories				
	<i>Nature</i>	<i>Religious</i>	<i>Derogatory</i>	<i>Violence</i>
Native Hawaiian/Pacific Islander	28.6	14.3	14.3	42.9
Native American/Alaska Native	25.0	25.0	12.5	37.5
Hispanic	24.0	34.0	30.0	44.0
White	14.0	20.0	36.0	50.0
Black	8.0	32.0	42.0	74.0
Asian	12.0	32.0	44.0	40.0

Subcategories of Hallucination Topic:

For the violence subcategories, there was a statistically significant absence of correlation between age and sexual violence ($p < 0.05$) as well as gender and medical violence ($p < 0.05$). All other violence subcategories and all derogatory subcategories were not significantly related to age, gender, or identifying as transgender (Supplemental Table 1).

Based on a multinomial regression, Blacks were most likely to have derogatory hallucinations involving racism (coeff=4.242) (Figure 1a). Asians were most likely to have derogatory hallucinations involving both family (coeff=1.706) (Figure 1b) and friends (coeff=7.505) (Figure 1c).

Figure 1: Coefficients from Multinomial Regression of Subcategories of Derogatory Hallucinations. For gender, a positive value means female. For transgender, a positive means the participant is transgender.

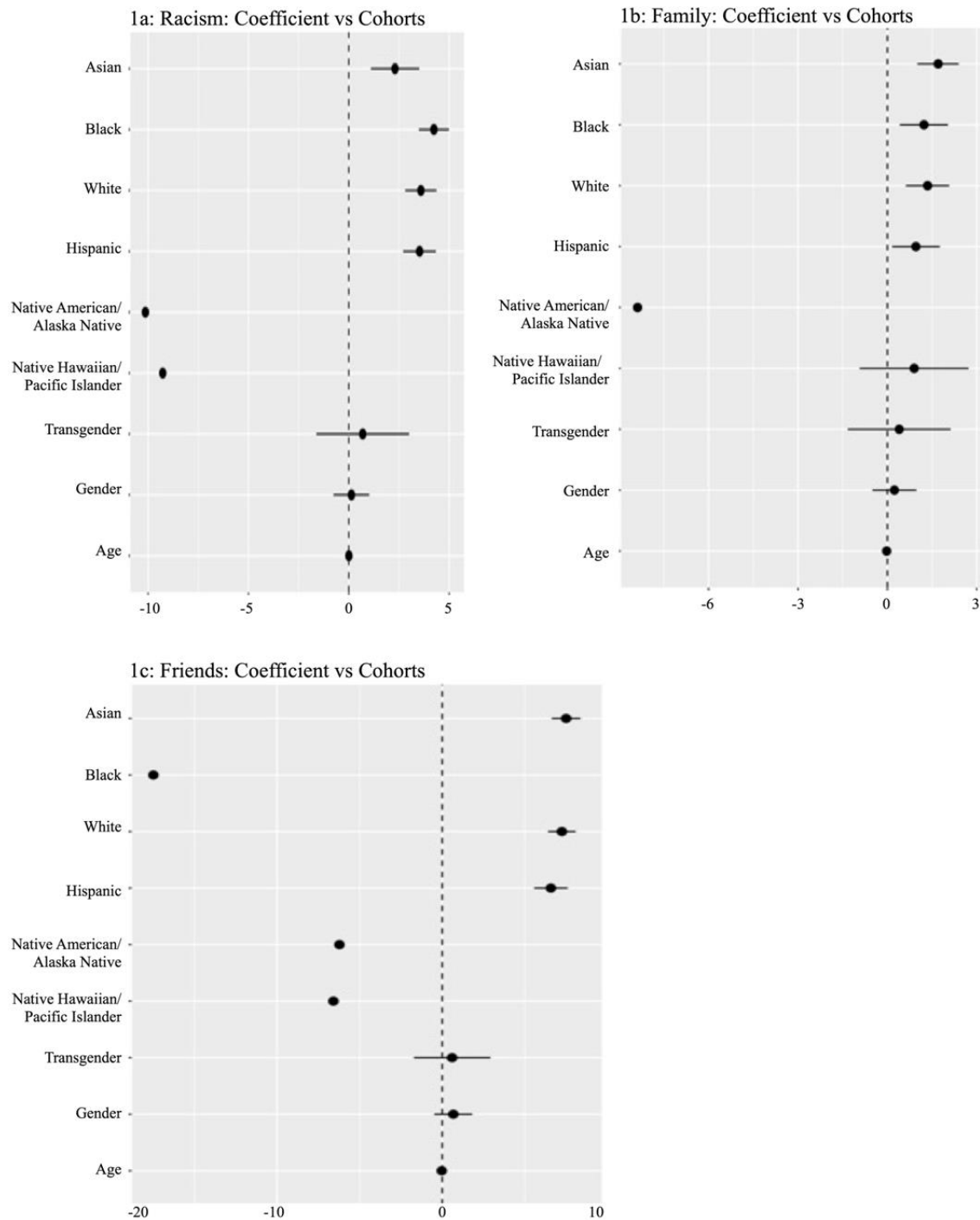


Figure 1: Coefficients from Multinomial Regression of Subcategories of Derogatory Hallucinations.

Whites were most likely to have hallucinations involving sexual violence (coeff=4.167) (Figure 2a) and government violence (coeff=13.101) (Figure 2b); Blacks, police violence (coeff=3.053) (Figure 2c); Native Hawaiians/Pacific Islanders, medical violence (coeff=3.027) (Figure 2d).

Figure 2: Coefficients from Multinomial Regression of Subcategories of Violent Hallucinations. For gender, a positive value means female. For transgender, a positive means the participant is transgender.

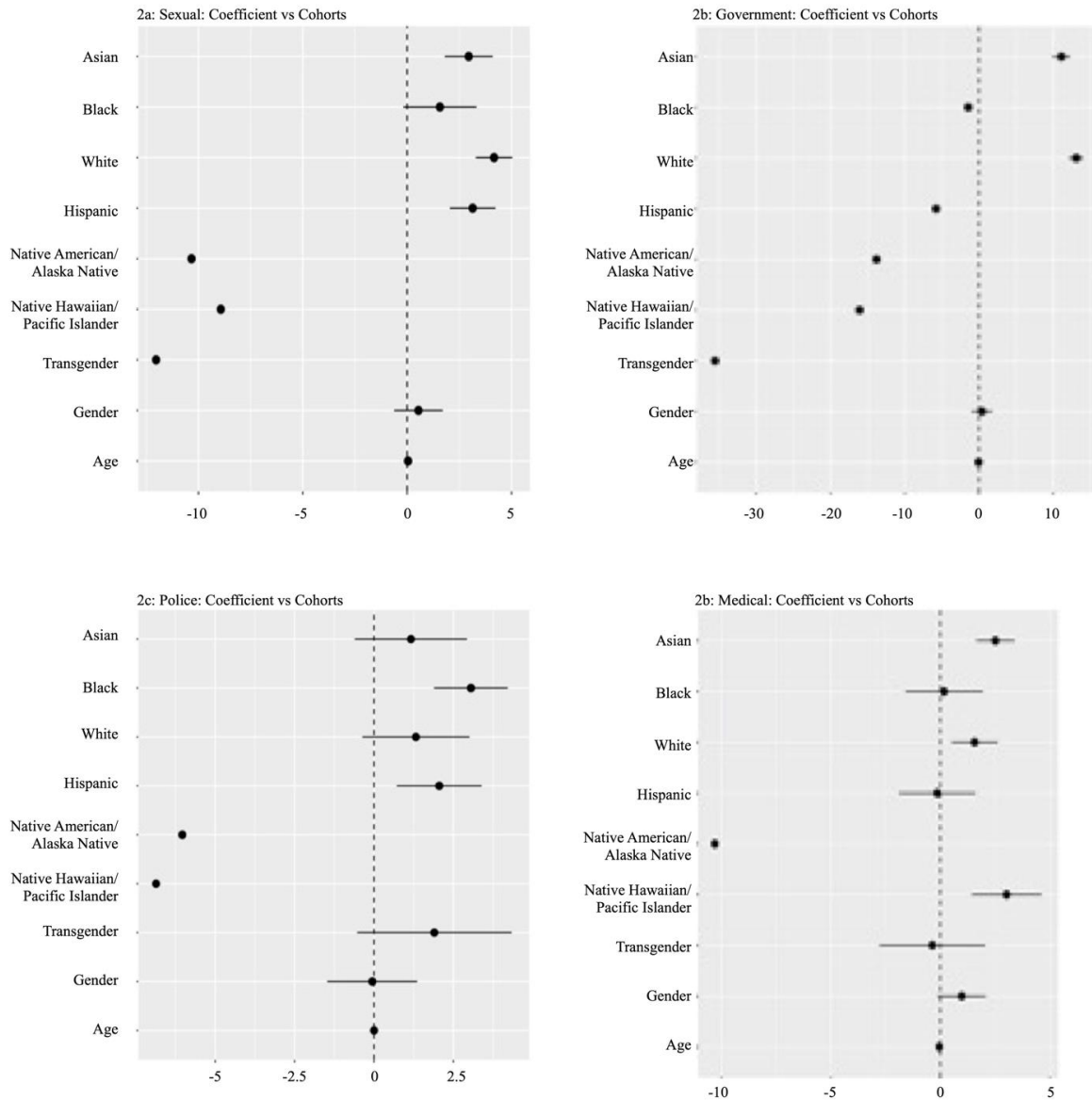


Figure 2: Coefficients from Multinomial Regression of Subcategories of Violent Hallucinations.

Attitudes Toward Hallucinations

Differences in attitudes towards hallucination between racial cohorts were significant ($p < 0.001$). Native Hawaiians/Pacific Islanders had the most positive attitudes towards their hallucinations per capita (positive: negative = 3:4), while Whites had the most negative attitudes (positive: negative = 1:11) (Figure 3).

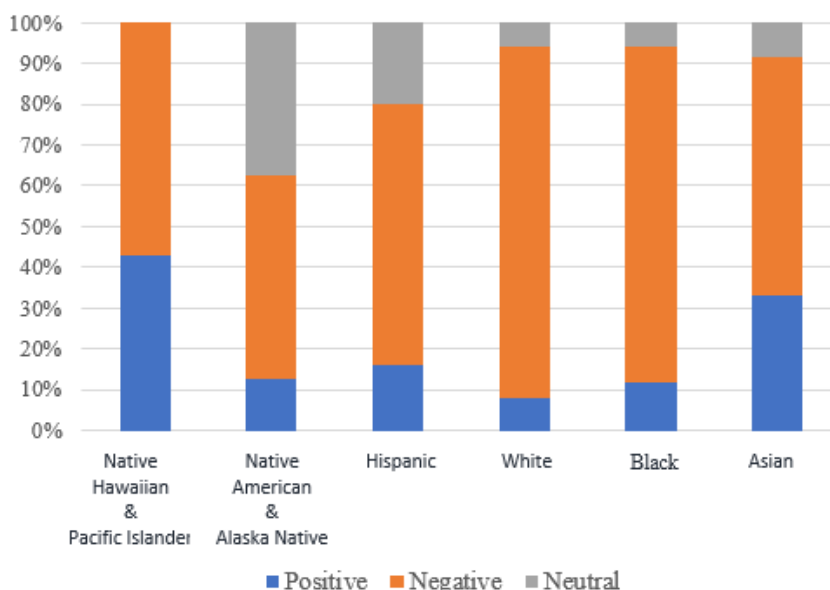


Figure 3: Attitudes toward hallucinations by race

DISCUSSION

Studying racial differences in hallucinations offers one inroad into correcting disparities in mental health outcomes. Hispanics and Blacks tend to have more persistent and disabling mental illness than Whites, and racial minorities are more likely to receive poor care if they are treated at all (17). It is important to explore racial differences in this core diagnostic symptom for primary psychotic disorders to improve detection of hallucination and the relevance of clinical advice so as to provide equitable, trauma-informed care to a diverse population of patients. Cultural humility does not mean abandoning the pursuit of understanding how cultural and race-related factors can contribute to disease presentation and optimal therapeutic approach for patients from diverse backgrounds but rather accepting that competence practicing cross-cultural medicine is a goal we ought to strive for continuously, but can never achieve definitively. Our study is a starting point to understanding the differences between the auditory hallucination experiences of patients of different races.

Black Cohort

In our study, Blacks were most likely to experience hallucinations of violence, with racism as the most common subcategory. They were also more likely to have derogatory hallucinations about racism. Racism is a significant stressor for Black Americans, impacting multiple aspects of health including cognition and mental health (18). This cohort also had the most hallucinations involving police violence. Research shows Blacks are significantly more likely to die by police violence (19). All this to say that racism and police violence are salient stressors for Black Americans. What is unclear is whether only personally experienced past traumas inform future hallucinations (11), or if threats and traumas disproportionately experienced by members of one's community can also influence content. Future research could tease this distinction apart by investigating each participant's hallucination content and personal trauma history then comparing against the types of traumas that disproportionately affect that participant's race.

Hispanic Cohort

Hispanics are second most likely to die by police violence (19) and also second most likely to hallucinate police violence in our study. Hispanics also reported more religious hallucinations, complementing prior evidence that religion influences psychosis content for Hispanics (20, 15). Pew Research Center data from our study's time periods indicates Hispanic Americans are more likely to be religious (21). Literature also indicates that religion impacts health outcomes for this population. Though it may manifest as psychosis content, religion also offers tools for coping with symptoms (15). The relationship between religion and health is not necessarily mediated via negative experiences; often the opposite is true (15,22). We did not specifically investigate whether religious hallucinations were experienced as negative or positive. It is possible that the correlations between clusters of hallucination topics and racial groups may not be mediated solely by disproportionately experienced traumas, but also other differences in values and cultural influences.

White Cohort

Among subcategories of violent hallucinations, Whites had the most hallucinations involving sexual violence. There is surprisingly scant research about sexual violence incidence by race. What literature does exist overall indicates no difference (23). We postulate that sexual violence is terrorizing across races; because many other threats such as racism are less conspicuous for Whites, sexual violence represents a larger proportion. The frequency of sexual violence hallucinations did not differ by gender, despite the fact that women are more likely to be victims of rape and sexual assault compared to men. This supports the idea that hallucination content is not only influenced by personal trauma history but potentially also broader fears. Government control (such as brain chipping) was also a common theme, perhaps related to the high value given to personal autonomy. Prior research found that Whites are more likely than Blacks and Hispanics to experience delusions of grandeur, which scholars interpret as reflecting the emphasis on individualism (20).

Asian Cohort

Among Asians, derogatory hallucinations involving both family and friends were common. This may reflect conflicts between the culture promoted in and outside the home (9). The obligation to honor parents' sacrifices with academic and financial success is a well-described major stressor. Kin relationships and family obligation have deep cultural and social salience, with Asian American adolescents being more likely to prioritize family than social life compared to non-Asians (24). Family relationships and the degree of filial obligation within this cohort has been shown to affect a variety health outcome (25,26). Perhaps Asians experience derogatory hallucinations involving family because trauma becomes distilled into an intergenerational pressure to succeed against all odds.

Native Hawaiian/Pacific Islander Cohort

Native Hawaiians/Pacific Islanders had the most hallucinations involving medical violence, correlating with trauma history. Colonization spread infectious disease, subsequently leading to forced vaccinations and mandatory pre-marital syphilis testing, among other instances of legally-mandated medical procedures without regard to autonomy or traditional medicine (27). Native Hawaiians/Pacific Islanders also had the most nature-themed hallucinations. Nature centers within traditional spiritual and cultural values (27). Moernaut and colleagues posit that there are four steps in the formation of hallucination content: experiences posing

existential quandaries, a related triggering event, confusion, then hearing voices referencing these existential issues (12). Nature may be a culturally salient medium through which to consider existential questions.

Native American/Alaska Native

The Native American/Alaska Native cohort was neither the most common nor least common cohort in any of the topic categories. Within this cohort, like most others, violence was the most common hallucination topic, with nature and religion tying for second. On the multinomial regression, none of the correlations reached statistical significance. This may reflect the cohort being underpowered due lack of adequate individuals identifying as exclusively Native American/Alaska Native in the database---recall that multi-racial people were excluded.

Attitudes Toward Hallucinations

While all cohorts had more negative than positive attitudes, this was especially the case for Whites. The Native Hawaiian/Pacific Islander cohort felt positive more often than others. Prior research has found that Americans viewed hallucinations more negatively than Indians and Ghanaians (8); Nigerians had fewer harassing hallucinations than Britons (7); Indonesians often normalize hallucinations into their lives (6). Our findings complement the literature indicating that people of Western ancestry view their hallucinations more negatively and, furthermore, suggest that geography is not the only factor contributing to differences in the attitudes of people with hallucinations living in Ghana, India, Indonesia, the U.K., and the U.S.

LIMITATIONS

There were more males than females in the White cohort despite randomization during subject selection, which could be due to chance or the result of more males than females being diagnosed with schizophrenia among Whites (28). Nonetheless, this adds potential bias in the results.

Racial cohort names were limited to verbiage directly from the EMR, which is the common practice in prior literature (29). We do not suspect that genetic differences give rise to differences in hallucination content. Rather we are using the charted race as an approximation of broad differences in cultural background and life experience, including social determinants of health (13). We did not collect data about the actual differences in life experiences of the participants. For this reason, our claims about differences in life experience between cohorts are based on outside literature. This limits interpretation of our findings because we do not directly address whether differences in personal trauma history alone are the major driving factor shaping the patterns in our data. Secondly: the terminology used to describe the experiences that befall these groups (e.g., religiosity vs spirituality vs religious attendance vs religious membership) and the cohort names themselves (e.g., Latino vs Hispanic or Asian American vs Asian American/Pacific Islander) are not uniform across the literature.

Races are not neatly defined, discrete genetic entities; the definition of race is socially constructed and intersectional, a conglomerate of factors including superficial phenotypic traits, ethnic and cultural factors, and geographic origin. Ethnic and cultural background relate to race, but are not the same. The integrated database that we utilized considers "Hispanic" to be a race, whereas some categorize Hispanic as an ethnic descriptor rather than a race, for just as there are Americans of many races, so too with Hispanics. The racial cohorts presented in

the database and utilized in this study likely are not distinct entities. This creates difficulty for the interpretation and application of our findings. That being said, this is a limitation that is intrinsic to this field of study due to the necessarily amorphous nature of race. While it is likely that in some ways the specific cohorts that we used in this study are not distinct from one another, they still serve as a useful proxy, as evidenced by our findings that these groupings have significantly different hallucination content.

Another limitation is the small number of Native Hawaiian/Pacific Islander (n=7) and Native American/Alaska Native (n=8) participants. Unfortunately, these were limited by the number in the database. It is possible there are correlations between these racial cohorts and hallucination categories that our study was not adequately powered to detect. Even though the number of participants for these two racial cohorts was low, our study nonetheless adds to the limited pool of literature---indeed, our overall dataset comprised of 215 participants still outnumbers other studies on the subject of hallucination content by race, which totaled less than 50 each (6,8,11).

An area for future research is the role that being cis vs transgender has on hallucinations. Our subject base was poorly powered with n=7 transgender participants and no significant difference was found.

Though the categories of hallucination content in our study may seem very specific (e.g., violence involving police), they emerged from conglomerate categories modeled after prior literature on hallucination content. Perhaps in one setting, women disproportionately experience military personnel violence, just as in our context Blacks disproportionately experience police violence. Extrapolating from our findings: we would expect that women in that hypothetical setting would more often hallucinate violence involving military personnel, just as in our study Blacks more often hallucinate police violence. The specific details may change by social context, but we suspect the overall concept is reproducible and generalizable.

CONCLUSION & CLINICAL SIGNIFICANCE

Our study demonstrating differences in hallucination content by racial cohort is an early step in the development of cultural psychiatry, a nascent field aiming to advance the practice of culturally-conscious, trauma-informed, empathic psychiatry that explicitly takes into account differences in background, life experiences, and intersectional identity when diagnosing and treating psychiatric illness. Given that hallucination content frequently relates to stressors shared within minority groups, exploring this content may assist clinicians in understanding the discrimination their patients face and effectively guiding coping strategies for hallucinations. Difference in attitudes towards hallucinations may also affect patients' responses to proposed treatments, including tolerance of medication side-effects. Someone who strongly views their hallucinations as negative may be more willing to suffer side-effects than someone with a more positive perspective. The therapeutic alliance itself may benefit from cultural humility and curiosity, with consideration that there will be racial differences in the mental burden of hallucinations involving disproportionately distributed stressors and traumas. It would behoove the savvy clinician to undertake to understand not just that their patient is hallucinating, but also the content and emotional response to these hallucinations. A practical clinical approach to managing a patient with pleasant hallucinations of nature sounds is likely different than the approach to treating a patient repeatedly hallucinating the death of

a neighbor at the hands of police. In those instances when hallucinations are experienced as positive, to automatically prescribe medications to eliminate them without first exploring the positive role they play in the patient's life could seriously undermine the therapeutic alliance, reduce medication adherence, and potentially create unmet needs. Investigating the content of hallucinations within a framework indicating that content clusters by race is a starting point to understanding psychosis within a biopsychosocial model. As clinicians we appreciate there is never enough time to devote to each patient. We have observed in clinical practice that there is heterogeneity in clinicians' views toward the utility of soliciting hallucination content. Our findings support the practice. It is a big ask of busy clinicians to include this section in their history-taking. While imperfect, our findings offer a starting point for taking a brief and focused history of hallucination content and patients' feelings about these hallucinations as a step toward closing the racial disparities in mental health.

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