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# Provider-patient communication about adherence to anti-retroviral regimens differs by patient race and ethnicity

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## Introduction

Disparities in quality of care and outcomes for people living with HIV have been found to negatively affect both black [1–4] and Hispanic [5–7] patients. For example, black or Hispanic patients in the United States are more likely than non-Hispanic white patients to report recent non-adherence to anti-retroviral therapy (ART) regimens, even after controlling for other known relevant factors [8–11].

Part of the explanation could be that there are differences in provider-patient communication among patients of different race/ethnicity. However few studies address this question by directly observing clinical encounters. In a study that used the Roter Interactional Analysis System (RIAS) [12–14] investigators found that routine outpatient visits with Hispanic patients living with HIV included less psychosocial talk than visits with white, non-Hispanic patients [15]. Using the same data set and the RIAS, they also observed that black patients talked less than white patients [16]. A previous analysis using the methods used here described ART-related dialogue [17]. However, we have not found any studies that directly examine differences in provider-patient communication about ART adherence by patient race or ethnicity.

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We therefore conducted an exploratory analysis, using the same dataset, to answer the question: does ART adherence dialogue differ by race/ethnicity in HIV care? Because this is a cross-sectional analysis, it is not our intent to infer the direction of causality; that is, whether provider expectations about a particular level of adherence affects or causes a particular type of dialogue or whether a particular type of dialogue affects or causes a particular level of adherence. Rather, we hope to create a rich description of the association that can help generate testable hypotheses that can be examined using longitudinal observational study designs or clinical trials.

## Methods

### Theoretical Framework

The many extant systems for coding and analyzing physician-patient communication have produced a substantial literature [18, 19]. These systems are based on defining various kinds of behaviors, by physicians and patients, and counting their frequencies. They have produced insight into physician and patient role relationships, and have found numerous relationships between features of physician and patient interactions, and outcomes [20–22]. However, the widely used systems have limitations, including lack of a guiding theoretical framework [23], and most important for our purposes, assignment of only a single code to each utterance.

The Generalized Medical Interaction Analysis System (GMIAS) assigns two codes to each utterance. One code captures interaction process based on Speech Act Theory [24–26], a sociolinguistic approach which identifies the social act embodied in an utterance, such as questioning, representing reality, expressing the speaker's inner state, or giving instructions. We provide more detail about speech acts under "coding," below. The unit of analysis in the GMIAS is defined as a completed speech act. The second code assigns utterances to one of a list of topics consistent with the widely used Roter Interactional Analysis System (RIAS) [14, 27] but with greater specificity.

By calculating the proportion of various speech acts in the speech of providers and patients, we can characterize their role relationships and the kinds of resources that are exchanged between the parties. For example, in which direction does information flow? How often do patients express goals or preferences? How often do providers express empathy or reassurance? Who controls the conversation through closed questions? To what extent do physicians give instructions, or conversely ask patients about their preferences? With the addition of topic coding, we can compare these indicators of interaction process among the various subjects that come up during a visit [28].

The GMIAS has been used to characterize interaction processes in physician-patient communication about antiretroviral adherence in the context of an intervention trial [29], to analyze communication about sexual risk behavior [30], to elucidate the association of visit length with constructs of patient-centeredness [31], and to describe provider-patient communication about ART adherence compared with communication about other issues [32]. We give a more detailed description of GMIAS coding below, under "methods."

## Data collection

This is a secondary analysis of data from the Enhancing Communication and HIV Outcomes (ECHO) study, which was designed to assess the role of the patient-provider relationship in explaining racial/ethnic disparities in HIV care. Study subjects were HIV care providers and their patients at four HIV outpatient care sites in separate regions of the United States. The study received IRB approval from each of the sites. Eligible providers were physicians, nurse practitioners, or physician assistants who provided primary care to HIV-infected patients. Eligible patients were HIV-infected; 19 years or older; English-speaking; identified in the medical record as non-Hispanic black, Hispanic, or non-Hispanic white; and had at least one prior visit with their provider.

There were 55 providers eligible for the study across all sites. Overall, 45 (82%) agreed to participate. Two providers actively refused. Eight were not approached because the investigators reached the enrollment target. Across all sites, investigators identified 617 eligible patients. Providers refused to allow 18 patients to be approached for the study, because the provider felt too rushed (n=12), that the patient was too sick (n=5), or the patient was only returning for lab results and not a complete visit (n=1). Of the remaining 599 patients approached, 435 (73%) gave informed consent to participate and completed all study procedures. Research assistants placed a digital audio-recording device in the examination room to record the patient-provider encounter. Following the medical encounter, research assistants administered an interview with patients, which included self-reports of recent ARV adherence. For this analysis, we used the self-report item “About what percentage of the time would you say you take your anti-HIV medications as prescribed?” Finally, research assistants abstracted clinical data including most recent CD4 counts and HIV viral loads from patients’ medical records.

Of the 435 patients who participated, 18 audiotapes were not available for analysis due to recorder malfunction or poor recording quality. In two of the visits, most of the interaction was with a mental health provider, not with the HIV care provider. Despite the original intention, 11 patients gave their race/ethnicity as “other,” or the information was missing. Because this group was small and heterogeneous, we excluded them from this analysis, yielding a sample of 404 patients.

The 45 providers saw a median of 9 patients (range 1–15) in our sample. Each patient is represented by a single visit. In addition to the 45 index providers, many encounters also featured a second provider, a nurse practitioner (NP) or fellow, particularly at one site, which uses a model in which patients are normally first seen by an NP and then by a physician. We call these “complex” visits. There were a total of 36 such complex visits, 30 of them at one site (27 featuring an NP and MD, 3 featuring 2 MDs), with 6 visits at another site featuring a second MD, presumably a fellow plus attending physician. Seventeen visits featured only an NP, with no physician participating. Study procedures have been described in more detail elsewhere [15].

Race/ethnicity was determined by participant self-report as part of the interview described above. Patients responded to two questionnaire items related to race/ethnicity. Consistent with federal standards for race/ethnicity classification, respondents were first asked “What is

your race?" and told they could select more than one category. Response options included White or Caucasian, Black or African American, American Indian or Alaskan Native, and Asian/Pacific Islander or Native Hawaiian. Next they were asked, "Are you Hispanic/Latino" (yes/no). All who answered "yes" to the second question were classified as Hispanic. Analyses used three race/ethnicity categories: non-Hispanic Black, Hispanic, or non-Hispanic White.

## Coding

Audio recordings of visits were transcribed by a professional transcription service or a research assistant, and the resulting transcripts were reviewed for accuracy by another research assistant. Research assistants then coded the transcripts using the GMIAS.

The GMIAS classifies speech acts according to 9 broad categories, with many detailed sub-categories. The top-level categories are interrogatives (various forms of questions); representatives, which make assertions about intersubjective reality; expressives which make assertions about the speaker's beliefs, values, aspirations or preferences; expressions of emotional state; directives, intended to influence the behavior of the other party; commissives, that is promises or offers to take specific actions; social ritual such as greetings; conversation management, such as topic introduction and management of turn-taking; and jokes. Expressions of empathy, which are a form of expressive, are coded separately. In addition to the general categories of speech acts mentioned above, the GMIAS classifies questions as "open," "closed," and "leading," as is commonly used in other systems. Closed questions are answerable with a "yes" or "no," or solicit a narrowly specified fact such as a number or date. Leading questions propose the answer, such as "So we don't need to talk about safe sex, right?" For purposes of this analysis, we combined closed and leading questions. Open questions, such as "What has it been like for you taking your medications?" invite the other party to define the focus of the response. (The GMIAS makes additional kinds of distinctions among questions, which are not used in the analysis here.)

The second GMIAS code labels the topic or subject matter of the utterance. Sub-divisions of the biomedical domain include treatment, symptoms, diagnosis, risk behavior and others. Because we here apply the system to a study of communication about ARV adherence, we included many detailed topic codes in the area of ARV treatment including ARV adherence, side effects unrelated to adherence, and prescribing. Specific strategies to achieve better ARV adherence are coded to a separate topic called adherence problem-solving. General discussion of ARV adherence/non-adherence includes sub-codes denoting various specific reasons for non-adherence. "Prescribing" includes discussion of possible initiation of ARVs in the future, whether or not the patient agrees to it, and change in regimens.

The psychosocial domain includes such issues as substance abuse, recovery, employment, relationships with others, criminal justice involvement, and others. Logistics is dialogue concerning the business of providing medical care such as appointments, referrals, record retrieval, prescription refills unrelated to adherence, and studies and trials. The business of conducting the physical examination is a sub-division of logistics, but we usually treat it separately in analysis. It consists largely of physician directives such as "take a deep

breath." Clinical observations and diagnostic conclusions made in the course of the physical examination are coded to the appropriate biomedical topics. Socializing refers to casual conversation unrelated to the business of the medical visit, and to social rituals, particularly the greeting and parting ritual.

Both topic and speech act codes can have several levels of hierarchy. For example, topic code 6.x is "HIV Antiretrovirals," and within that 6.3 is "Prescribing" and with that 6.31 is "Change in or recommendation for regimen." As many as 5 levels of hierarchy are used (see Table 1).

Evidence for the reliability and validity of the GMIAS has been previously reported [32] and is available at https://sites.google.com/a/brown.edu/m-barton-laws/home/gmias. Interrater reliability was good, with Kappas of 0.80 for topic codes between the developer of the GMIAS (MBL) and 3 other coders, and 0.71 for speech acts. Agreement was even higher at the highest level of hierarchy (e.g., 6.x).

In analyses we used a derived variable called the verbal dominance ratio, which is defined as the number of physician utterances divided by the number of patient utterances.

## Analyses

In the models we built, dialogue characteristics were the dependent variables and patient race/ethnicity was the independent variable. We computed "verbal dominance," the ratio of provider to patient utterances, as a dependent variable. Because the GMIAS produces counts of dialogue events which are markedly non-normal, we used negative binomial regression to predict the amount of ARV-adherence related dialogue. Because there was hierarchy in the data structure (patients clustered within physicians), we developed a two-level model. At the physician level we adjusted for physician age and gender, and physician was a random effect. At the patient level we adjusted for site, patient age, patient sex, HIV viral load (undetectable vs. detectable, with undetectable defined as <75/ml), CD4 count, self-reported adherence. In our dataset we had several self-report items. Because our goal in this analysis was to adjust for differences in actual adherence, we used the item that was most strongly associated with race/ethnicity. This approach produces the most conservative estimate of differences in adherence dialogue by race/ethnicity. The item was: What percent of the time were you able to take your medications exactly as your doctor prescribed them?" (11 categories, 0, 10, 20,…100%) [33]. Using this measure, Black patients reported taking a lower percentage of their medications than White or Hispanic patients (84% vs. 91.7%, vs. 90.2%, p=.0002). We did not adjust either for alcohol and drug use, or patient ratings of physician-patient communication quality, because in bivariate analyses these variables were not significantly associated with race (p>0.05). Analyses were done using SAS, version 9.3 (SAS Institute Inc, Cary, NC).

Using this approach we estimated three sets of models, each examining the association of race/ethnicity (the independent variable) with different dialogue characteristics as dependent variables. In each model, the generalized score test for type III contrasts was computed for each independent variable. In the first model the dependent variable was the number of utterances in major GMIAS topic groups. In the second model the dependent variable was

different GMIAS speech act patterns. In the third model the dependent variable was the number and percent of directive and expressive utterances within the ARV adherence topic code.

## Results

### Physician and patient characteristics

Of the 45 index providers, 26 (57.8%) were female. Thirty four were physicians, 7 were nurse practitioners, 3 were physician assistants, and one was a Registered Nurse. Thirty (66.7%) were white, non-Hispanic, 2 (4.4%) were African American, 1 (2%) was Latino, and 11 (24%) were Asian.

The mean patient age was 45.4 years (Table 2), and 266 (66%) were male. Black patients were less likely than Hispanic or White patients to be male (58%, 80%, and 76%, respectively, (p=0.0004). Black and Hispanic patients were more likely than Whites to have a detectable viral load (67%, 63%, and 46%, respectively, p=0.007). Race/ethnicity varied by site (p<0.0001), for example, site 1 had no Hispanics, and site 4 had only 1 (1.7%).

### Relationship of race/ethnicity to total utterances and broad topic codes

In adjusted analyses there was no statistically significant difference in total (provider plus patient) utterances, or in provider utterances alone, by patient race/ethnicity (Table 3, p=0.13). However, Black patients made fewer total utterances, on average, than did white patients (220 vs 241, respectively, p=0.01). There were significant differences in logistics, with Hispanics having more utterances than Blacks or Whites (132 vs. 101 vs. 109, respectively p=0.04).

In adjusted analyses, physicians showed more verbal dominance in dialogue with Blacks compared with whites (data not shown, verbal dominance ratio 1.5 vs. 1.3, p=0.01).

### Relationship of race/ethnicity to speech act patterns

There were some differences in speech act patterns in the overall visits according to patient race/ethnicity (Table 4). Patient race/ethnicity was not a significantly associated with provider open questions per visit (p=0.07), but in pairwise comparisons, providers asked fewer such questions to Hispanics than whites (6.2, vs. 9.2, p=0.04). Provider open questions as a percent of provider speech acts was significantly different, with Hispanics having a lower percentage than Blacks or Whites (1.5 vs. 2.8 vs. 3.6, respectively, p=0.03). Provider open questions as a percent of total questions were significantly lower for Hispanic patients than for Blacks or Whites (10 vs 15, vs 16, respectively, p=0.02). Patient expressives (i.e., expressions of goals and/or values) per visit were significantly lower for Blacks than for Hispanics and Whites (30 vs. 38 vs 37, respectively, p=0.05). Total provider expressives were not significantly different overall, but in pairwise comparisons providers had marginally fewer expressives per visit with Black compared with White patients (20 vs. 24, p=0.08). Finally, the percentage of provider utterances which were humorous or joking was not significant overall, but in pairwise comparisons providers has fewer such utterances with Hispanic than White patients (0.3 vs. 0.5, p=0.03)

### Relationship of race to ARV adherence dialogue

In adjusted analyses of ARV adherence dialogue there were significantly more adherence in the ARV adherence and regimen category for Blacks than Whites (30 vs 20, p=0.03, Table 3), and also for the category that included both adherence and problem solving (34 vs 22, p=0.02). Similar differences were seen for the comparison of Hispanics to Whites, but because of smaller numbers of Hispanic patients (N=59) the differences were not statistically significant.

When we examined patterns of speech acts within the ARV adherence topic (Table 5), we found that providers tended to make more directive utterances with Black and Hispanic than with white non-Hispanic patients, but this effect was only statistically significant for Hispanics. In pairwise comparisons, physicians made 3.1 such utterances per visit for Hispanics compared with 1.3 for Whites (p=0.01). The percent of directive utterances for Hispanics was 14 compared to 8 for Whites (p=0.06). There were no differences for patient expressive utterances by race/ethnicity.

## Discussion

This study had three main findings. First, there were differences in patterns of speech acts in the overall encounters according to patient race/ethnicity, including greater provider verbal dominance with Black patients, and fewer expressive utterances by physicians of Black patients and also by Black patients. We also noted fewer provider open-ended questions as a percent of total speech acts, fewer provider open-ended questions as a percent of total questions and less humor and joking for Hispanic patients.

Second, there was more dialogue related to ARV adherence with both Black and Hispanic patients, even after controlling for indications for such dialogue including plasma viral load and patient self-report of non-adherence. With the exception of the logistics topic, where there were more utterances for Hispanic than White patients, there were no other topic areas in which differences by race/ethnicity were seen. Third, the dialogue about ARV adherence with Black and Hispanic patients did not include more specific problem-solving, but did include more provider directive utterances. In other words, the increased adherence-related dialogue consisted largely of general inquiry and exhortation to be more adherent, with little discussion of barriers or strategies to improve adherence.

Previous work which is comparable to the first set of observations has been done using the RIAS, which has some constructs which overlap with GMIAS constructs. The observations concerning Black patients are generally consistent with these earlier observations. Using the RIAS, providers were observed to be more verbally dominant with Black patients in the same data set used here [16], and in general medical visits [34], and to have shorter visits in a trial of interventions to improve adherence to anti-hypertensives [35]. The latter study also found less “rapport building” statements for Black as opposed to white patients, which may be consistent with our observation of fewer expressive utterances. Our observations concerning Hispanic patients have less precedent, as far as we know. We are unaware of previous work relating differences in provider open-ended questions or humor according to patient race/ethnicity, but it is plausible that cultural differences might make these types of

interaction less common. Although all of the Hispanic patients spoke English well, some of them may have been more comfortable speaking Spanish, which could also help account for less joking. We cannot speculate about the clinical importance of differences of this magnitude, and this is a topic for future work.

By isolating and characterizing in detail the dialogue about ARV adherence, the GMIAS has produced some novel findings. It is unclear how to explain or interpret the presence of more dialogue about ARV adherence with Black and Hispanic patients. Current conceptual models of disparities make reference to bias/prejudice, stereotyping and clinical differences as possible mechanisms [36, 37]. However what we observed was more, not less, communication with Black and Hispanic patients, so it is important to note that what we are trying to understand is a difference, but not a disparity, *per se*. One possible interpretation is that providers have internalized epidemiological findings that Black and Hispanic patients tend to be less adherent with ART than Whites [8–11, 38, 39] and are therefore working harder addressing adherence issues with their Black and Hispanic patients. This could be understood a type of stereotyping. A related possibility is that providers perceive, consciously or unconsciously, that their minority patients are less competent at managing HIV regimens. A recent study found that Black and Hispanic youth with Type 1 diabetes are likely to be prescribed less “intense” – i.e. easier to follow – regimens than white youth, after controlling for demographic and disease factors, and that this is associated with provider perceptions that minority families were less likely to be competent in following the more difficult regimens [40]. Such an explanation might be characterized as a bias or prejudice. We note that this argument may not apply in a direct way to HIV care because, arguably, current HIV regimens (i.e., single pill, once daily regimens such as an efavirenz/emtricitabine/tenofovir combination) are considerably simpler than treatment regimens for Type 1 diabetes. Alternatively, patients’ interests or need for more adherence dialogue could be driving these findings, which would fall in the category of clinical differences. Each of these explanations is plausible, and all may contribute. We cannot distinguish between these potential explanations with our data.

Previous work using the GMIAS found that more dialogue about ARV adherence was not associated with subsequent improvements in adherence, and we speculated that this could be related to the high degree of directiveness we found in ART problem solving discussions compared with other topic codes [17, 29]. However, we have not previously examined whether directiveness in adherence discussions was related to race/ethnicity. In this study we did not find that directiveness in problem solving dialogue was related to race/ethnicity, but problem solving dialogue was sufficiently rare that we did not expect to be able to find significant differences. We did find that directiveness was significantly greater in overall ARV discussion dialogue for Hispanics, with a similar, though nonsignificant, trend for Blacks. Because the magnitude of the difference found (3.1 vs. 1.3 utterances, and 14.3% vs. 8.1% of utterances in the ARV adherence topic) were relatively small, it is hard to know if they clinically important.

This study has limitations that we should note. There were too few providers who were ethnically concordant with the minority patients to determine whether provider race/ethnicity matters for these observations. The settings are all HIV specialty clinics, three of

them associated with academic medical centers, and all in large metropolitan areas. Hence they are not representative of all of the settings in which people receive HIV care. The Hispanic patients all spoke English and there were too few to determine any differences by migration history, generational status in the U.S., or measures of cultural affinity including preferred language; and they were at only two sites that recruited Hispanic patients due to regional variation in clinic race/ethnicity mix. As we could observe only one visit per patient, we do not know how patients' history with the provider, including any previous history with non-adherence or discussions of adherence, may have influenced the interactions. However, in analyses not shown, self-report measures of physician-patient communication were not significantly associated ($p<0.05$) with race/ethnicity. We studied patients with HIV and adherence with ART, and do not know whether our findings would generalized to conditions or medications. Finally, as noted in the Introduction, we cannot infer causation from any of the descriptive findings that we present. It is possible that the relationship between patient-provider dialogue and patient adherence is bidirectional.

In conclusion, we found more ART adherence dialogue with Black and Hispanic patients than with White patients, even after controlling for indications, and a tendency for adherence dialogue to be more directive in Hispanics than in Whites. It is difficult to know whether these differences are stylistic and non-consequential clinically, or whether they relate to patients' adherence outcomes. In spite of these interpretive ambiguities, this study does tend to support the conjecture that there are racial/ethnic differences in clinical communication, and adherence communication specifically, and suggests directions for future research. The role of clinical communication in racial and ethnic disparities in health care outcomes remains to be elucidated.

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## Table 1

GMIAS coding categories*

| General Classification | Examples of specific sub-categories |
|---|---|
| Speech Act Codes and Sub-codes | |
| Questions | |
| Representative | Representative questions can be open, closed, leading |
| Expressive | Expressive questions can be open, closed, leading |
| Check understanding/knowledge | "Do you understand?" |
| Representatives | Statements about inter-subjective reality: General, own behavior, deduction, prediction |
| Comprehension | Statements of understanding or lack of understanding |
| Expressives | Values, opinions, desires, goals |
| Emotions | Affect, e.g. "I'm so sad about my mother's illness" |
| Conversation Management | Management of turn taking or visit agenda |
| Empathy | Expression of emotional rapport, support or reassurance ("That must have been difficult") |
| Directives | Recommend, mandate, encourage |
| Commissives | Promises, offers, permissions ("Okay, I'll set a quit date.") |
| Jokes | Intended humor that can be misleading if coded literally |
| Social rituals | E.g., ritual greeting and parting statements, "Excuse me," "Thank you." |
| Missing | Poor transcript quality prevents definitive coding |
| Topic Codes and Sub-codes | |
| Biomedical | |
| ARV-related | All topics related to ARVs |
| ARV adherence | Adherence barriers, adherence problems |
| ARV side effects | Specific side effects, concern about side effects |
| ARV prescribing | Initiation of treatment or change in regimen |
| ARV problem solving | Solving problems, overcoming barriers |
| Non ARV-related | Diagnosis, symptoms, tests, risk behaviors, and treatments |
| Psychosocial | Substance abuse, recovery, emotions, relationships, health of others, social services, housing |
| Logistics | |
| Non physical exam | Appointments, referrals, record retrieval |
| Physical Exam | E.g., "Take a deep breath" |
| Socializing | E.g., "Did you see the ball game?" or "Is is still raining?" |

*This is not an exhaustive list, but presents categories most essential to this report.

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**Table 2**

Patient characteristics by race

| | All (N=404) | Black (N=245) | Hispanic (N=59) | White (N=100) | P-value |
|---|---|---|---|---|---|
| Age (mean (sd)) | 45.4 (9.5) | 45.9 (9.3) | 43.3 (8.7) | 45.2 (10.2) | 0.17 |
| Male gender (N (%)) | 266 (65.8) | 143 (58.4) | 47 (79.7) | 76 (76) | 0.0004 |
| HIVRNA ≥ 400 (N (%)) | 231 (59.2) | 36 (66.7) | 150 (63.0) | 45 (45.9) | 0.0073 |
| CD4 count (mean (sd), N=389) | 473 (333) | 488 (373) | 409 (254) | 471 (257) | 0.30 |
| Self-reported adherence (mean (sd), N=358) | 85.6 (24.9) | 83.1 (27.6) | 90 (12.3) | 89.4 (22.1) | 0.06 |
| Site (N (%)) | | | | | <.0001 |
| 1 | 124 (30.7) | 93 (38.0) | 0 (0) | 31 (31) | |
| 2 | 83 (20.5) | 24 (9.8) | 23 (39.0) | 36 (36) | |
| 3 | 129 (31.9) | 75 (30.6) | 35 (59.3) | 19 (19) | |
| 4 | 68 (16.8) | 53 (21.6) | 1 (1.7) | 14 (14) | |

* Presented in mean(std dev) or N (%). P-values are calculated by ANOVA or chi-square test.

## Table 3

Adjusted mean total utterances and utterances within major topic groups

| | Black (N=245) | Hispanic (N=59) | White (N=100) | Type 3 P-value |
|---|---|---|---|---|
| Total Utterances | 500.7 | 573.2 | 524.0 | 0.13 |
| Provider | 287.4 | 316.5 | 283.0 | 0.27 |
| Patient | 219.9[A] | 256.9 | 241.1 | 0.01 |
| Biomedical | 245.2 | 298.6 | 260.9 | 0.14 |
| Logistics** | 101.0 | 131.7[B] | 109.1 | 0.04 |
| Psychosocial | 56.0 | 52.9 | 56.5 | 0.96 |
| Socializing | 32.9 | 35.0 | 37.3 | 0.68 |
| ARV adherence topics | | | | |
| ARV adherence and regimen | 29.6[B] | 30.8 | 19.9 | 0.03 |
| ARV problem solving | 3.5 | 2.4 | 1.4 | 0.22 |
| ARV adherence + problem solving† | 34.3[B] | 33.7 | 21.8 | 0.02 |

*Adjusted for site, patient age, patient sex, HIV viral load (undetectable vs. detectable), CD4 count, self-reported adherence, and provider age and gender in a 2-level model with provider as a random effect.

**Does not include physical exam

† This is the sum of the previous 2 rows.

[A] P-value from pairwise comparison with White<0.05

[B] P-value from pairwise comparison with White<0.01

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**Table 4**

Differences in Speech Act patterns according to patient race/ethnicity.

| | Black (N=245) | Hispanic (N=59) | White (N=100) | Type 3 p-value |
|---|---|---|---|---|
| Provider open questions (per visit) | 8.8 | 6.2[B] | 9.2 | .07 |
| Provider open questions as % of provider speech acts | 2.8 | 1.5[B] | 3.6 | .03 |
| Provider open question/total questions (%) | 14.6 | 10.0[B] | 15.8 | .02 |
| Patient expressives (per visit) | 29.7[A] | 38.1 | 36.7 | .05 |
| Provider expressives (per visit) | 20.4[A] | 27.2 | 24.3 | .09 |
| Patient emotional expressives (per visit) | 12.6 | 15.7 | 14.5 | .14 |
| Provider humor or jokes (per visit) | 1.1 | 0.9 | 1.2 | .35 |
| Provider humor or jokes/total utterances (%) | 0.4 | 0.3[A] | 0.5 | .12 |

[*] Adjusted for site, patient age, patient sex, HIV viral load (undetectable vs. detectable), CD4 count, self-reported adherence, and provider age and gender in a 2-level model with provider as a random effect.

[A] P-value from pairwise comparison with White<0.05

[B] P-value from pairwise comparison with White<0.01

## Table 5

Number and percent of provider directive utterances and patient expressive utterances within the ARV adherence topic, by race/ethnicity.*

| | Black (N=245) | Hispanic (N=59) | White (N=100) | Type 3 p-value |
|---|---|---|---|---|
| Provider directive utterance count | 1.9 | 3.1[A] | 1.3 | 0.13 |
| Provider directive utterance percent | 9.6 | 14.3[A] | 8.1 | 0.32 |
| Patient expressive utterance count | 1.0 | 1.6 | 1.0 | 0.48 |
| Patient expressive utterance percent | 7.0 | 5.9 | 8.6 | 0.66 |

*Adjusted for site, patient age, patient sex, HIV viral load (undetectable vs. detectable), CD4 count, self-reported adherence, and provider age and gender in a 2-level model with provider as a random effect.

[A]P-value from pairwise comparison with White<0.05

[B]P-value from pairwise comparison with White<0.01