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Authors

White, Darcy
Grey, Jeremy A
Gorbach, Pamina M
[et al.](#)

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Racial Differences in Partnership Attributes, Typologies, and Risk Behaviors Among Men Who Have Sex With Men in Atlanta, Georgia

Darcy White^{1,5}, Jeremy A. Grey¹, Pamina M. Gorbach^{2,3}, Richard B. Rothenberg⁴, Patrick S. Sullivan¹, and Eli S. Rosenberg¹

¹ Department of Epidemiology, Rollins School of Public Health, Emory University, Atlanta, GA, USA

² Department of Epidemiology, Fielding School of Public Health, University of California, Los Angeles, CA, USA

³ Division of Infectious Diseases, David Geffen School of Medicine, University of California, Los Angeles, Los Angeles, CA, USA

⁴ Department of Epidemiology and Biostatistics, School of Public Health, Georgia State University, Atlanta, GA, USA

⁵ Department of Epidemiology, School of Public Health, University of Washington, Seattle, WA 98195, USA

Abstract

The role of main partnerships in shaping HIV transmission dynamics among men who have sex with men (MSM) has gained recognition in recent studies, but there is little evidence that existing definitions of partnership type are accurate or have consistent meaning for all men. Using data collected from 2011 to 2013 on 693 partnerships described by 193 Black and White MSM in Atlanta, GA, partnership attributes and risk behaviors were examined and compared by race, stratified in two ways: (1) by commonly used definitions of partnerships as “main” or “casual” and (2) by a new data-driven partnership typology identified through latent class analysis (LCA). Racial differences were analyzed using chi-square, Fisher's exact, and Wilcoxon–Mann–Whitney tests. Black participants were less likely to report condomless anal sex (CAS) within partnerships they labeled as main, yet they were also less likely to describe these partnerships as “primary” on a parallel question. In contrast, within strata defined by the LCA-derived typology, most partnership attributes were comparable and the likelihood of CAS was equivalent by race. These findings suggest that classification of partnerships as main or casual does not accurately capture the partnership patterns of MSM, resulting in differential misclassification by race. Future studies and interventions should refine and utilize more evidence-based typologies.

Darcy White, dpwhite@uw.edu.

Compliance with Ethical Standards

Conflict of interest ESR has an epidemiological consultation to Medidata, Inc., which is unrelated to this work. All other authors declare that they have no conflict of interest.

Keywords

HIV; Men who have sex with men (MSM); Partner type; Race; Sexual risk

Introduction

In the United States, approximately 64 % of HIV infections are attributable to male–male sexual contact (Centers for Disease Control and Prevention, 2014), and men who have sex with men (MSM) are the only group to have experienced an increase in HIV incidence over the past decade (Centers for Disease Control and Prevention, 2014; Prejean et al., 2011; Sullivan et al., 2009a). Although early HIV prevention messaging framed monogamy as an effective strategy to protect against infection, main partnerships have long been recognized as high risk for HIV transmission (Misovich, Fisher, & Fisher, 1997). Recent modeling studies indicate that one- to two-thirds of HIV transmissions among MSM are from main partners (Goodreau et al., 2012; Sullivan, Salazar, Buchbinder, & Sanchez, 2009b). As the magnitude of the contribution of main partnerships to the HIV epidemic has gained recognition, research has increasingly focused on understanding behaviors and characteristics at the level of the dyad (Chakravarty, Hoff, Neilands, & Darbes, 2012; Gomez et al., 2012; Hoff, Chakravarty, Beougher, Neilands, & Darbes, 2012; Mitchell, Harvey, Champeau, & Seal, 2012; Starks, Gamarel, & Johnson, 2014) and developing interventions specifically for couples (Purcell et al., 2014; Sullivan et al., 2014b; Wagenaar et al., 2012).

However, these studies and interventions hinge on an assumption that the main versus casual dichotomy appropriately and accurately characterizes the partnerships of MSM. A common measure of partnership type, used by the National HIV Behavioral Surveillance System (NHBS) (Centers for Disease Control and Prevention, 2011; Rosenberg, Sullivan, DiNenno, Salazar, & Sanchez, 2011; Sanchez et al., 2006) and adopted by other studies (Gass, Hoff, Stephenson, & Sullivan, 2012; Wall, Stephenson, & Sullivan, 2013), defines a main partner as someone “you feel committed to above anyone else.” Other measures use similar language, in which the distinguishing feature of a main partner is a relatively higher degree of commitment or emotional attachment (Crepaz et al., 2000). These definitions are vague and subjective, allowing for heterogeneity in the characteristics of partnerships labeled main or casual. To understand the implications of different types of partnerships for HIV transmission risk, it is important to thoroughly examine the attributes of men's partnerships and establish evidence-based typologies that provide insight as to the degree and nature of exposure to HIV that is likely to occur.

A few studies have expanded the main/casual dichotomy, providing participants with more response options and incorporating references to the seriousness or steadiness of a relationship to define different partner types (Harawa et al., 2004; Kelly, Difranciaisco, St. Lawrence, Amirkhanian, & Anderson-Lamb, 2013; Newcomb, Ryan, Garofalo, & Mustanski, 2014). Perhaps the most comprehensive and specific partnership typology in the literature, developed through qualitative research with MSM, includes seven partnership types that are distinguished with contextual details such as whether the partner is someone the participant normally socializes with and whether they had met before (Gorbach,

Drumright, Daar, & Little, 2006) (see Appendix 1). Although these definitions provide more details to define types of partners, there is no evidence that the array of categories is meaningful and relevant to all men.

In particular, it is important to consider whether existing categories of partnership type are applied consistently by race. Attempting to explain the pronounced disparity in HIV prevalence and incidence between Black and White MSM (Millett et al., 2012), studies have found that Black MSM report fewer partners overall (Berry, Raymond, & McFarland, 2007; Bingham et al., 2003; Harawa et al., 2004; Magnus et al., 2010; Millett et al., 2012; Sullivan et al., 2014a), fewer casual partners (Rosenberg et al., 2011), and lower likelihood of engaging in condomless anal sex (CAS) with their main partners (Millett et al., 2012). However, in the context of high levels of social and internalized stigma (Maulsby et al., 2014; Quinn et al., 2015), it is possible that Black MSM adopt different patterns of sexual partnering than White MSM, such that partnerships labeled main and casual may be qualitatively distinct by race. Additionally, recent analyses have demonstrated that Black MSM differentially under-report drug use and awareness of being HIV-positive (Marzinke et al., 2014; Sanchez et al., 2012; White et al., 2014). These patterns suggest that responses to value-laden items, such as those regarding sex with “casual” partners, may be subject to differential measurement error by race. To the extent that partnerships are classified differentially by Black and White participants, previously held conclusions regarding partner counts and risks by partner type might be inaccurate. Similarly, racial heterogeneity might be expected in the effectiveness of interventions aimed at couples identified as “main” partners.

Using data from a cohort of non-Hispanic Black and White MSM in Atlanta, GA, this article examines differences in partnership patterns and associated sexual risk behaviors by race. The characteristics of partnerships labeled main or casual are compared by participant race, and a set of items measuring men's degree of interaction and familiarity with their partners are used in a latent class analysis (LCA) to define a new partnership typology. Racial differences in the distribution and characteristics of partnerships according to the new, data-driven typology are examined, relative to the main/casual classification.

Method

Participants

Data are from The Men's Atlanta Networks (MAN) Project, a cross-sectional study of the sexual networks of Black and White MSM in Atlanta that was conducted from 2011 to 2013. Alongside recruitment for a related Atlanta study (InvolveMENT) (Sullivan et al., 2014a), seed participants were recruited through venue-based sampling (MacKellar et al., 2007), using a sampling frame of venues attended by MSM that was adapted from the 2008 round of the NHBS. Eligible participants identified as non-Hispanic White or non-Hispanic Black, were between the ages of 18 and 40 years, reported residence in the Atlanta metropolitan area, and reported sex with a man in the preceding 3 months. Men eligible for both studies were randomly assigned to participate in either The MAN Project or InvolveMENT. To generate network-level data, seed participants assigned to the MAN Project were asked to refer up to three recent male sex partners for participation in the study. For this analysis,

only data from seed participants were included. This study was approved by the Emory University Institutional Review Board.

Participation required a one-time visit to a study site. During the visit, participants received HIV prevention counseling and a rapid HIV test. Blood specimens were collected for sexually transmitted infection (STI) screening and, if the rapid test indicated a preliminary positive result, confirmatory HIV testing. Participants then completed a computer-assisted self-interview (CASI), after which they received the results of their rapid HIV test as well as post-test HIV prevention counseling. Results of STI and confirmatory HIV tests, when needed, were provided to the participants within 2 weeks of their study visit.

In the CASI, participants were prompted to list up to 10 sex partners (anal, oral, or vaginal) from the past 12 months. For each of the most recent 5 partners, participants were asked to describe the partner's demographic characteristics, dyadic sexual behaviors (oral, anal, or vaginal sex), and the affective and objective attributes of the partnership. An abbreviated battery of questions was administered for partners 6–10. Because the full set of attributes was needed for this analysis, the sample was restricted to the most recent five partnerships.

Measures

For partners with whom sex was reported more than once, participants were asked to indicate whether the partner is or was a main partner, defined as “someone that you feel or felt committed to above all others (someone you might call your boyfriend, significant other, life partner, or husband).” Partners not labeled main were considered casual, as were one-time partners. The language and coding for this question was designed to match the NHBS definition of partnership type (Centers for Disease Control and Prevention, 2011).

For comparison with the main/casual labeling, a follow-up question asked participants to further describe each partner by selecting 1 of 7 categories from the partnership typology developed by Gorbach et al. (2006) (see Appendix 1). The degree of involvement and familiarity in each partnership was assessed through participant's responses to a set of items from the Partnership Assessment Scale (PAS) (Gorbach et al., 2011), a 27-item scale designed to measure levels of intimacy. We selected 8 items that were determined, through expert consultation, to be (a) non-redundant and (b) broadly applicable to MSM regardless of race, socio-economic status, or life circumstances (see Appendix 1).

In addition to these affective attributes, participants were asked to indicate where or how they first met each partner and whether they anticipated having sex with the partner again. From data on partners' approximate age and race/ethnicity, indicators were created to determine whether partnerships were racially concordant and to describe the age difference between the participant and partner. The duration of each partnership was calculated using participant's estimates of the dates of first and last sex.

Six variables were used to measure sexual behavior within each partnership. Binary variables indicated whether participants discussed HIV status with each partner before they first had sex and whether they had any CAS in the past 12 months. Based on the reported average frequency of anal or oral sex and the duration of each partnership within the recall

period, a continuous variable was constructed to measure the daily probability of sex. For partnerships in which sex was reported to have occurred more than once, participants were asked to describe the most recent agreement they had about sexual encounters outside of the relationship. The final 2 variables measured whether participants reported being “buzzed on alcohol” or “high on drugs” the last time they had sex (oral or anal) with each partner.

Analysis

The first objective of analysis was to examine differences in the characteristics and risk behaviors between partnerships that Black and White participants labeled main and casual. Stratifying the sample by the main/casual classification, the distribution of partnership characteristics and reported behaviors by participant race was assessed using chi-square and Fisher's exact tests for categorical variables and Wilcoxon–Mann–Whitney tests for continuous variables.

The second objective was to develop a new, data-driven partnership typology for MSM and to evaluate its characteristics and variation by race. Using the 8 items selected from the PAS as manifest variables, we conducted LCA using PROC LCA (The Methodology Center, 2013) in SAS. LCA is a statistical method to identify subtypes of a hypothesized latent variable (i.e., partnership type) based on patterns of behavior indicated by manifest variables. To determine the optimal number of classes, the following indicators were examined for 1–10 class models: the Bayesian Information Criterion (BIC), Akaike's Information Criterion (AIC), and the G-squared statistic. Smaller values on these indicators signify better model fit. Model entropy was also calculated to evaluate separation of classes. To assess whether the partnership class structure differs by race, separate models were fitted to the data describing the partnerships of White and Black participants.

Partnerships were assigned to the latent class for which the posterior probability was highest, and we compared the distribution of latent partnership class by race in the sample overall and by main/casual classification using chi-square and Fisher's exact tests. Analogous to the bivariate analyses conducted with the main/casual dichotomy, within each latent class, the distribution of partnership characteristics and behaviors by participant race was analyzed using chi-square, Fisher's exact, and Wilcoxon-Mann–Whitney tests. Analyses were performed using SAS version 9.3 (SAS Institute, Cary, NC).

Results

During the recruitment period from April 2011 to January 2013, 13,046 men were approached and 5818 completed screening. Of these, 2581 (44 %) were eligible for The MAN Project and InvolveMENT, and 596 (23 % of eligible men) were randomly selected for participation in The MAN Project (as opposed to InvolveMENT). One-third of those offered participation ($n = 199$) agreed to be scheduled and attended a baseline visit, of which 196 (98 %) were still eligible and provided informed consent. One participant who enrolled twice and 2 participants who described only female or transgender partners were not included in the analysis; the final sample comprised 693 partnerships described by 193 participants.

Sixty percent of participants ($n = 115$) identified as Black and the remaining 40 % ($n = 78$) identified as White. White participants were older, with a mean age of 29.1 (SD: 6.0) relative to 26.5 (SD: 5.3) among Black participants ($p = 0.002$). Nearly all (96 %) of White participants and 80 % of Black participants identified as gay/homosexual ($p = 0.001$). Overall, the median number of partnerships described per participant was 4 (IQR: 2, 5); among Black participants the median was 4 (IQR: 2, 5), and among White participants the median was 5 (IQR: 3, 5; $p = 0.08$). In total, 397 partnerships were described by Black participants and 296 were described by White participants.

Main/Casual Classification

The proportion of partnerships that participants labeled as main was similar by race, at 23 % for Black and 21 % for White participants ($p = 0.38$). However, the characteristics of these partnerships were distinct (Table 1). Of partnerships labeled main, Black participants classified 66 % as primary partners on the Gorbach typology, whereas White participants classified 92 % as such ($p < 0.001$). In response to the PAS items, a greater proportion of White than of Black participants reported knowing the last name of main ($p = 0.02$) and casual ($p < 0.001$) partners, and having been to the house of casual partners or having had casual partners visit their house ($p < 0.001$). Among main partnerships, White participants were also more likely to report having slept in the same bed for an entire night ($p = 0.04$), shared a meal ($p = 0.001$), lived together ($p = 0.02$), and met each other's families ($p = 0.001$).

Regarding objective characteristics, a lower proportion of Black than White participants reported having met casual partners in sex venues, bars, or clubs, and a greater proportion met them through personal networks or general social settings ($p = 0.03$). A marginally significant difference ($p = 0.06$) was observed in the duration of main partnerships, with White participants reporting more partnerships that had lasted 3 months or longer. Black participants reported a greater proportion of racially concordant main and casual partners than did White participants ($p = 0.006$ and $p = 0.003$).

Stratification by main/casual classification suggested racial differences in sexual risk behavior as well. A lower proportion of Black than of White participants indicated that they had pre-sexual discussion of HIV status with casual partners ($p = 0.002$), but similar proportions reported doing so with main partners ($p = 0.25$). Within main partnerships, however, a greater proportion of White participants reported CAS in the past 12 months ($p = 0.04$). Within casual partnerships, a greater proportion of White than Black participants reported being drunk at last sex ($p = 0.03$), while a greater proportion of Black than White participants reported being high on drugs at last sex ($p = 0.04$). There was not evidence of a significant difference by race in the daily probability of sex within either partnership type ($p = 0.18$ and $p = 0.17$ for main and causal partnerships, respectively).

Latent Class Analysis

From the LCA on partnerships stratified by race, the BIC indicated a 3-class model as having the best fit for both groups. Although the AIC indicated a 4-class model for White participants and the G-squared indicated 10-class models for both racial groups, the

marginal decrease with each class beyond 3 was small. Comparison of the item-response probabilities for 3- and 4-class models supported the selection of the 3-class models, which had higher homogeneity and better latent class separation. However, these stratified models did not suggest qualitatively different item-response patterns by race (see Appendix 2), supporting use of an overall un-stratified model. From the LCA on this combined sample, the model fit criteria similarly indicated a 3-class model; the AIC and G-squared statistics suggested 4- and 10-class models, respectively (Fig. 1), but the 3-class model had higher homogeneity and better latent class separation. The entropy for this model was estimated at 0.85.

Based on the pattern of item-response probabilities (see Appendix 3), we labeled the 3 classes as high involvement, medium involvement, and low involvement. The distribution of these new partnership types in the sample was found to differ by race ($p = 0.04$; Table 2). A relatively higher proportion of partnerships described by White participants fit the high involvement profile (16 % compared to 11 %), whereas a higher proportion of partnerships described by Black participants fit the low involvement profile (42 % compared to 33 %). Comparing the main/casual to the new classification revealed further differences by race (Table 2). Among partnerships labeled main, the majority (59 %) of those described by White participants was reclassified as high involvement, compared to only 35 % of those described by Black participants.

Table 3 presents the distribution of partnership characteristics across these three new typologies. By race, the Gorbach typology labels were applied similarly within medium and high involvement partnerships. Within low involvement partnerships, however, Black participants were more likely to have applied labels of primary, regular, and occasional partner with socialization, while White participants were more likely to describe partners as one-time strangers ($p = 0.03$). Black participants were also more likely than White participants to report having met low involvement partners through personal networks or out in public and less likely to report having met them in sex venues, bars, or clubs ($p < 0.001$). Both White and Black participants had high levels of racial concordance in high involvement partnerships, but White participants were less likely to have racially concordant medium ($p = 0.02$) and low involvement partnerships ($p < 0.001$). The distribution of partnership duration was similar by race across partnership types.

For each of the new partnership types, the practice of CAS was similar by race. White participants were more likely than Black participants to report having discussed HIV status in low involvement partnerships ($p = 0.02$) and to report having any sexual agreement in high involvement partnerships ($p = 0.02$). In medium involvement partnerships, White participants were more likely to report being drunk at last sex ($p = 0.02$), while in low involvement partnerships, Black participants were more likely to report being high on drugs at last sex ($p = 0.03$).

Discussion

These findings provide comprehensive descriptions of and novel insight into the social dynamics and behavioral characteristics of the sexual partnerships of MSM. Based on

classification of partnerships as main or casual, our data suggest that Black MSM are less likely than White MSM to engage in CAS with their main partners, aligning with the conclusions from previous studies (Millett et al., 2012). However, examination of the affective and objective attributes of these partnerships and comparison with the LCA-derived typology indicates that the main/casual dichotomy does not have a consistent or clear meaning for all MSM.

In general, the data suggest that Black MSM apply the main partner label more broadly than White MSM. Among partnerships labeled main, White participants described 9 out of 10 as with a primary partner using the Gorbach typology and the remaining 1 out of 10 as with a regular partner. Black participants, on the other hand, described nearly a quarter of their main partners as occasional. Although the Gorbach typology allows for some subjectivity in the definition of primary or regular partners, the discrepancies by race suggest that Black and White men have distinct interpretations of what qualifies as a main partner. The differences in responses to the PAS items and in partnership duration provide additional evidence in support of this conclusion. White participants were more likely to have shared a meal with their main partner, slept in the same bed with him for an entire night, lived with him, and to report that they have met each other's families. Additionally, although only marginally significant, the main partnerships of White participants were more likely to be longer term.

Reclassifying partnerships according to the typologies suggested by the LCA reinforced some of these patterns. The LCA did not indicate that Black and White MSM have distinct partnership typologies, as the race-stratified models were comparable. Rather, the distribution of partnerships across the latent classes differed for Black and White participants. Black participants were more likely to have partnerships characterized by low involvement, while White participants were more likely to have partnerships characterized by high involvement. Comparison of this data-driven partnership classification to participants' labels of main or casual indicates that the partnerships labeled main by Black participants tend to be lower involvement than those of White participants.

Together, these data suggest that a main/casual dichotomy does not correspond to the sexual or interpersonal patterns of MSM. Previous studies have highlighted heterogeneity in casual partnerships (Prestage et al., 2001; van den Boom, Stolte, Sandfort, & Davidovich, 2012; Zablotska, Grulich, De Wit, & Prestage, 2011), and some have broken the casual partnership category into multiple types (Newcomb et al., 2014). But the distribution of the latent classes from this analysis across the categories of main and casual indicate that the definitional imprecision is not limited to casual partners. Notably, only 35 % of partnerships labeled main by Black participants were classified as high involvement. This has important implications for couple-level interventions; to target men in serious, interdependent relationships, more precise and data-driven definitions of partnership type are needed.

When stratifying by the LCA-derived typology, many of the differences between Black and White participants diminished or disappeared. The distribution of the Gorbach typology labels was more balanced, as was the distribution of the duration of partnerships. Additionally, reclassification by latent class shifted the associations with sexual risk

behaviors, such that no statistically significant racial differences in CAS were observed. The data indicate that the apparent difference in CAS among main partners is driven by differential interpretation of what qualifies as a main partner among Black and White men. When partnerships are classified by a typology that better captures men's relationship patterns, this difference in CAS is not evident. This finding suggests a need to reevaluate conclusions about partnership type and associated risks by race, because previous findings may be affected by misclassification of partnership type.

A more evidence-based and detailed definition of partnership types will also aid mathematical model development. The accuracy of models depends on having valid inputs; the 30 % discrepancy between estimates of the proportion of HIV transmission attributable to main partnerships from previous models (Goodreau et al., 2012; Sullivan et al., 2009b) may owe in part to the ambiguity in the definition of a main partner. By thoroughly evaluating the attributes of different partnership types, our study presents a clearer picture of the behaviors men are engaged in and the associated risks of exposure to HIV. These data will provide more accurate inputs for future models of HIV transmission among MSM—particularly for models that incorporate race.

Our study has several limitations. Because recruitment was restricted to MSM in Atlanta, the findings are not generalizable to all MSM. In particular, our study did not include Hispanic or other minority MSM, for whom partnership patterns may be distinct. Further research with other racial/ethnic groups is warranted. Additionally, this study was cross sectional, such that causality in association between factors such as partnership type and CAS cannot be inferred. Participants reported on partnerships over the past 12 months, some of which may be subject to recall bias. We also did not control for sociodemographic differences in the sample; for this analysis, our aim was to describe the universe of partnerships among community-sampled Black and White MSM in Atlanta. Relatedly, we purposefully did not control for repeated measures on respondents in order to optimally represent the distribution of partnerships in the community.

The PAS was developed through qualitative research with MSM in southern California between 2002 and 2006, such that the phrasing and content of some items may not be as relevant in the wake of the proliferation of social media and text message-based communication (e.g., “talked on the phone or by email”), or to MSM in other settings. We recommend further research to develop context-specific measures of partnership attributes. Additionally, it is possible that the responses to the PAS items were themselves subject to differential misreporting by race, as has been observed for other HIV-related behaviors (Marzinke et al., 2014; Sanchez et al., 2012; White et al., 2014). However, we expect the magnitude of potential misreporting to be lesser than in response to the less innocuous and precise measure of partnerships as either main or casual. Lastly, we assigned latent class membership based on posterior probabilities. Although this method does not account for uncertainty in latent class assignment, a simulation study concluded that it results in minimal classification errors when model entropy is at or above 0.80 (Clark & Muthén, 2009). The entropy of our model was 0.85, supporting the method we used, but it is possible that our analysis underestimated standard errors in associations with assigned latent partnership type.

Although our data suggest a 3-class typology defined by increasing levels of involvement and familiarity, future studies in differing settings are needed to confirm this class structure and establish clear parameters by which to distinguish partnership types. In developing new classes, studies should consider incorporating other measures of partnership attributes, such as power, dependence, and intimate partner violence, as these factors shape men's ability to negotiate condom use and take other precautions in a relationship (Buller, Devries, Howard, & Bacchus, 2014; Gorbach & Holmes, 2007; Mustanski, Newcomb, & Clerkin, 2011). Given evidence that partnership risks differ by age group (Crepaz et al., 2000; Davidovich et al., 2001; Sullivan et al., 2009b), future research should also stratify analyses to determine if partnership typologies differ for younger and older MSM. Finally, new tools for measurement and categorization of partnership type are needed to facilitate future research and the targeting of interventions; these measures should be validated with diverse samples to ensure that they correspond to data-driven typologies.

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Appendix 1

Questionnaire Items Regarding Affective Characteristics of Partnerships

See Table 4.

Appendix 2

Latent Class Analysis Fit Statistics and Item-Response Charts: Race Stratified

See Figs. 2 and 3.

Appendix 3

Latent Class Analysis Item-Response Probability Chart: Combined Sample

See Fig. 4.

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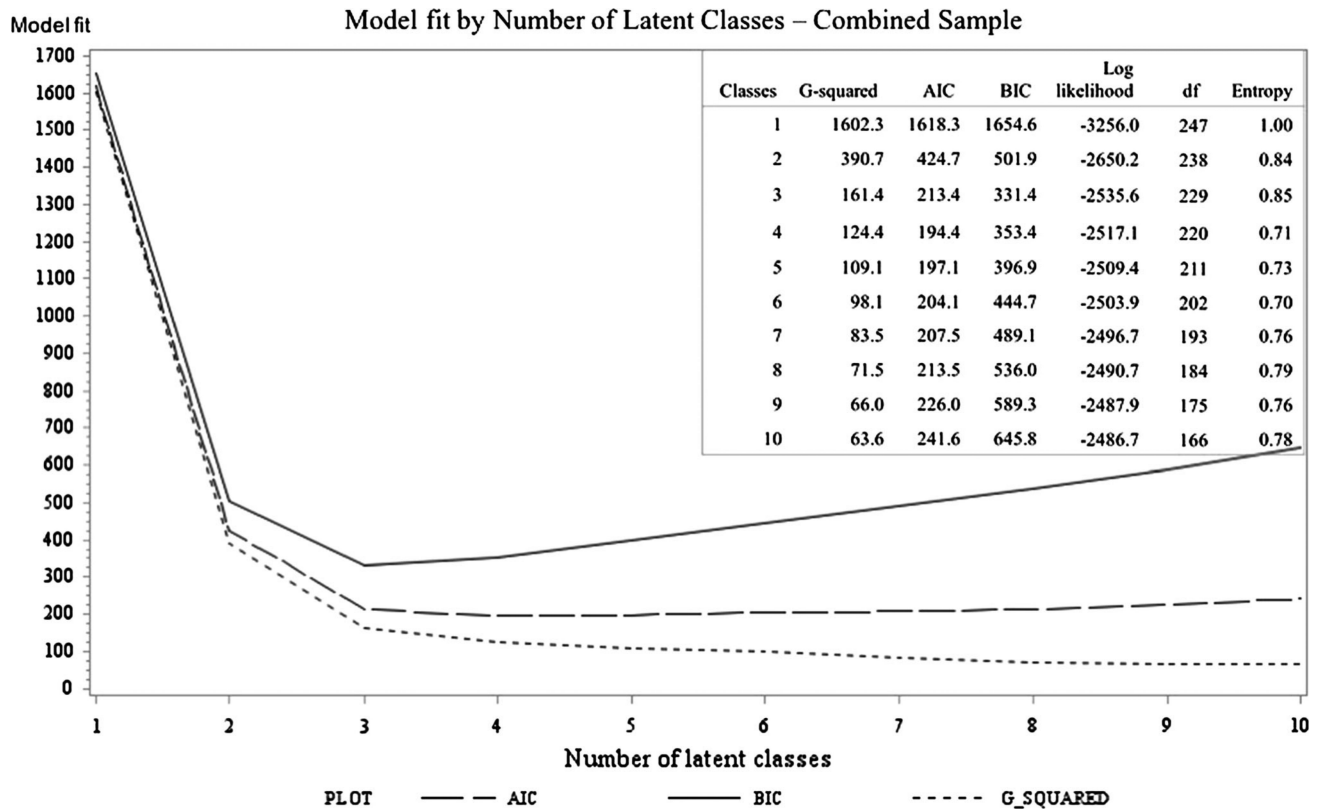


Fig. 1. Latent Class Analysis model fit statistics by number of latent classes—combined sample ($N = 693$). The *graph* and *inset* table present key indices of model fit, which were used to determine the optimal number of latent classes to fit the data. For 1–10 class models, the Bayesian Information Criterion (BIC), Akaike's Information Criterion (AIC), and the G-squared statistic were compared. The point at which the values stop decreasing signals the appropriate class number. For this latent class analysis, the BIC indicated that 3 classes was the optimal number; the marginal decrease in the AIC and G-squared for subsequent class models was comparatively small, and entropy dropped below 0.80 for models with 4 or more classes

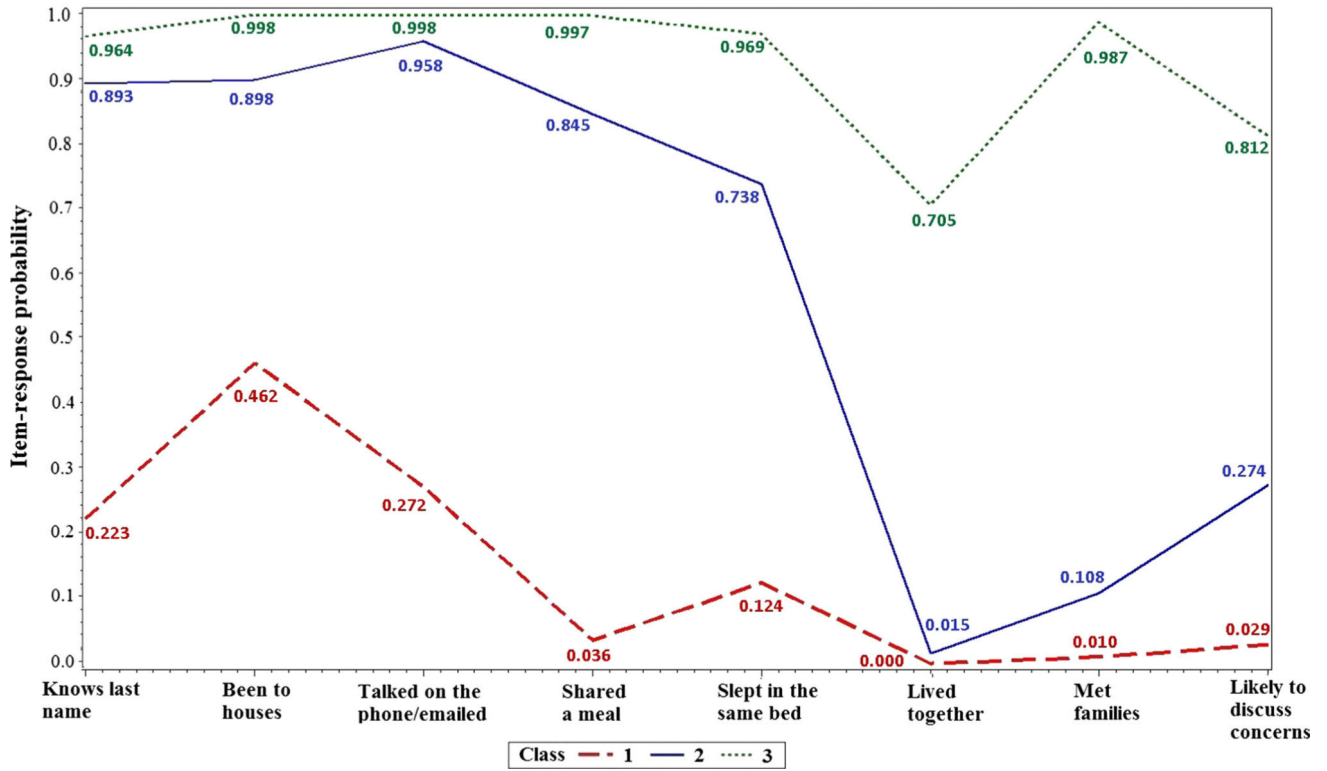


Fig. 2. Item-response probability chart for the 3-class model generated by latent class analysis on 296 partnerships described by 78 White men who have sex with men in Atlanta, GA. The *lines* and *values* indicate the probability of a “yes” response on each item conditional on being in the specific class. The three classes are each represented by different lines. The *top (green) line* represents the “high involvement” class, the *middle (blue) line* represents the “medium involvement” class, and the *bottom (red) line* represents the “low involvement” class (Color figure online)

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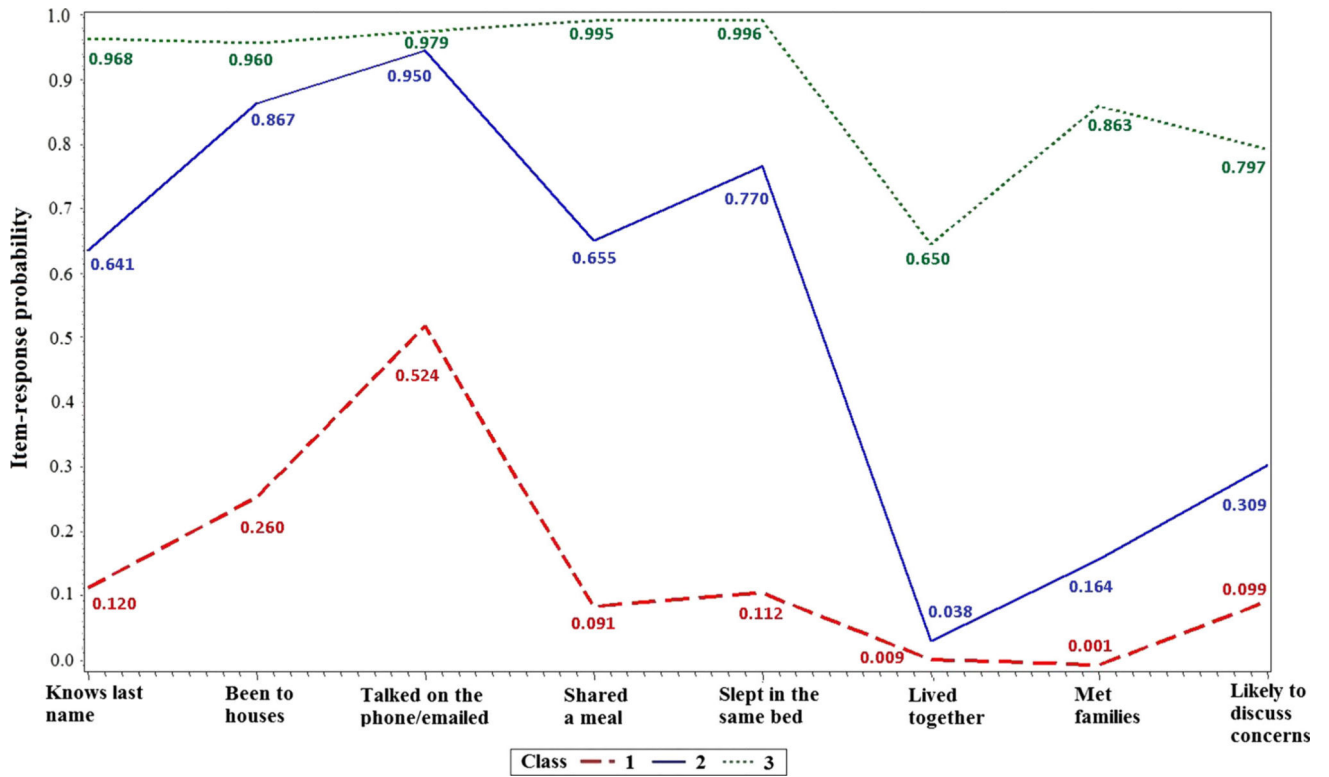


Fig. 3. Item-response probability chart for the 3-class model generated by latent class analysis on 397 partnerships described by 115 Black men who have sex with men in Atlanta, GA. The *lines* and *values* indicate the probability of a “yes” response on each item conditional on being in the specific class. The three classes are each represented by different lines. The *top (green) line* represents the “high involvement” class, the *middle (blue) line* represents the “medium involvement” class, and the *bottom (red) line* represents the “low involvement” class (Color figure online)

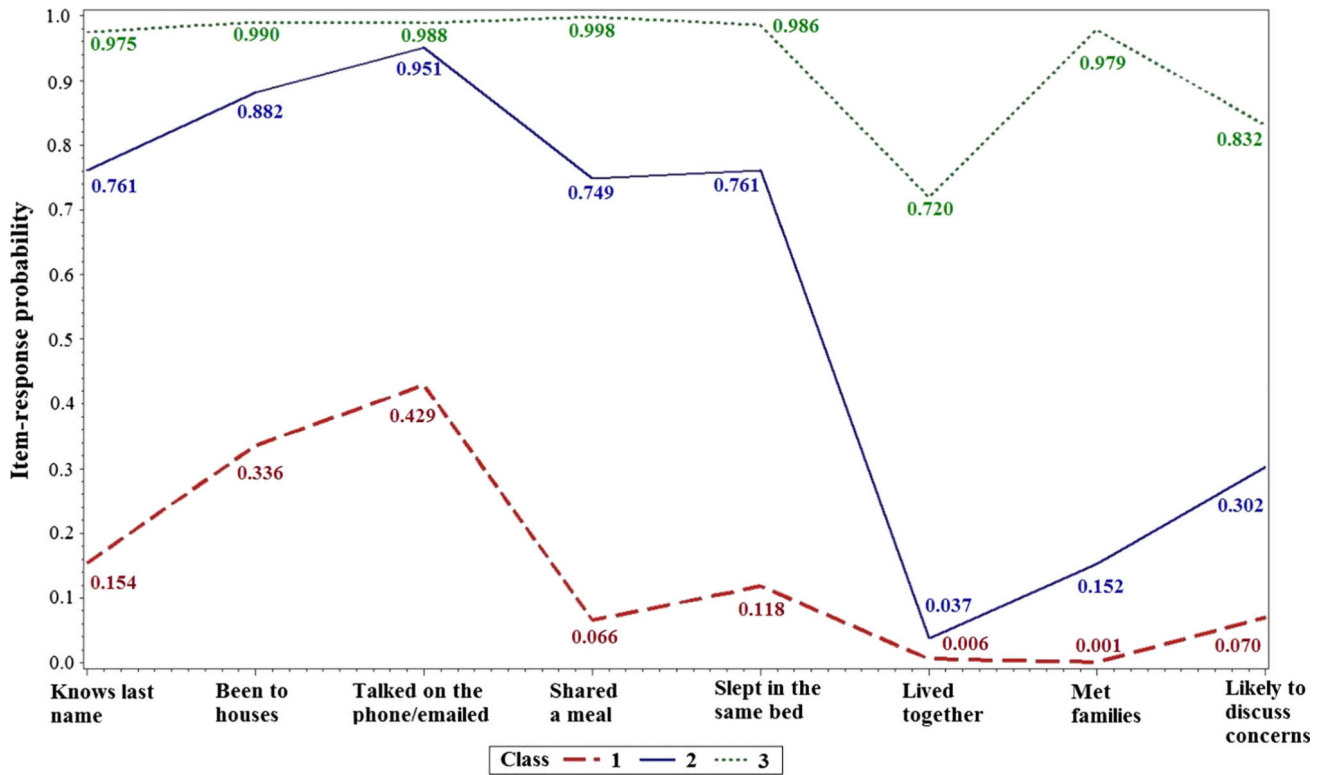


Fig. 4. Item-response probability chart for the 3-class model generated by latent class analysis on the combined sample of 693 partnerships described by 193 Black and White men who have sex with men in Atlanta, GA. The *lines* and *values* indicate the probability of a “yes” response on each item conditional on being in the specific class. The three classes are each represented by different lines. The *top (green) line* represents the “high involvement” class, the *middle (blue) line* represents the “medium involvement” class, and the *bottom (red) line* represents the “low involvement” class (Color figure online)

Table 1
Partnership characteristics of Black and White men who have sex with men in Atlanta, GA, by participant race, stratified by main partnership type (*N* = 693 partnerships, 193 participants)

	Main partner			Casual partner			<i>p</i> -value
	Black	White	<i>p</i> -value	Black	White		
	%	(<i>n</i>)	%	(<i>n</i>)	%	(<i>n</i>)	
<i>Affixive characteristics</i>							
Gorbach typologies			<0.001 ^a				0.41 ^b
Primary partner	66.3	(61)	91.8	(56)	6.8	(20)	4.7 (11)
Regular partner	10.9	(10)	8.2	(5)	9.6	(28)	6.8 (16)
Occasional partner, socialize with	17.4	(16)	0.0	(0)	24.7	(72)	26.1 (61)
Occasional partner, no socialization	5.4	(5)	0.0	(0)	13.0	(38)	16.7 (39)
One time, could find again	0.0	(0)	0.0	(0)	31.5	(92)	29.9 (70)
One-time stranger	0.0	(0)	0.0	(0)	13.4	(39)	15.8 (37)
Exchange	0.0	(0)	0.0	(0)	1.0	(3)	0.0 (0)
Relationship strength							0.46 ^c
Median (<i>n</i>)	8.0	(93)	9.0	(61)	4.0	(293)	4.0 (234)
IQR	7.0, 9.0		7.0, 10.0		1.0, 6.0		1.0, 6.0
<i>Partnership Assessment Scale items</i>							
Knows last name	81.7	(76)	95.1	(58)	35.5	(108)	58.7 (138)
Been to each other's houses	86.0	(80)	95.1	(58)	54.9	(167)	70.6 (166)
Talked on the phone or by email	96.8	(90)	100.0	(61)	71.4	(217)	64.3 (151)
Shared a meal	80.6	(75)	98.4	(60)	35.5	(108)	47.2 (111)
Slept in same bed for entire night	87.1	(81)	96.7	(59)	41.4	(126)	44.7 (105)
Lived together	29.0	(27)	47.5	(29)	4.9	(15)	3.4 (8)
Met each other's families	45.2	(42)	72.1	(44)	10.5	(32)	8.9 (21)
Likely to discuss personal concerns	72.0	(67)	65.0	(39)	15.0	(43)	17.9 (42)
Plan to have sex again							0.25
Yes	54.8	(51)	63.3	(38)	24.8	(65)	31.3 (62)
No	28.0	(26)	26.7	(16)	36.6	(96)	35.9 (71)

	Main partner				Casual partner				p-value
	Black	White	%	(n)	Black	White	%	(n)	
Unsure	17.2	10.0	16	6	38.5	32.8	101	65	
<i>Objective characteristics</i>									
Where you met									0.18
Personal networks, general social settings ^d	43.5	49.2	40	30	35.5	27.5	103	64	0.03
Online/chat lines	44.6	31.1	41	19	49.0	48.9	142	114	
Sex venues, bars/clubs	12.0	19.7	11	12	15.5	23.6	45	55	
Racially concordant	90.2	73.3	83	44	81.8	70.6	238	163	0.003
Age difference									0.23
Within 1 year	29.9	32.2	26	19	24.0	18.2	62	42	
2–5 years apart	48.3	37.3	42	22	43.0	42.9	111	99	
6–9 years apart	13.8	11.9	12	7	16.7	18.2	43	42	
10 or more years apart	8.0	18.6	7	11	16.3	20.8	42	48	
Partnership duration									0.06
One time	0.0	0.0	0	0	69.0	61.8	200	144	
Less than 1 month	20.5	8.2	18	5	11.0	15.5	32	36	
1–3 months	22.7	14.8	20	9	5.9	5.6	17	13	
3 months–1 year	28.4	34.4	25	21	8.6	11.6	25	27	
More than 1 year	28.4	42.6	25	26	5.5	5.6	16	13	
<i>Risk/protective behaviors</i>									
Discussed HIV status before first sex	71.7	80.0	66	48	47.6	61.7	131	140	0.002
Daily probability of sex									0.18 ^c
Median (n)	0.1	0.4	88	61	1.0	1.0	289	232	
IQR	0.1, 0.4	0.1, 0.4			0.2, 1.0	0.1, 1.0			
CAS in the past 12 months	52.9	70.2	45	40	30.6	28.8	91	66	0.65
<i>Sexual agreement^e</i>									
Monogamy	47.3	50.8	44	31	2.9	4.2	3	4	0.74 ^b
Outside partners, no restrictions	4.3	3.3	4	2	12.6	14.7	13	14	
Outside partners, restrictions	4.3	14.8	4	9	2.9	5.3	3	5	

	Main partner			Casual partner			<i>p</i> -value
	Black	White	<i>p</i> -value	Black	White	<i>p</i> -value	
	%	(<i>n</i>)	%	(<i>n</i>)	%	(<i>n</i>)	
No agreement	44.1	(41)	31.1	(19)	81.6	(84)	75.8 (72)
Drunk at last sex	20.2	(18)	22.0	(13)	30.0	(84)	39.1 (91) 0.03
High on drugs at last sex	14.1	(13)	5.0	(3)	14.9	(42)	9.1 (21) 0.04

IQR interquartile range, *CAS* condomless anal sex

Frequencies may not total 693 due to missing values; *p*-values are based on chi-square, unless otherwise stated

^aDue to cells with a count of zero, *p*-value calculated for primary vs. all other partnership types

^bFisher's exact *p*-value

^cWilcoxon–Mann–Whitney *p*-value

^dThis category includes having met through friends, school or work, church, a sports club/gym, a social organization, on the street, or on a vacation or cruise

^eAmong those who reported having sex more than once

Table 2
Main partner classification by new latent class assignments ($N = 693$ partnerships, 193 participants)

Latent class assignment	Overall			Main partner			Casual partner			p-value
	Black	White	p-value	Black	White	p-value	Black	White	p-value	
	% (n)	% (n)	(n)	% (n)	% (n)	(n)	% (n)	% (n)	(n)	
High involvement	11.1 (44)	15.9 (47)	0.04	35.5 (33)	59.0 (36)	0.008 ^a	3.6 (11)	4.7 (11)	0.06	
Medium involvement	47.4 (188)	51.0 (151)		55.9 (52)	39.3 (24)		44.7 (136)	54.0 (127)		
Low involvement	41.6 (165)	33.1 (98)		8.6 (8)	1.6 (1)		51.6 (157)	41.3 (97)		

p-values are based on chi-square, unless otherwise stated

^aFisher's exact p-value

Table 3
Partnership characteristics by participant race, stratified by latent class assignment ($N = 693$ partnerships, 193 participants)

	High involvement partnership			Medium involvement partnership			Low involvement partnership			p-value		
	Black		White	Black		White	Black		White			
	%	(n)	%	(n)	%	(n)	%	(n)	%		(n)	
<i>Affective characteristics</i>												
Gorbach typologies										0.59	0.03 ^b	
Primary partner	67.4	(29)	78.7	(37)	23.0	(43)	19.2	(29)	5.8	(9)	1.0	(1)
Regular partner	14.0	(6)	4.3	(2)	11.2	(21)	9.9	(15)	7.1	(11)	4.1	(4)
Occasional partner, socialize with	18.6	(8)	12.8	(6)	32.1	(60)	33.1	(50)	13.0	(20)	5.2	(5)
Occasional partner, no socialization	0.0	(0)	0.0	(0)	9.1	(17)	13.9	(21)	16.9	(26)	18.6	(18)
One time, could find again	0.0	(0)	4.3	(2)	22.5	(42)	23.2	(35)	32.5	(50)	34.0	(33)
One-time stranger	0.0	(0)	0.0	(0)	2.1	(4)	0.7	(1)	22.7	(35)	37.1	(36)
Exchange	0.0	(0)	0.0	(0)	0.0	(0)	0.0	(0)	1.9	(3)	0.0	(0)
Relationship strength												
Median (n)	8.0	(43)	9.0	(47)	6.0	(187)	6.0	(150)	2.0	(156)	1.0	(98)
IQR	7.0, 10.0		8.0, 10.0		4.0, 8.0		4.0, 8.0		1.0, 4.5		1.0, 3.0	
Plan to have sex again												
Yes	63.6	(28)	71.7	(33)	34.2	(63)	33.3	(50)	19.7	(25)	27.4	(17)
No	18.2	(8)	21.7	(10)	34.8	(64)	34.7	(52)	39.4	(50)	40.3	(25)
Unsure	18.2	(8)	6.5	(3)	31.0	(57)	32.0	(48)	40.9	(52)	32.3	(20)
<i>Objective characteristics</i>												
Where you met												
Personal networks, general social settings ^d	58.1	(25)	46.8	(22)	39.8	(74)	39.3	(59)	28.8	(44)	13.4	(13)
Online/chat lines	30.2	(13)	29.8	(14)	41.9	(78)	43.3	(65)	60.1	(92)	55.7	(54)
Sex venues, bars/clubs	11.6	(5)	23.4	(11)	18.3	(34)	17.3	(26)	11.1	(17)	30.9	(30)
Racially concordant	86.4	(38)	80.4	(37)	79.8	(146)	68.7	(103)	87.8	(137)	70.5	(67)
Age difference									0.02			
Within 1 year	30.0	(12)	37.0	(17)	25.4	(44)	20.8	(31)	24.2	(32)	13.7	(13)
2–5 years apart	55.0	(22)	34.8	(16)	43.4	(75)	40.3	(60)	42.4	(56)	47.4	(45)

	High involvement partnership				Medium involvement partnership				Low involvement partnership				
	Black		White		Black		White		Black		White		p-value
	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	
6–9 years apart	12.5	(5)	13.0	(6)	15.0	(26)	14.8	(22)	18.2	(24)	22.1	(21)	
10 or more years apart	2.5	(1)	15.2	(7)	16.2	(28)	24.2	(36)	15.2	(20)	16.8	(16)	
Partnership duration													0.79
One time	7.7	(3)	8.5	(4)	41.2	(75)	42.3	(63)	77.7	(122)	78.6	(77)	0.95 ^b
Less than 1 month	7.7	(3)	4.3	(2)	18.7	(34)	20.1	(30)	8.3	(13)	9.2	(9)	
1–3 months	10.3	(4)	8.5	(4)	13.7	(25)	9.4	(14)	5.1	(8)	4.1	(4)	
3 months–1 year	25.6	(10)	27.7	(13)	16.5	(30)	18.8	(28)	6.4	(10)	7.1	(7)	
More than 1 year	48.7	(19)	51.1	(24)	9.9	(18)	9.4	(14)	2.5	(4)	1.0	(1)	
<i>Risk/protective behaviors</i>													
Discussed HIV status before first sex	75.0	(33)	82.6	(38)	59.8	(107)	66.9	(97)	39.6	(57)	55.2	(53)	0.02
Daily probability of sex	0.2	(39)	0.3	(46)	0.3	(182)	0.4	(149)	1.0	(156)	1.0	(98)	0.87 ^c
Median (n)	0.1, 0.4		0.1, 0.4		0.1, 1.0		0.1, 1.0		1.0, 1.0		1.0, 1.0		
IQR	62.5	(25)	68.9	(31)	35.0	(64)	38.2	(55)	29.6	(47)	20.6	(20)	0.11
CAS in the past 12 months													0.19 ^{b,f}
Sexual agreement ^e													
Monogamy	43.9	(18)	51.2	(22)	20.5	(23)	14.1	(13)	14.0	(6)	0.0	(0)	
Outside partners, no restrictions	2.4	(1)	7.0	(3)	9.8	(11)	13.0	(12)	11.6	(5)	4.8	(1)	
Outside partners, restrictions	7.3	(3)	23.3	(10)	3.6	(4)	3.3	(3)	0.0	(0)	4.8	(1)	
No agreement	46.3	(19)	18.6	(8)	66.1	(74)	69.6	(64)	74.4	(32)	90.5	(19)	
Drunk at last sex	14.3	(6)	27.3	(12)	28.5	(51)	40.4	(61)	30.4	(45)	32.0	(31)	0.80
High on drugs at last sex	13.6	(6)	6.7	(3)	12.4	(23)	8.7	(13)	18.1	(26)	8.2	(8)	0.03

IQR interquartile range, CAS condomless anal sex

Frequencies may not total 693 due to missing values; p-values are based on chi-square, unless otherwise stated

^aDue to cells with a count of zero, p-value calculated for primary vs. all other partnership types

^bFisher's exact p-value

^cWilcoxon–Mann–Whitney p-value

^dThis category includes having met through friends, school or work, church, a sports club/gym, a social organization, on the street, or on a vacation or cruise

Among those who reported having sex more than once
Due to cells with a count of zero, p -value calculated for no agreement vs. any agreement

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Table 4

Questionnaire items prompting participants to describe affective characteristics of up to 5 previously named sexual partners from the past 12 months

Gorbach typology^a

If you had to further describe the type of sex partner [nickname] is/was, which of the following would you choose?

Someone who...

...is your primary sexual partner [primary partner]^b

...you have sex with on a regular basis, *but who is not your main or primary partner* [regular partner]

...you have had sexual contact with more than once, *but not on a regular basis*, and who you normally socialize with [occasional partner socialize with]

...you have had sexual contact with more than once, *but not on a regular basis*, and who you don't socialize with [occasional partner, no socialization]

...you have had sexual contact with only one time, but could find again if necessary [one time, could find again]

...you had never met before you had sexual contact and never plan to see again [one-time stranger]

...you gave sex to for money or other goods or someone who gave you sex for money or other goods [exchange]

Partnership Assessment Scale^c—selected items

Please indicate which of the following types of information you know about [nickname]

Last name

Which of the following activities have you done with [nickname]?

Talked on the phone or by email

Shared a meal

Been to his house or he has been to your house

Slept in the same bed for an entire night

Lived in the same house together

Met his family or introduced him to your family

If you are concerned or worried about something personal in your life, how likely is it that you will talk about it with [nickname]?^d

Extremely unlikely

Very unlikely

Just as likely as unlikely

Likely

Extremely likely

^aTypology developed by Gorbach et al. (2006)

^bText in brackets presents the shorthand labels used in the article to refer to each partnership typology. This text did not appear to participants

^cDeveloped by Gorbach et al. (2011)

^dAnalyzed as extremely likely or likely vs. all other responses