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Race Differentials in Partnering Patterns among Older U.S. Men: Influence of Androgens or Religious Participation?

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Abstract Using nationally representative data from the 2005–2006 U.S. National Social Life, Health, and Aging Project, this study queried race differences in older men's polyamorous and casual sex, as well as stratification of these patterns by endogenous androgens (testosterone and dehydroepiandrosterone) and by regular religious participation. Results suggested that despite their respective prominence in the biomedical and sociological literatures on sex, neither "bottom up" hormonal influences nor "top down" religious social control were major structuring factors for greater lifetime as well as current likelihood of these behaviors among older Black than White men. Androgens were higher among the former, but did not seem to drive these race patterns. Regular church attendance—while negatively associated with non-monogamous and prolific partnering, and hence possibly a social control mechanism among all men—played only a weak role in moderating ethnic variations in these behaviors. It is speculated that these differences may instead be driven by unexamined current or early factors, including, perhaps, Black men's greater exposure to sexualizing processes in adolescence that, even in late life, may outweigh more temporally-proximal influences.

Keywords Race · Older men · Promiscuity · Polyamory · Androgens · Religion

Introduction

An established literature documents more prolific as well as non-exclusive sexual partnering[1] among Black than White men, at least at younger ages (Adimora et al., 2001; Bakken & Winter, 2002; Caetano & Hines, 1995; Carey, Senn, Seward, & Vanable, 2010; Finer, Darroch, & Singh, 1999; Laumann, Gagnon, Michael, & Michaels, 1994; Peterson, Catania, Dolcini, & Faigeles, 1993; Taylor et al., 2011; Treas & Giesen, 2000)—with both academic studies and mass media suggesting a role of this factor in greater marital and family instability in Black communities (Anderson, 1990; Bowser, 1994; Mahay, Laumann, & Michaels, 2001).

A separate literature on the "challenge hypothesis" indicates a causal impact of higher endogenous androgens on men's less "inhibited" partnering (Archer, 2006; Wingfield, Hegner, Dufty, & Ball, 1990)—both with testosterone (T) and its precursor dehydroepiandrosterone (DHEA). Moreover, while DHEA patterns remain underexplored, recent large-sample studies suggest that at least T may be more elevated among older Black than White men (Gapstur et al., 2002; Nyante et al., 2012). However, explorations of the role of these androgens in influencing race-differences in men's partnering behaviors, particularly in late life, remain lacking. A separate, sociological literature suggests that in addition to such "bottom-up" hormonal influences, sexual activity may also be shaped by "top down"

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[1] An earlier version of this article used the term "promiscuity" to describe these patterns, in keeping with extant scientific literature. Specifically, in both sociobiology and evolutionary psychology, "promiscuity" denotes a particular trans-species reproductive strategy involving both polyamory and short-term casual mating (Archer, 2006; Buss & Shackelford, 1997; Pinkerton & Abramson, 1995; Schenk & Pfrang, 1986; Schmitt & Buss, 2001; Wingfield, Hegner, Dufty, & Ball, 1990). However, based on reviewers' comments on the potentially normative and pejorative interpretations of this label, it was excluded from this final version.

social control—exerted, in particular, through ties to church-centered social networks (Burdette, Ellison, Sherkat, & Gore, 2007; Burdette & Hill, 2009; Halpern, Udry, Campbell, Suchindran, Mason, 1994). Early "biosocial" studies also find additive or autonomous effects of such religious involvement and androgens on sexual expression—at least early in the life course (Halpern et al., 1994). However, as with hormones, the role of religious participation in influencing older men's race-variations in their partnering behaviors remains underexplored.

Using data from the 2005–2006 National Social Life, Health, and Aging Project (NSHAP)—a nationally-representative probability sample of U.S. adults aged 57–85—the present study begins to fill these gaps. Two questions were explored: (1) race differences in older men's polyamorous and casual partnering and (2) potential stratification of these patterns by endogenous androgens and by regular religious participation.

Race Differentials: Partnerships, Androgens, Religious Participation

As noted, a large literature indicates more non-monogamous as well as prolific sexual partnering among younger Black than White men. In late life, however, race or other social-group differentials in sex may converge, as dysfunctions, incident health problems, and growing frailty impact all men (Das, Laumann, & Waite, 2012). Moreover, a substantial literature indicates that these problems may, in fact, be more prevalent among those Black in the U.S. (Laumann, Das, & Waite, 2008), suggesting that their sexual activity may correspondingly be lower. Yet, few studies, and no nationally-representative ones, query race differentials in partnering behaviors at this stage of the life course.

The sparse large-sample literature on androgens is somewhat less ambiguous with respect to race gaps. As noted, while such patterns remain underexplored for DHEA, large-sample studies consistently indicate higher endogenous levels of at least T among older Black than White men (Gapstur et al., 2002; Nyante et al., 2012). Intriguingly, recent nationally-representative analysis based on the National Health and Nutrition Examination Surveys (NHANES) suggests that these gaps may have widened in recent decades, possibly due to an increase in endogenous T concentrations among Black but not White men of all ages (Nyante et al., 2012). Underlying causal factors are yet to be established.

Finally, evidence remains inconclusive on older men's race patterns in religious participation. Some studies indicate lower engagement with religious institutions as well as the family among Black men but not women (Anderson, 1990; Patterson, 1998; Wilson, 1987), with accounts of underlying mechanisms potentially reflecting an implicit moralistic narrative of these men's abandonment of social roles (Burton & Snyder, 1998; Murray, 1984). In contrast, a separate literature suggests that Black men may be more strongly embedded than their White counterparts in densely interconnected network structures centered in church membership as well as the matriarchal kin group (Hill, 1999; Newman, 1999). Consistent with the latter argument, Cornwell, Schumm, and Laumann's (2008) combined-gender NSHAP study (additively including gender and ethnicity) found higher religious participation among all Black participants. However, if race associations are indeed gender-differentiated—with religious participation lower among Black men but higher among women—it is possible that combined analyses mask the former deficits.

Next, as noted, androgens and religious engagement are respectively emphasized as causal factors in the biomedical and sociological literatures on sexual expression. However, none have compared their relative roles in influencing older men's race differentials in partnering propensities. The next section addresses these potential effects.

Race and Partnership Patterns: Influence of Androgens or Religious Participation?

Multiple studies document the linkages of men's higher endogenous androgen levels with more current or lifetime partners (Alvergne, Faurie, & Raymond, 2009; Archer, 2006; Bogaert & Fisher, 1995; Gray, 2003; Peters, Simmons, & Rhodes, 2008; Pollet, van der Meij, Cobey, & Buunk, 2011; van Anders, Hamilton, & Watson, 2007), as well as with more casual and sensation-seeking sex (Archer, 2006; Dabbs & Morris, 1990). Biomedical explanatory models are rooted in the "challenge hypothesis," which proposes that these sex hormones, particularly T, may catalyze a trade-off between mating and parenting effort. Specifically, androgen elevations might induce specialized "life-history strategies" centered around prolific short-term and "extra-pair" (non-monogamous) partnering, rather than stable relationships and parental care (Archer, 2006; Wingfield et al., 1990). In other words, these men may exhibit not simply high "mating effort" (pursuit of many partners), but also a preference for non-exclusive or casual sex. Intriguingly, the patterns seem enduring, with these effects often emerging before puberty, such that men with high androgens may experience early channeling into enduringly "sexualized" life paths (Archer, 2006). Due largely to data limitations, much of this literature is focused on T. However, studies increasingly find similar patterns for other androgens, including both DHEA and DHT (dihydrotestosterone), suggesting a generalizability of influences across specific hormones (Archer, 2006; Maras et al., 2003; van Goozen, Matthys, Cohen-Kettenis, Thijssen, & van England, 1998). More proximally, multiple small-sample biomedical studies also establish a causal impact of men's androgen declines on their decreased libido as well as more erectile and ejaculatory problems (Dabbs & Dabbs, 2000; Morales, Schulman, Tostain, & Wu, 2006; Wang et al., 2009; Wu et al., 2010; Wylie et al., 2010). Thus, if androgens are indeed higher among Black men, these differentials may potentially drive their less "inhibited" sexual

activity. In other words, if race gaps in polyamorous and casual partnering are due primarily to corresponding differences in endogenous sex hormones, then Black as well as White men at the same T and DHEA levels should have similar patterns and men with high androgens should show more of these behaviors than those at lower levels, regardless of their ethnicity. If, on the other hand, these differentials are driven by factors other than hormones, then mating propensities should be higher among Black than White men regardless of their androgen levels. Finally, these reproductive steroids may moderate race gaps, such that variations in partnering patterns may be lower at least for those Black men with low T and/or DHEA, relative to their White counterparts.

In contrast to such bottom-up hormonal effects, an established sociological literature indicates that top-down social control may play a major role in shaping sexual expression, by channeling such activity into communally acceptable forms (Das et al., 2012; Laumann et al., 1994). In particular, embeddedness in a thick network of concerned social "alters" can serve as a crucial constraint on one's risky or counter-normative behaviors (Coleman, 1988; Ellingson, Laumann, Paik, & Mahay, 2004; Umberson, 1987). Especially in Black communities, connections to religious congregations, as indexed by regular church attendance, may represent a major form of such social pressures.

In recent decades, worry over the degeneration of marriage and the family in America have led to major ideological changes among both evangelical and Black Protestant churches. Specifically, these religious institutions have increasingly focused on curbing men's non-normative attitudes and behaviors toward sexuality and marriage (Hunter, 1987; Miller, 1997; Roof, 1993; Shibley, 1996). Men are perceived as the "weak link" in families and their irresponsible behaviors as one reason behind divorces and frail families, and (more generally) a disintegration of America's traditional social fabric (Wilcox, 2004, 2006). Accordingly, through sermons, church-centered networks, and mass media, Black as well as conservative congregations have expended much effort in countering these disruptive orientations (Hunter, 1987; Wilcox, 2006). Moreover, these institutions and networks strongly emphasize "decency" in social roles, i.e., hard work, monogamy and marital fidelity, avoidance of risky behaviors, and responsible parenting (Wilcox, 2006; Wilcox & Wolfinger, 2008). In addition to these overt social pressures, regular engagement with church-centered social groups may also lead to inculcation of less sexually-permissive beliefs. In turn, scripting theory posits that such internalized "cultural scenarios"—broad societal notions of what forms of sexual expression and partnership are appropriate—can strongly influence objective behaviors (Ellingson et al., 2004; Gagnon, 1991; Gagnon & Simon, 1973). Thus, even if religious participation is indeed higher among older Black men, such that lack of this social asset does not drive their greater casual and polyamorous mating, it may still inhibit or control their sexual expression more. If so, race differences in partnering behaviors may be lower at least among those Black men who attend church regularly, relative to their White counterparts.

To summarize, then, it is argued that, in contrast to the ample literature on more non-exclusive and prolific partnering among younger Black than White men, late-life variations in these propensities remain underexplored. Moreover, while studies suggest race differences in both endogenous androgens and religious participation and strong effects of both on sexual expression the relative role of these two factors in influencing corresponding gaps in partnership patterns is yet to be queried.

Method

Participants

Data were from the 2005–2006 U.S. National Social Life, Health, and Aging Project. NSHAP is a nationally-representative probability sample of 1,550 women and 1,455 men aged 57–85 years, with an oversampling of Blacks, Hispanics, men, and those 75–85. In-home interviews of household-dwelling adults in these age ranges were conducted between July 2005 and March 2006, in both English and Spanish. In addition to self-report, data included assessments of physical and sensory function, height and weight, and salivary, blood, and vaginal mucosal samples, all collected at the time of interview by non-medically trained interviewers. The survey had an unweighted response rate of 74.8 % and a weighted response rate of 75.5 % (Lindau et al., 2007; O'Muircheartaigh, Eckman, & Smith, 2009). Limiting the sample to White or Black men, a maximum of 1,255 cases were available for analysis.

Procedure

Most interviewers were experienced personnel given further training in conducting interviews by NORC at the University of Chicago and remained with the project throughout the interview period. Participant consent was obtained prior to interview. Institutional review boards at the Division of the Social Sciences and NORC at the University of Chicago approved data collection procedures (Smith et al., 2009).

Measures

Table 1 presents summary statistics for all dependent, independent, and control variables used in the analyses.

Dependent Variables

As noted, the challenge hypothesis indicates androgen effects on both intensive mating effort (pursuit of many partners) and a

Table 1 Descriptive statistics for variables used in analyses

	Partnership outcomes					Religious participation	Androgens			
	Sex partners lifetime[a]	Ever paid for sex[b]	Causal partnerships last 5 years[a]	Multiple partners in past year[b]	Current casual partner[b]	High church attendance[b,d]	T high[b,e]	DHEA high[b,f]	T (continuous, pg/mL)[c]	DHEA (continuous, pg/mL)[c]
Mean	3.44	0.26	0.19	0.03	0.07	0.39	0.25	0.24	87.93	58.06
(SE)	(0.08)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(2.02)	(3.16)
N	1,040	1,171	1,216	1,259	1,259	1,256	1,035	1,047	1,035	1,047

	Race		Race, T				Race, DHEA			
	White[b]	Black[b]	*White, T high*[b]	White, T low[b]	Black, T high[b]	Black, T low[b]	*White, DHEA high*[b]	White, DHEA low[b]	Black, DHEA high[b]	Black, DHEA low[b]
Mean	*0.90*	0.10	*0.21*	0.70	0.04	0.05	*0.21*	0.70	0.03	0.06
(SE)	*(0.01)*	(0.01)	*(0.02)*	(0.02)	(0.01)	(0.01)	*(0.02)*	(0.02)	(0.01)	(0.01)
N	*1,255*	1,255	*1,031*	1,031	1,031	1,031	*1,043*	1,043	1,043	1,043

	Race, religious participation				Control variables			
	White, low church attendance[b]	White, high church attendance[b]	Black, low church attendance[b]	Black, high church attendance[b]	Age[c]	Education[a]	Diagnosed health conditions[a]	Sex hormone supplements[b]
Mean	*0.56*	0.34	0.05	0.05	67.67	2.79	1.56	0.03
(SE)	*(0.02)*	(0.01)	(0.01)	(0.01)	(0.28)	(0.05)	(0.03)	(0.01)
N	*1,252*	1,252	1,252	1,252	1,259	1,259	1,259	1,250

All estimates restricted to White or Black men ages 57–85. Italicization denotes reference category in subsequent analyses. All estimates are weighted to account for differential probabilities of selection and differential nonresponse. Design-based standard errors are given in parentheses

[a] Ordinal variable

[b] Dummy variable

[c] Continuous variable

[d] Weekly or higher self-reported attendance of religious services

[e] Dichotomization is at top quartile for men's T—i.e., 100.45 pg/mL

[f] Dichotomization is at top quartile for men's DHEA—i.e., 69.44 pg/mL

preference for non-exclusive sex. In other words, men with higher levels of these hormones may, possibly in early adolescence, "select into" a sexualized life path centered around short-term mating. Accordingly, five indicators of both lifetime and current partnering patterns were examined, starting with self-reported *sex partners lifetime* (one's total number of female sex partners ever). Originally ranging from 0 (none) to 1,005, this variable was truncated at 6 (6 or more) to avoid extreme values driving results. Next, a dummy item queried whether a participant had *ever paid for sex*. More recent behaviors were indicated by one's self-reported number of non-marital/non-cohabiting or *casual partnerships* (in the) *last 5 years,* with the original measure running from 0 (none) to 75. As with lifetime partners, this variable was truncated at 3 (3 or more). Finally, two dichotomous measures indexed having had *multiple partners in* (the) *past year* and/or a *current casual* (non-marital/non-cohabiting) *partner*.

Next, regular religious participation was indexed by a dummy variable, based on self-report, for *high church attendance* (i.e., once a week or more). Finally, endogenous androgen—T and DHEA—levels were derived from saliva samples taken during the biomarker collection portion of the in-home interview (Gavrilova & Lindau, 2009). Following previously validated protocols (Granger et al., 2007), passive drool was used to collect whole unstimulated saliva, which was then frozen until assay. Salivary enzyme immunoassays were conducted by Salimetrics Laboratories (State College, PA), using commercially available kits. Those in the male-specific top quartiles of T (above 100.45 pg/mL) and DHEA (above 69.44 pg/mL) were inductively classified as *T high* and *DHEA high*, respectively. In addition, purely for baseline information, the original continuous forms of both androgens are also shown in Table 2.

Independent Variables

A first set of models (Table 2) examined differentials for men's sexual partnering, by their self-reported race (*White* vs. *Black*) as well as by each of the dichotomous endogenous androgen (*T high*; *DHEA high*) and regular religious participation (*high church attendance*) indicators described above. Next, to test stratification arguments (Table 3), these indicators were cross-categorized. Thus, high T was first cross-coded with race to generate a set of dichotomous variables for *White, T low*; *Black, T high*; and *Black, T low*; with *White, T high* as the reference. Similarly, race-DHEA categories were indexed by dummy indicators for *White, DHEA low*; *Black, DHEA high;* and *Black, DHEA low,* with reference to *White, DHEA high.* Finally, stratification of men's race effects by their regular religious participation was tested through dichotomous measures for *White, high church attendance*; *Black, low church attendance*; and *Black, high church attendance*; with *White, low church attendance* as the excluded category.

Control Variables

A participant's *age* was entered linearly as a continuous variable in all analyses. Additional controls were added to models examining stratification arguments (Table 3). First, *education* proxied greater knowledge of sexual issues as well as higher socioeconomic status, and was indexed by an integer score ranging from 1 (less than high school) to 4 (a Bachelor's degree or more). Next, one's total number of *diagnosed health conditions* was included. Participants were asked about any lifetime diagnoses of a range of medical conditions, of which nine—heart attack, arthritis, ulcers, asthma, stroke, hypertension, diabetes, cancer, and (among men) enlarged prostate—were combined into a single score based on the Charlson comorbidity index (Charlson, Pompei, Ales, & McKenzie, 1987; Williams, Pham-Kanter, & Leitsch, 2009). A final control was added for current use of *sex hormone supplements*. NSHAP collected a complete record of currently used medications during the in-home interview, by direct observation using a computer-based log. The Multum® drug database, based on the hierarchical classifications of the American Hospital Formulary Service, was used for coding drug names (Qato, Schumm, Johnson, Mihai, & Lindau, 2009).

Statistical Analyses

Given the theoretical focus of the study, all analyses were restricted to White or Black men. As the last section makes clear, dependent variables included ordinal, dichotomous, as well as continuous measures. Accordingly, results are from ordinal logit, logistic, and OLS regression models, respectively. To facilitate pattern-visualization, coefficients rather than odds ratios are presented for categorical outcomes. Table 2 reports baseline differentials in partnering propensities by men's race, their androgens, and regular religious participation, adjusting only their age. A wider array of controls was deliberately not used, to avoid overcontrolling raw differentials. Findings for stratification of race effects by endogenous androgens and regular church attendance are shown in Table 3. As noted, these models also added controls for three potential confounders—education, diagnosed health conditions, and current use of sex hormone supplements. While conjectures on hormonal or religious mediation could alternatively have been tested through nested models, the cross-sectional data and potential feedback made such a strategy less optimal. Moreover, such analysis would not have yielded information on moderation of race gaps by these factors.

All analyses were conducted with the STATA 12.1 statistical package (Stata Corp., 2011). Results were weighted using *svy* methods for complex survey data, first using population weights that adjusted for the intentional oversampling of Blacks and Hispanics, and also incorporated a non-response adjustment based on age and urbanicity (O'Muircheartaigh et al., 2009). Standard

Table 2 Men's age-adjusted differentials by their race, androgens, and religious participation

	Partnership outcomes					Religious participation	Androgens			
	Sex partners lifetime[a]	Ever paid for sex[b]	Causal partnerships last 5 years[a]	Multiple partners in past year[b]	Current casual partner[b]	High church attendance[b,d]	T high[b,e]	DHEA high[b,f]	T (continuous, pg/mL)[c]	DHEA (continuous, pg/mL)[c]
Race (ref: White)										
Black	0.87**	0.57*	1.40**	1.27**	0.90**	0.48**	0.89**	0.68**	29.74*	24.13*
	(0.18)	(0.27)	(0.20)	(0.37)	(0.23)	(0.14)	(0.22)	(0.23)	(13.62)	(9.02)
N	1,036	1,167	1,212	1,255	1,255	1,252	1,031	1,043	1,031	1,043
Androgens										
T high[e]	0.22	0.09	0.60*	0.16	1.05**	−0.21				
	(0.16)	(0.21)	(0.26)	(0.38)	(0.26)	(0.18)				
N	872	974	1,005	1,035	1,035	1,034				
DHEA high[f]	0.25	−0.26	0.01	0.32	0.17	0.09				
	(0.20)	(0.22)	(0.32)	(0.42)	(0.34)	(0.21)				
N	881	987	1,017	1,047	1,047	1,046				
Religious participation										
High church attendance[d]	−1.07**	−0.79**	−0.98**	−0.80^{+}	−1.07**		−0.21	0.11	−1.54	−4.86
	(0.13)	(0.16)	(0.22)	(0.43)	(0.31)		(0.18)	(0.21)	(5.26)	(5.55)
N	1,040	1,169	1,213	1,256	1,256		1,034	1,046	1,034	1,046

All analyses restricted to White or Black men ages 57–85. All models control a participant's age. All estimates are weighted to account for differential probabilities of selection and differential nonresponse. Design-based standard errors are given in parentheses

[a] Ordinal outcome. Results are from ordinal logit regression models

[b] Dummy outcome. Results are from logistic regression models

[c] Continuous outcome. Results are from OLS regression models

[d] Weekly or higher self-reported attendance of religious services

[e] Dichotomization is at top quartile for men's T—i.e., 100.45 pg/mL

[f] Dichotomization is at top quartile for men's DHEA—i.e., 69.44 pg/mL

$^{+}$ $p < .10$; * $p < .05$; ** $p < .01$

Table 3 Stratification of outcomes by cross-categories of race with androgens and religious participation

	Partnership outcomes					Religious participation	Androgens	
	Sex partners lifetime[a]	Ever paid for sex[b]	Casual partnerships last 5 years[a]	Multiple partners in past year[b]	Current casual partner[b]	High church attendance[b,c]	T high[b,d]	DHEA high[b,e]
Race, T (ref: White, T high)								
White, T low	−0.16	−0.04	−0.33	0.22	−1.30**	0.30		
	(0.17)	(0.23)	(0.36)	(0.46)	(0.33)	(0.20)		
Black, T high	0.84**^	0.77*^	1.82**^	1.66*^	0.70^{+}^	0.73*		
	(0.25)	(0.32)	(0.36)	(0.64)	(0.41)	(0.31)		
Black, T low	0.55^{+}^	0.83*^	1.12**^	1.13*	0.84**^	0.57^{+}		
	(0.27)	(0.36)	(0.39)	(0.53)	(0.31)	(0.34)		
N	867	967	998	1,028	1,028	1,027		
Race, DHEA (ref: White, DHEA high)								
White, DHEA low	−0.33	0.16	0.14	−0.29	0.02	−0.02		
	(0.21)	(0.25)	(0.35)	(0.52)	(0.39)	(0.25)		
Black, DHEA high	0.13	0.05	1.78**^	1.22^{+}^	1.52*^	0.63^		
	(0.32)	(0.40)	(0.45)	(0.64)	(0.61)	(0.44)		
Black, DHEA low	0.66*^	1.36**^	1.93**^	1.29*^	1.64**^	0.30		
	(0.27)	(0.29)	(0.40)	(0.54)	(0.41)	(0.31)		
N	876	980	1,010	1,040	1,040	1,039		
Race, religious participation (ref: White, low church attendance)								
White, high church attendance	−1.18**	−0.92**	−1.31**	−1.15	−1.29**		−0.30	0.04
	(0.14)	(0.18)	(0.32)	(0.72)	(0.39)		(0.20)	(0.24)
Black, low church attendance	0.56*^	0.61^{+}^	1.42**^	1.31**^	1.19**^		0.68*^	0.57
	(0.23)	(0.33)	(0.34)	(0.45)	(0.34)		(0.27)	(0.37)
Black, high church attendance	0.30^	0.09^	0.78**^	0.76^	0.18^		0.87**^	1.03**^
	(0.32)	(0.35)	(0.24)	(0.50)	(0.35)		(0.25)	(0.27)
N	1,032	1,158	1,200	1,243	1,243		1,027	1,039

All analyses restricted to White or Black men ages 57–85. All models control a participant's age, education, number of diagnosed health conditions, and current use of sex hormone supplements. All estimates are weighted to account for differential probabilities of selection and differential nonresponse. Design-based standard errors are given in parentheses

[a] Ordinal outcome. Results are from ordinal logit regression models

[b] Dummy outcome. Results are from logistic regression models

[c] Weekly or higher self-reported attendance of religious services

[d] Dichotomization is at top quartile for men's T—i.e., 100.45 pg/mL

[e] Dichotomization is at top quartile for men's DHEA—i.e., 69.44 pg/mL

$^{+}$ $p < .10$; * $p < .05$; ** $p < .01$

^Effect significantly higher at $p < .10$ than for included category among White men, per Wald test (In the three panels, the included categories for White men are, respectively, *White, T low*; *White, DHEA low*; and *White, high church attendance*)

errors were adjusted for sample stratification (sampling strata independently) and clustering (sampling individuals within each of 100 primary sampling units).

Results

Race Differentials: Partnerships, Androgens, Religious Participation

Consistent with expectations, all five lifetime as well as current partnership outcomes (number of sex partners ever, paid sex, casual partnerships in the preceding 5 years, multiple partners in the past year, and a current casual partner) were uniformly higher among older Black than White men (Table 2). Moreover, the former were also significantly more likely to have high endogenous T as well as DHEA, with the continuous forms of these hormones similarly elevated among these men. Contrary to lower religious social control driving their less inhibited sex, however, they were also *more* likely to regularly attend church. Similarly inconsistent with expectations, neither high T nor DHEA had uniform linkages with the sexual measures. While T was linked positively to two of these five outcomes (casual partnerships in the past 5 years; a current casual partner), none were elevated among those with high DHEA. In contrast, regular church attendance had consistently negative associations with each of these indicators.

Race and Partnership Patterns: Influence of Androgens or Religious Participation?

Results from stratified analysis (Table 3) generally ran counter to determination of men's race effects by their endogenous androgens. Each of the five sexual measures was uniformly higher among Black men with not only high but also *low* T, relative to the reference group (high-T White men). Less surprisingly, each of these effects was also significantly higher, per Wald tests, than for the included category among White men (those with low T). As among all men in Table 2, T levels also seemed to have inconsistent effects within each race group. Thus, among White men, only one outcome (a current casual partner) was less likely for those with low than high T. Similarly, separate Wald tests (not shown) indicated that only one effect (casual partnerships in the 5 preceding years) was higher among older Black men in the top quartile of this hormone than those below this threshold. (Or, in other words, T levels did not influence the effect of being Black on four of these five outcomes). Finally, also consistent with the baseline race results in Table 2, Black men with both high and low T were more likely to regularly attend church.

Results for DHEA ran even more contrary to expectations, with outcomes more uniformly elevated among Black men with *low* than high levels of this hormone—relative to high-DHEA White men in the reference group. Thus, among those Black, both categories had more casual partnerships in the 5 preceding years, as well as a higher likelihood of multiple partners in the past year and a current casual partner, with each of these effects stronger per Wald tests than for the included category among White men (with low DHEA levels). However, two of these outcomes—lifetime sex partners and paid sex—had the same linkage-patterns only for Black men with low endogenous levels of this androgen. Moreover, in separate Wald tests (not shown), at least one of these effects, paid sex, was stronger among these men than for their high-DHEA same-race peers. None of White men's outcomes, in contrast, seemed differentiated by this androgen.

Finally, results for religious participation were only partly consistent with expectations. Contrary to a role of this factor in driving race differentials, all five sexual indicators were more elevated among Black men with low church attendance, relative to their White counterparts with similarly low religious participation (Table 3). However, as among all men in Table 2, church attendance did condition outcomes *within* each ethnic group, with all five outcomes significantly lower among more religious White men than their same-race peers in the reference group who did not attend services regularly. Similarly, per separate Wald tests (not shown), three of these effects (paid sex, casual partnerships in the past 5 years, a current informal partner) were stronger among Black men with low than those with high religious participation. Finally, consistent with this social pattern at least partly attenuating or moderating race differences, only one outcome (casual partnerships in the 5 preceding years) was more elevated among Black men with high church attendance than less religious White men in the reference group.

Discussion

This study began by noting that an extensive literature suggests more prolific and non-exclusive sexual partnering among Black than White men, at least at younger ages. Moreover, there is increasing evidence on the causal effect of androgens on sex and on religious participation as a social-control mechanism inhibiting these behaviors. However, few studies, especially nationally representative ones, query the influence of these two factors on ethnic variations in older men's partnership patterns. Accordingly, data from a national probability sample of older U.S. adults were used to examine two questions: (1) race differences in older men's polyamorous and casual partnering and (2) potential stratification of these patterns by endogenous androgens and by regular religious participation.

With regard to the first question, it was noted that race or other social-group gaps in men's sexual activity may potentially converge in late life, as dysfunctions, incident health issues, and growing frailty impact all (Das et al., 2012). In addition, there is growing evidence that these problems may be more prevalent among older Black than White men (Laumann et al., 2008),

leading perhaps to more constrained sex for the former. However, corresponding differentials in partnering propensities remain underexplored. Results from age-adjusted models (Table 2) ran counter to the sexual-constraints conjecture, with not only lifetime (number of sex partners, paid sex ever) but also current or recent (casual partners in the preceding 5 years, multiple partners in the last year, a current casual partner) indicators uniformly more elevated among older Black than White men. Moreover, these findings remained fully consistent in separate robustness checks (not shown) adding controls for smoking status (as indexed by salivary cotinine), self-reported alcohol consumption and binge drinking, as well as waist circumference and body mass index.

Next, models examining the second hormonal or religious stratification question also failed to produce expected results. To recall, it was first argued that if race differences in prolific and casual partnering are driven primarily by endogenous androgens, then Black as well as White men at the same T and DHEA levels should have similar patterns, with men in both ethnic groups with elevated hormones showing more of these behaviors than those at lower levels. If, in contrast, such differentials are driven by factors other than androgens, then these outcomes should be higher among Black than White men regardless of their hormone levels. Finally, these reproductive steroids may moderate or attenuate race patterns, such that the gaps may be lower at least for those Black men with lower hormones relative to those White. Overall, the androgen results were most consistent with the second of these three conjectures. With regard to T, age-adjusted baseline models (Table 2) suggested sparse linkages of this steroid with older men's non-exclusive partnering or polyamory. Specifically, only two of these five outcomes (number of casual partnerships in the preceding 5 years, and a current such informal partner) were elevated among those in the top quartile of this hormone. Moreover, in the stratified analyses (Table 3), relative to high-T White men comprising the reference group, all five outcomes were consistently more likely not only among Black men with high but also low T, with each of these effects significantly stronger than that of White men with low T. In contrast, as among all men in Table 2, partnering patterns were not consistently differentiated by T levels within each race. Thus, among those White, only one of these five outcomes—currently having a casual partner—was less likely for those with low than high T. Similarly, in separate analysis (not shown), T did not seem to influence (i.e., underlie) the effect of being Black on four of these five outcomes, with only one association (with casual partnerships in the 5 preceding years) stronger for Black men in the top T quartile than those below this cutpoint. In other words, race variations in partnering patterns were neither "leveled out" for men at the same T levels nor were linkages consistently differentiated for those with divergent endogenous concentrations of this androgen.

DHEA results ran even more contrary to expectations. First, high DHEA did not seem linked to any of the sexual outcomes in baseline models (Table 2). Moreover, in the stratified analyses (Table 3), it was Black men with low endogenous levels of this androgen who had consistent elevations in all five of these indicators relative to their White counterparts with high DHEA although the three measures of more recent behaviors (casual partnerships in the 5 preceding years, multiple partners in the past year, a current casual partner) were similarly higher among high-DHEA Black men. Moreover, per separate Wald tests (not shown), at least one effect, on paid sex, was stronger for those Black with low than high DHEA.

In contrast to these androgen findings, results did suggest some role of regular religious participation in moderating sexual differentials. Consistent with both social control and scripting theory, baseline models (Table 2) suggested that attending church at least once a week was negatively associated with each of the five outcomes. Similar patterns obtained within each race (Table 3): not only did regular religious participation lower each outcome among White men, but per separate Wald tests (not shown), at least three effects (on paid sex, casual partnerships in the past 5 years, and a current informal partner) were stronger for those Black with low than high church attendance. Finally, religion also seemed to at least partly "suppress" or moderate between-race differentials, with only one outcome (casual partnerships in the 5 preceding years) more elevated among Black men who attended church regularly than White men in the reference group who did not. However, contrary to a lack of religious social control driving Black men's greater casual and polyamorous partnering, these men were also more likely than those White to report regular church attendance (Table 2). Moreover, even among those with low religious participation, all five sexual outcomes were more elevated among Black than White men (Table 3). Similarly, post-estimation Wald tests suggested that, relative to White men attending church regularly, partnering effects were uniformly stronger for Black men with not only low but also high religiosity. Thus, as with hormones, these race differentials did not disappear among those with similar religious involvement, suggesting only a weak attenuating role of this prosocial behavior.

To summarize, the findings above suggest that, despite their respective prominence in the biomedical and sociological literatures on sexual expression, neither endogenous androgens nor religious participation were major factors influencing older Black men's greater non-monogamous and prolific sexual partnering. In other words, these race patterns seem to be structured by forces unexamined in this study such as, potentially, early social entrainment in sexualized life trajectories (Das, 2009; Das, Parish, & Laumann, 2009). These latter conjectures could not be examined with NSHAP data due to a lack of requisite life-course indicators. However, a growing large-sample literature indicates that stressful childhood environments and insecure parental ties, particularly prevalent in Black communities (Crouch, Hanson, Saunders, Kilpatrick, & Resnick, 2000; Moore, Probst, Tompkins, Cuffe, & Martin, 2007), may induce early puberty,

precocious sexual activity, and more short-term partnering in adulthood (Belsky, Steinberg, & Draper, 1991). Among later-life factors, embeddedness in more "liberal" peer networks or neighborhood environments may induce internalization of less inhibiting cultural scenarios of sexual appropriateness (Ellingson et al., 2004). It is speculated, then, that the race patterns examined above may at least partly reflect the lingering signature of these early social influences—that, even toward the end of the life course, may outweigh at least the small set of temporally-proximal biological and social factors explored in this study.

Limitations

There were several limitations to these analyses. Most importantly, given the cross-sectional data and the lack of even retrospective time-ordered information, causal direction could not be established—for instance, between lifetime sexual patterns and current endogenous androgens. To the extent that the latter did not index long-term hormone levels, therefore, inferences of their effects on promiscuity could have been biased by feedback in the form of "social modulation" (Archer, 2006; Pollet et al., 2011). Additionally, other than salivary hormones, all analyses were based on self-report, which provided no direct evidence of sexual or religious patterns, making participants' differential sensitivity to the same factors a potential problem. As can be seen in Table 1, cell sizes were small for some of the models, including stratification of race effects by androgens and regular religious participation—making it difficult to reliably distinguish signal from noise. However, that multiple associations reached significance despite this low power indicate their strength. Perhaps most importantly, the web of interrelationships between these social, hormonal, and sexual factors has only begun to be explored, suggesting additional potential for confounding by as-yet unknown pathways. The present study should thus be seen as a broad analysis that establishes baseline linkages and lays the groundwork for further examination.

Summary

Extant literature emphasizes bottom-up hormonal influences and top-down social control, particularly through embeddedness in church-centered networks, as rival forces structuring sexual expression. Contrary to these arguments, findings from this nationally-representative U.S. study suggested that neither endogenous androgen levels nor religious participation were major factors behind greater casual and polyamorous partnering among older Black than White men. Androgens (T and DHEA) were higher among the former, but did little to influence these race patterns. Religious participation, while negatively associated with these partnering propensities, and thus a potential social control mechanism among all men, played at best a weak role in attenuating differences in these behaviors between ethnic groups. It is speculated that these variations may instead be driven by unexamined current or early-life factors, such as early social entrainment in a sexualized life trajectory.

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