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Testosterone and Self-Reported Dominance Interact to Influence Human Mating Behavior

Richard B. Slatcher[1], Pranjal H. Mehta[2], and Robert A. Josephs[3]

Abstract

In this study, 76 men came into the lab in pairs and engaged in a 7-minute videotaped mate competition for the attention of an attractive female confederate. Pre-competition testosterone (T) levels were positively associated with men's dominance behaviors and with how much the confederate indicated that she "clicked" with each participant. Dyadic analyses showed that self-reported dominance moderated the effects of T on one's own dominance behaviors and on opponents' dominance behaviors. Specifically, among men high in self-reported dominance, there was a strong positive association between T and their own dominance behaviors and a strong negative association between T and opponents' dominance behaviors. However, among men low in self-reported dominance, there was no association between T and dominance behaviors. These findings provide novel evidence linking T with evolutionarily adaptive behaviors in humans and suggest that T interacts with people's explicit dominance motives to regulate behaviors that enhance mating success.

Keywords

testosterone, personality traits, dominance, mating, implicit motives

When one person is sexually interested in another person, there are a variety of strategies that he or she can use to attract that person. Among males in particular, one effective strategy is to achieve high status or dominance in a given social group. Across nearly all vertebrate species, dominant males often have the greatest success in mating with physically attractive and fertile females (Ellis, 1995; Sadalla, Kenrick, & Vershure, 1987). Nonhuman animal studies have shown that dominance behaviors exhibited by males in their competition for mates are modulated by naturally circulating levels of the hormone testosterone (Beehner, Bergman, Cheney, Seyfarth, & Whitten, 2006; Wingfield, Hegner, Duffy, & Ball, 1990), but the role of testosterone in human mate competitions remains unclear. The purpose of this article is to investigate the associations between testosterone (T) and dominance behaviors during a laboratory mate competition in which men competed against each other for the attention of an attractive female confederate.

Men often use dominance for reproductive advantage through mate competitions (Geary, 2010). Typically, men use the direct dominance tactic of self-promotion (e.g., talking about themselves) and the indirect dominance tactic of competitor derogation to achieve mating success (Schmitt & Buss, 1996; Simpson, Gangestad, Christensen, & Leck, 1999). Research has made great headway in defining dominance—what it is and how people achieve it—and in demonstrating that dominance can lead to reproductive success. But less is known about the psychological and physiological processes involved in the links between dominance and mating. One factor suggested to play a role in dominance and mating success is the hormone T.

T is positively associated with dominance behaviors and social rank across a variety of species, including primates (Anestis, 2006; Cavigelli & Pereira, 2000; Sapolsky, 1991), birds (Collias, Barfield, & Tarvyd, 2002; Wiley & Goldizen, 2003), and other animals (Oliveira, Almada, & Canario, 1996; Ruiz-de-la-Torre & Manteca, 1999; although see Sapolsky, 2005, for a different view). Among nonhuman animal species, T secretion has been found to modulate many behaviors related to competition for mates, including sexual motivation, territoriality, mate guarding, heightened aggression, and display behaviors (Beehner et al., 2006; Dixson, 1998; Wiley & Goldizen, 2003; Wingfield et al., 1990).

[1] Wayne State University, Detroit, Michigan, USA
[2] University of Oregon, Eugene, USA
[3] The University of Texas at Austin, USA

Corresponding Author:
Richard B. Slatcher, Department of Psychology, Wayne State University, 5057 Woodward Avenue, Detroit, Michigan 48202
Email: slatcher@wayne.edu

Over the past two decades, research has demonstrated that the associations between T and dominance extend to humans. Cognitively, T is linked to heightened attention toward dominance cues such as angry, threatening faces (van Honk et al., 1999; Wirth & Schultheiss, 2007) and decreased attention toward submissive cues such as fearful faces (van Honk, Peper, & Schutter, 2005). Behaviorally, T is linked to aggression and dominance (Archer, 2006; Josephs, Sellers, Newman, & Mehta, 2006; Mazur & Booth, 1998; Mehta, Jones, & Josephs, 2008). Findings suggest that high T men achieve greater success in competitions, such as when competing on analytical reason tests (Mehta, Wuehrmann, & Josephs, 2009) and in athletic competitions (Salvador, Suay, González-Bono, & Serrano, 2003). Less attention has been paid, however, to T's role in human mate competitions.

The few studies on T and human mating behavior suggest that T plays a role in men's mating success, either by fluctuating in response to or motivating mating behaviors. For example, T levels increase when men interact with a female confederate in the lab, and these T increases are linked to confederates' ratings of how much the men are trying to impress them (Roney, Mahler, & Maestripieri, 2003). High T motivates sexual activity in adolescent boys (Halpern, Udry, Campbell, & Suchindran, 1993), increases physical risk taking in the presence of an attractive woman (Ronay & von Hippel, 2010), and increases extrapair interest and decreases commitment to monogamous relationships in men (McIntyre et al., 2006). Additionally, T levels have been found to be associated with men's self-reported number of sexual partners (M. Peters, Simmons, & Rhodes, 2008). However, the behavioral mechanisms through which high T men are able to achieve greater mating success remain unclear. Although it has been hypothesized that T enhances male mating success via dominance behaviors (Mazur & Booth, 1998; McIntyre et al., 2006), this hypothesis has yet to be tested directly in humans; the present research was designed to provide the first empirical test of this hypothesis.

It is notable that T is correlated with *implicit* measures of dominance that assess dominance motivations outside of people's conscious awareness (Schultheiss, 2007; Stanton & Schultheiss, 2009; Winter, 1973) but generally not correlated with *explicit* measures of dominance in which people are directly asked how dominant they think they are (Josephs et al., 2006; Stanton & Schultheiss, 2007; van der Meij, Buunk, van de Sande, & Salvador, 2008; but see Grant & France, 2001; Sellers, Mehl, & Josephs, 2007, for exceptions). Based on these findings, recent theorists have suggested that T serves as an implicit—or nonconscious—marker of need for dominance, with links to behavior that are distinct from explicit—or conscious—dominance measured by self-reports (Stanton & Schultheiss, 2009). Generally overlooked in previous research is the possibility that explicit, self-reported dominance may *interact* with, or moderate, the effects of T to predict behavioral dominance.

This idea is informed by previous work demonstrating that explicit and implicit personality constructs interact to predict important life outcomes, such as satisfaction with work and relationships (Winter, John, Stewart, Klohnen, & Duncan, 1998). For example, students high in explicit achievement motivation show a strong association between implicit achievement motivation and performance on a laboratory achievement task, whereas students low in implicit achievement motivation show little association between implicit motivation and performance on that same task (Brunstein & Maier, 2005). Recent research suggests that the links between hormones and behavior are similarly moderated by explicit personality characteristics. For example, Carré, Putnam, and McCormick (2009) showed that trait dominance interacts with T changes to predict aggressive behavior among men randomly assigned to "win" a rigged number tracing task. Specifically, rises in T were positively related to aggressive behavior but only among men high in trait dominance. Interactions between implicit and explicit motives have been shown with other hormones such as estradiol as well (Edelstein, Stanton, Henderson, & Sanders, in press). We argue that those who are both high in T and who explicitly see themselves as dominant—compared to those high in T but low in explicit dominance—will act especially dominant when they compete for the attention of an attractive potential mate.

The present study sought to test whether precompetition T levels influence mating behaviors when men compete against each other for the attention of an attractive female confederate. Based on previous findings, we hypothesized that T levels would be positively associated with dominance behaviors during the mate competition (Hypothesis 1); dislike of the other male competitor after the competition, which we used as a proxy measure of competitor derogation (Hypothesis 2); and success in the competition, as measured by the female confederate's rating of how much she "clicked" with that participant (Hypothesis 3). Additionally, we explored whether the links between T and dominance behaviors were moderated by self-reported dominance.

Method

Participants

Ninety-four males (47% Caucasian; 18% Hispanic/Latino; 16% Asian; 14% African America) enrolled in an introductory psychology course at the University of Texas at Austin participated in the study in exchange for course credit. Thirty (35.2%) of the participants reported being in a committed dating relationship. Saliva samples from two participants had mucous concentrations that were too high to give accurate T concentration levels (CVs > 15%). Eight men reported having a gay ($n = 5$) or bisexual ($n = 3$) sexual orientation. Data for these participants (and for those who competed against gay/bisexual participants) were excluded from analyses, resulting in 76 participants in the final data set.

Procedure

Laboratory session. Participants came to the lab in pairs between 12:00 p.m. and 4:00 p.m. to minimize the effects of

circadian fluctuations on T concentrations (Touitou & Haus, 2000). After obtaining informed consent, the experimenter collected saliva samples from each participant. The experimenter then took a head-and-shoulders photograph of each male participant, which later would be rated for how masculine each participant looked (a potential T confound; Penton-Voak & Chen, 2004). Participants completed brief questionnaires assessing self-reported dominance and basic demographic information; most relevant was whether participants currently were in a committed dating relationship, a potential confound of the effects of T (Burnham et al., 2003; van Anders & Watson, 2006).

Participants were informed that they would be having a 7-minute videotaped interaction with a female participant (both male participants and the female participant interacting together at the same time). They were told that the purpose of the interaction would be to see "what it is about certain people that allow them to click with members of the opposite sex." The experimenter then told participants that the interaction would be a competition between the two male participants: After the interaction, the experimenter would ask the female whom she "clicked" with the most. Participants were instructed that they could talk about whatever they wished, except about the nature of the competition itself. The female participant, in actuality, was one of two confederates who were research assistants in our lab. Both were youthful (age 20 and 19) and physically attractive (mean attractiveness ratings of 7.4 and 8.1 on a 9-point scale based on ratings of eight judges who did not know either confederate). After the videotaped interaction, participants completed measures assessing how likable (or unlikable) they found the other male with whom they interacted, which we used as a proxy measure of competitor derogation. At the end of the study, we had the female confederate indicate how much she had clicked with each of the male participants, which served as a measure of success in the competition.

Dominance ratings from videotapes. Four trained judges watched each videotape and evaluated the extent to which participants displayed dominance behaviors (dominant with confederate, dominant compared to competitor, aggressive, assertive, took control of interaction, and talked about himself) on a 9-point Likert-type scale (1 = *not at all*; 9 = *extremely*). Interjudge reliabilities were very good, with an average intraclass correlation coefficient (ICC [2, k]) of .73 across behaviors. Behavioral ratings were aggregated across items and across judges to form a single measure of dominance for each participant ($M = 5.06$, $SD = 1.11$).

Masculinity ratings from photos. The head-and-shoulders photographs of the male participants were cropped so that only faces and hair, but no clothing, would be visible. A team of five research assistants then rated each male participant on a 9-point Likert-type scale (1 = *not at all*; 9 = *extremely*) for how masculine looking he was ($M = 5.15$, $SD = 1.12$). Interjudge agreement for the photo ratings was very good (ICC [2, k] = .78).

Baseline Measures

Self-reported dominance. Participants completed the Need for Power subscale of the Personality Research Form (PRF) (Jackson, 1967), a validated self-report measure of dominance containing 16 true–false items (e.g., "I try to control others rather than permit them to control me"). Alpha reliability for the current sample was .82 ($M = 10.71$, $SD = 3.72$).

Postinteraction Measures

Disliking of male competitor. Following the mate competition, participants were given a two-item measure assessing (1) how likeable they thought the other male participant was (1 = *not likeable at all*; 7 = *very likeable*) and (2) their general impression of the other male participant (1 = *very negative*; 7 = *very positive*). The items were then reverse-scored and averaged to form a measure of disliking of the competitor ($\alpha = .84$, $M = 2.21$, $SD = .88$).

How much confederate clicked with participant. To measure success in the competition, the female confederate was asked to rate, on a 7-point Likert-type scale (1 = *did not click at all*; 7 = *totally clicked*), how much she "clicked" with each male participant ($M = 4.40$, $SD = 1.29$).

T Assays

Saliva samples were assayed in duplicate for T concentrations using radioimmunoassay kits at Yerkes National Primate Research Center at Emory University (Atlanta, Georgia). Intra-assay coefficient of variation (CV) averaged across all 88 participants was 6.54%; interassay CVs averaged 7.83%. Participants' T levels were typical of those found in previous research ($M = 98.90$, $SD = 36.57$). Because the raw hormone measures were positively skewed, we log-transformed all values (Dabbs et al., 1995).

Results

Intercorrelations Among Study Variables

Table 1 displays the simple correlation matrix for the study variables.[1] Included as covariates in all subsequent analyses were dating status (0 = *not dating anyone*, 1 = *currently dating*), masculine-looking based on photo ratings, and a dummy code for the confederate that participants interacted with (coded 0 or 1).

Overview of Data Analytic Strategy—The Actor–Partner Interdependence Model (APIM)

The data from participants in interaction studies such as this one are not independent: One person's behavior naturally affects the other person's behavior. For example, the extent to which men display dominance behaviors in a mate competition affects the dominance behaviors of the men they are competing against. To account for this type of interdependence in statistical analyses, researchers in recent years have begun to

Table 1. Correlations Among Study Variables

Variable	1	2	3	4	5	6
1. Testosterone	—					
2. Self-reported dominance (PRF scale)	−.07	—				
3. Masculine-looking (based on photo ratings)	−.14	.19	—			
4. Currently dating someone	.01	−.08	.10	—		
5. Dominance behaviors displayed during mate competition	.28*	.17	−.19	.07	—	
6. Disliking of competitor after mate competition	.29*	−.03	−.22†	−.15	.08	—
7. Female confederate's rating of how much she "clicked" with participant	.21†	.03	−.08	.27*	.29*	−.03

Note: 0 = *not dating anyone*, 1 = *currently dating someone*.
*$p < .05$. †$p < .08$ (two-tailed).

Table 2. APIM Associations Between Precompetition Testosterone, Self-Reported Dominance, and Outcome Variables

	Testosterone		Self-Reported Dominance	
Outcome Variable	Actor Effect	Partner Effect	Actor Effect	Partner Effect
Dominance behaviors displayed during mate competition	.29 (.11)**	−.09 (.11)	.08 (.11)	−.18 (.11)
Disliking of competitor after mate competition	.25 (.11)*	−.01 (.12)	−.01 (.11)	.02 (.12)
Female confederate's rating of how much she "clicked" with participant	.38 (.17)*	.33 (.18)†	−.01 (.17)	−.35 (.17)*

Note: Unstandardized betas (*b*) from APIM analyses are reported, with standard errors in parentheses. Testosterone and self-reported dominance regressions were run separately.
†$p < .08$. *$p < .05$. **$p < .01$ (two-tailed).

frame their analyses in the APIM (Kashy & Kenny, 2000; Kenny, 1996). APIM allows researchers to simultaneously estimate the influence of one person's personal characteristics (e.g., T levels) on his own behavior (e.g., his own dominance behaviors)—called *actor* effects—as well as the effects of his personal characteristics on his interaction partner's behaviors—called *partner* effects (e.g., the effects of men's T levels on competitors' behaviors).

Separate APIM analyses were conducted in SPSS 18.0 MIXED (Statistical Package for the Social Sciences, 2010) with T and self-reported dominance as predictor variables. In most APIM studies, dyads are heterosexual couples in which members of the dyads are statistically distinguishable by gender. However, in this case, members of the dyads (the two male competitors) are considered statistically indistinguishable. We closely followed recommendations from previous research (Kenny, Kashy, & Cook, 2006; Olsen & Kenny, 2006) for conducting APIM analyses with indistinguishable dyads in SPSS. Using this approach, one intercept is estimated for both dyad members and is constrained to be equal across the two members. Dominance behaviors displayed in the competition, disliking of competitors, and how much the female confederate "clicked" with the participant were the outcome variables. Because no previous T studies have incorporated APIM analyses, our investigation of partner effects was strictly exploratory. For more detailed descriptions of the theoretical underpinnings of APIM analyses and their practical implementation, please see Campbell and Kashy (2002), Kashy and Kenny (2000), and Kenny et al. (2006).

APIM Results

Associations between T and outcome variables. Results from APIM analyses are displayed in Table 2. Consistent with the correlations reported in Table 1, there were actor effects of men's T levels being positively associated with dominance behaviors displayed during the competition (Hypothesis 1), with disliking of competitors after the competition (Hypothesis 2), and with the female confederate's rating of how much she clicked with the participant (Hypothesis 3). There were no partner effects for T on any of the outcome variables.

Associations between self-reported dominance and outcome variables. We found no significant actor effects of self-reported dominance. There was, however, a significant partner effect of self-reported dominance being negatively associated with how much the female confederate indicated that she clicked with the other male participant. In other words, the higher men's self-reported dominance was, the less likely the female confederate was to say that she clicked with the other male participant.

Moderation of T by self-reported dominance. To examine whether one's own self-reported dominance moderated the effects of one's own T on one's own outcomes and on the competitor's outcomes, we followed the guidelines for moderation of dyadic data described in West, Popp, and Kenny (2008). In APIM analyses, we simultaneously regressed dominance behaviors on T and self-reported dominance (standardized prior to analysis) and entered with the T × Self-Reported Dominance interaction term. As shown in Table 3, there was an effect of one's own T levels predicting one's own dominance behaviors

Table 3. Effect Estimates for Self-Reported Dominance Moderating the Effect of Testosterone on Dominance Behaviors Displayed During the Mate Competition

Variable	Effect
Actor Testosterone	.30 (.10)**
Partner Testosterone	−.10 (.10)
Actor Self-Reported Dominance	.10 (.10)
Partner Self-Reported Dominance	−.16 (.10)
Actor Testosterone × Actor Self-Reported Dominance	.24 (.11)*
Partner Testosterone × Partner Self-Reported Dominance	−.37 (.12)**

Note: Unstandardized betas (b) from APIM analyses are reported, with standard errors in parentheses.
*$p < .05$. **$p < .01$ (two-tailed).

during the competition. Furthermore, there were significant interaction effects of One's Own T × One's Own Self-Reported Dominance predicting both one's own dominance behaviors and opponents' dominance behaviors displayed in the competition. As shown in Figure 1, among men high in self-reported dominance, there was a strong positive association between their own T and their own dominance behaviors (panel "a") and a strong negative association between their own T and competitors' dominance behaviors (panel "b"). In contrast, among men low in self-reported dominance, there were no actor or partner effects of their own T on dominance behaviors. Participants' dominance behaviors were therefore highest when they were both high in T and high in self-reported dominance and when they were competing against men who were low in T and/or low in self-reported dominance. Self-reported dominance did not moderate the effects of T on disliking of competitors or whether the female confederate reported clicking with participants.

Discussion

The purpose of this study was to investigate the links between T and mating behaviors in a laboratory mate competition. We found that T levels were positively associated with men's dominance behaviors during the competitions, with how much they indicated dislike for their competitor afterward, and with how much the female confederate said she "clicked" with them. Furthermore, we found an interaction between T and self-reported dominance predicting one's own dominance behaviors and opponents' dominance behaviors during the competition. The findings from this study contribute to our understanding of the links between T and human behavior by providing evidence that T levels are associated with dominance behaviors and competitive success when men vie for the attention of an attractive female. Although many nonhuman animal studies have shown that T is associated with dominance when males compete for mates, none to our knowledge has demonstrated this association in humans. Our findings are consistent with evolutionary theories proposing that T levels adaptively function to facilitate mating effort, leading to greater investment in same-sex competition and mate-seeking behavior (Ellison, 2001; McIntyre et al., 2006).

We found T to be associated not just with "overt" dominance behaviors during the competition but also with the more covert dominance behavior of indicating dislike toward the competitor after the competition and with whether the female confederate said that she "clicked" with them. These findings suggest that T levels in men may signal behaviors beyond just dominance that are broadly geared toward mating success. This is consistent with the nonhuman animal literature, which indicates that T modulates many behaviors related to competition for mates, including reproductive motivation, territoriality, heightened aggression, and display behaviors (Beehner et al., 2006; Dixson, 1998; Wickings & Dixson, 1992; Wiley & Goldizen, 2003; Wingfield et al., 1990).

These findings also contribute to our understanding of how T interacts with explicit motives to predict mating behavior. Among men high in self-reported dominance, there was a strong positive association between T and one's own dominance behaviors during the mate competition and a strong negative association between T and opponents' dominance behaviors. In contrast, among men low in self-reported dominance, there was no association between T and one's own dominance behaviors or between T and opponents' dominance behaviors. While previous studies indicate that T and self-reported dominance are conceptually distinct (Stanton & Schultheiss, 2009), this is the first evidence to our knowledge to show that they interact to predict behavioral dominance. These findings are in line with recent evidence showing that changes in T interact with self-reported dominance to predict aggression (Carré et al., 2009) and highlight an important difference between humans and nonhuman animals, demonstrating that in humans—unlike nonhuman animals—explicit, conscious motives can affect how a hormone such as T shapes behavior.

There are possible limitations of this research that should be addressed in future studies. Most important is that T levels were not experimentally manipulated. Although we took care to address potential confounds such as whether participants were in dating relationships and how dominant they looked, we cannot rule out the possibility that other individual difference variables that are conceptually related to T (e.g., implicit power motive) might have also predicted the outcomes of interest in this study.

Second, an argument could be made that our two-item measure of competitor disliking—which we used as a proxy measure of competitor derogation—does not fully capture the wide array of ways in which men can derogate their opponents. For example, previous research suggests that acts judged most successful for men to derogate a short-term competitor include saying that one's competitor "sleeps around a lot," "attacks other women," "uses people," and "is out to use women" (Schmitt & Buss, 1996). While such tactics are effective in competing against a well-known competitor, they likely would not be as effective when a competitor is relatively unknown (e.g., one would not know from a brief interaction if his

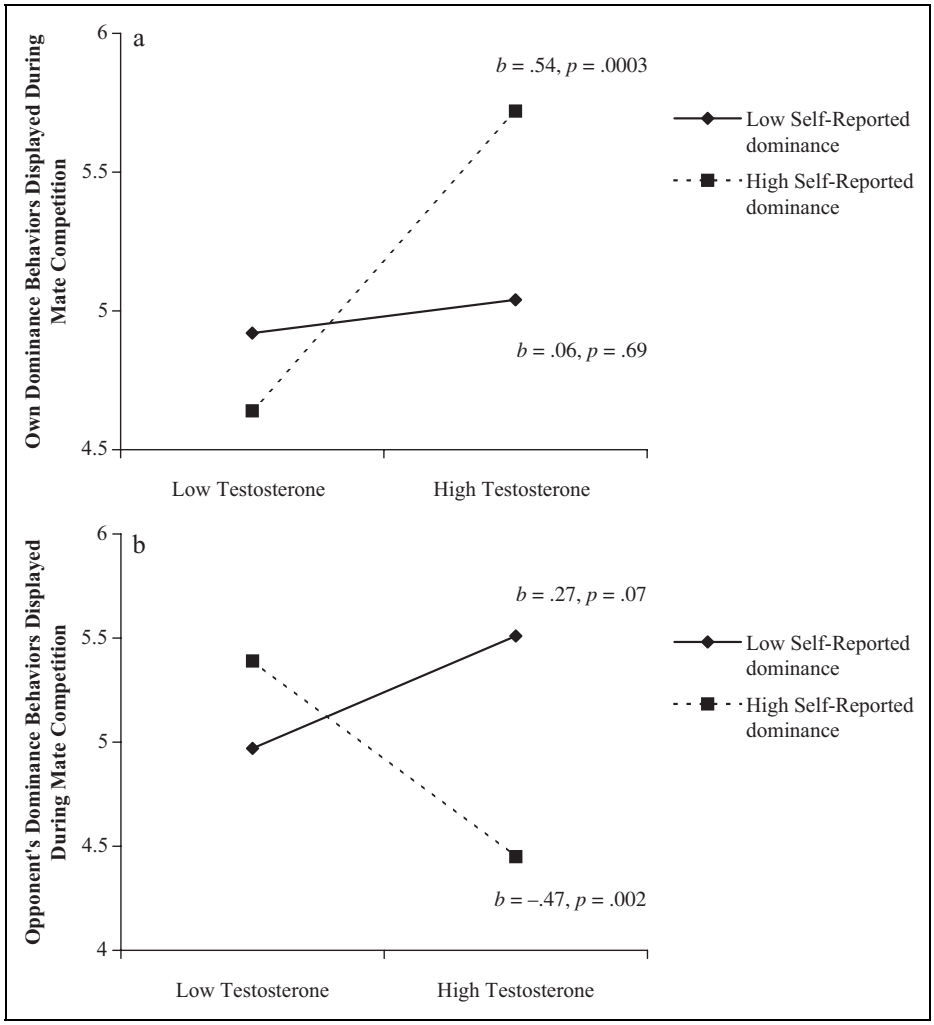

Figure 1. Effects of Participants' Own T Levels and Own Self-Reported Dominance on Their Own Dominance Behaviors Displayed During Mate Competition (Panel "a") and on Opponents' Dominance Behaviors (Panel "b")
Note: Simple slopes are plotted for individuals at 1 standard deviation above and 1 standard deviation below the means of T levels and self-reported dominance (see Aiken & West, 1991).

competitor sleeps around a lot). We would argue that saying one's competitor is unlikable—a global rather than specific derogation—should be more effective in this context. However, future studies incorporating more specific derogation items—and which have participants directly tell the female confederate what they think of their opponents—would be helpful in clarifying the ways in which high T men derogate their competitors. Similarly, future studies should include additional measures of success in mate competitions. We found that the female confederates in our study reported "clicking" more with high T men than with low T men. It is likely that this measure of success captured a wide range of positive perceptions about the men in our study, including sexual attraction but also nonsexual interpersonal attraction.

Although there are limitations of this research, there are also a number of important strengths. This is the first study to our knowledge to test the links between T and dominance in human mate competitions. By incorporating a multimethod approach, we were able to investigate how men's T levels are associated with observer-reports of dominance during the competition, with confederate reports about the men after the competition, and with the men's own self-reports of how they viewed their competitors. Building on previous research showing links between T and self-reported mating success (e.g., M. Peters et al., 2008), we showed that T is linked to observable behaviors during mate competitions as well as to a non-self-report (confederate report) indicator of success. Furthermore, we incorporated advanced statistical techniques to account for the nonindependence of participants' data and controlled for potential confounds. Finally, our inclusion of an explicit measure of self-reported dominance allowed us to investigate how both self-reported dominance and T—a marker of implicit need for dominance (Stanton & Schultheiss, 2009)—interact to predict behavioral manifestations of dominance.

Although our findings show that T levels measured prior to a mate competition predict adaptive behaviors during and after the competition, it may be the case that short-term changes in T related to the competition are also predictive of

such behaviors. Indeed, previous research has demonstrated that increases in T levels are associated with greater extraversion and self-disclosure when men socially interact with women (Roney, Lukaszewski, & Simmons, 2007) and with a desire to play again when men compete against each other in a number tracking task (Mehta & Josephs, 2006). Among several species of birds, exogenous T administration has been shown to increase mating and dominance behaviors (de Ridder, Pinxten, & Eens, 2000; Hegner & Wingfield, 1987; A. Peters, 2002; Wingfield, 1984). Building on this research, it would therefore be worthwhile to examine the effects of T changes and their interaction with self-reported dominance on mate competition behaviors in future research.

In summary, our findings demonstrate that T levels are associated with dominance behaviors and success when men compete for the attention of an attractive woman. This study adds to a growing literature showing that T is associated with dominance in humans (Mazur & Booth, 1998; Mehta et al., 2008; Sellers et al., 2007), clarifying our understanding of the role of T in mating success and its relation to traditional measures of dominance. It is our hope that these findings and the novel methodology used here will pave the way for future laboratory investigations of the links between T and human mating behavior.

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Note

1. Note that these correlations do not control for data nonindependence (e.g., the influence of the confederate's rating of how much she clicked with one participant on her rating of how much she clicked with the other participant), nor do they control for potential confounds (e.g., dating status, masculine-looking based on photos).

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Bios

Richard B. Slatcher received his BS from the University of Richmond and his PhD in social and personality psychology from the University of Texas at Austin. After completing an NIMH postdoctoral fellowship in health psychology at the University of California, Los Angeles, he joined the faculty of the Department of Psychology at Wayne State University, where he is currently an assistant professor.

Pranjal H. Mehta received his BA from Williams College and his PhD in social and personality psychology from the University of Texas at Austin. He completed a postdoctoral fellowship in social neuroscience at the University of Texas at Austin, followed by a postdoctoral fellowship in management at Columbia University. He is currently a postdoctoral fellow at Erasmus University in Rotterdam, The Netherlands. In September 2011 he will begin a new position as assistant professor in the Department of Psychology at the University of Oregon.

Robert A. Josephs is a product of the New York State public school system, remaining within that system from K through college (he received a BA in biological psychology from Cornell University, the largest of the Ivy's and the only 'hybrid' Ivy combining private and public colleges within one University). After graduating in 1983, he remained true to his public school roots, obtaining an MS in 1986 from the University of Washington under the supervision of Claude Steele. When Steele relocated to the University of Michigan in 1987, Josephs followed him to Ann Arbor, receiving the PhD in social psychology in 1990. He was hired that same year by the psychology department at the University of Texas-Austin, and has been there ever since.