



# Testosterone and the pursuit of possessions: The interaction between baseline testosterone and intrasexual competition on materialism in males<sup>☆</sup>

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## ABSTRACT

While materialism has been extensively examined from sociocultural, psychological, and individual difference perspectives, little research has explored its physiological basis. This study investigates the association between baseline testosterone, a hormone related to status-seeking motives, and materialism in males. Baseline testosterone levels were measured using salivary samples, and participants were randomly assigned to either an intrasexual competition condition or a control condition. Materialism was assessed using a standardized scale. A positive association was found between baseline testosterone levels and materialism, but only among participants in the intrasexual competition condition. In contrast, in the control condition, baseline testosterone was negatively associated with materialism. These findings suggest that, within intrasexually competitive contexts, baseline testosterone levels might promote men's pursuit of material possessions to not only enhance status and but also view possessions as more integral to one's life and a source of personal fulfillment. Our research contributes to understanding the physiological underpinnings of materialistic values and highlights the role of hormones and situational contexts in shaping materialistic values.

## 1. Introduction

Testosterone plays a significant role in shaping human male motivation and behavior (Archer, 2006). Research suggests that elevated testosterone levels have been associated with male-to-male competition and the pursuit of social dominance and status (Carré & Olmstead, 2015; Dreher et al., 2016; Mazur & Booth, 1998). Studies also indicate that testosterone influences sexual motivation and courtship behavior, highlighting its role in reproductive strategies (Isidori et al., 2005; Slatcher et al., 2011). From an evolutionary perspective, these intrasexually competitive behaviors are considered adaptive in men as they enhance a man's ability to secure and defend mates (Buss, 1998). Notably, testosterone's association with status-seeking behavior has been shown to be context dependent, manifesting more prominently when status is particularly salient (Carré & Archer, 2018; Josephs et al., 2006). Thus, testosterone seems to drive status-seeking behaviors, particularly in intrasexually competitive contexts.

One of the ways by which high-testosterone men might compete

intrasexually is via material possessions. Materialism, defined as the importance that individuals place on material possessions (Richins & Dawson, 1992), has become a defining characteristic of contemporary society. The rise of consumer culture, fueled by advertising, social media, and the relentless pursuit of economic growth, has contributed to an environment where materialistic values are increasingly prevalent (Kamal et al., 2013; Lou & Kim, 2019; Richins, 2017). As both a socio-cultural phenomenon (McCracken, 1990) and an individual difference variable (Belk, 1985; Richins & Dawson, 1992), materialism has been linked to numerous negative outcomes. For instance, it is positively associated with loneliness (Pieters, 2013), depressive symptoms (Muñiz-Velázquez et al., 2017), and personal debt (Nepomuceno & Laroche, 2015), while being negatively associated with well-being (Dittmar et al., 2014; Muñiz-Velázquez et al., 2017) and life satisfaction (Tsang et al., 2014). Highly materialistic people believe that pleasure can be obtained through material consumption, which leads them to seek immediate gratification and pleasure through their possessions (Richins, 2004). In addition, materialistic individuals believe that possessions can be used

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as important signals of success and status, and view new product acquisition as a central activity in their lives (Richins & Fournier, 1991). Consequently, they often prioritize material wealth over other aspects of life, such as relationships or personal growth (Richins, 2004). Understanding the antecedents of materialism is crucial, given its pervasive influence and association with detrimental personal and societal outcomes.

In the current work, we examine if testosterone, under intrasexually competitive circumstances, may be a predictor of materialism in men. While the psychological and sociocultural aspects of materialism have been extensively studied, few studies have explored the biological underpinnings of materialistic values. Notable exceptions include a twins study examining the genetic underpinnings of materialism (Giddens et al., 2009), as well as an fMRI study looking at the neural correlates of luxury brand processing among highly materialistic individuals (Audrin et al., 2017). A growing body of work suggests that hormones can significantly impact consumer behavior (Stanton, 2017). For example, testosterone levels have been shown to increase in response to status-enhancing activities, such as driving a luxurious sports car or handling money, and are associated with a greater willingness to take financial risks (Apicella et al., 2008; Saad & Vongas, 2009; Stanton et al., 2011; Stenstrom et al., 2018). Additionally, testosterone administration has been found to increase preferences for status-signaling products (Nave et al., 2018). However, the relationship between testosterone and materialism has received relatively little attention. Given that material possessions can serve as status symbols for materialistic individuals (Richins, 1994a, 1994b; Richins & Fournier, 1991), it is plausible that testosterone could be associated with greater materialistic values. However, an association between testosterone and materialism may only manifest itself under conditions of intrasexual competition. There are several noteworthy findings indicating that the link between testosterone and status-related behavior only manifests in certain circumstances (Carré & Archer, 2018; Josephs et al., 2006). For instance, aggression has been found to be positively associated with testosterone, but only under certain conditions or among certain individuals (e.g., males high in trait dominance, Carré & Archer, 2018). Further, consumer behavior research has found that testosterone is positively associated with status-signaling consumption behavior when intrasexual competition was primed (Dinsmore et al., 2022; Nepomuceno & Stenstrom, 2021). It should be noted that conspicuous consumption and materialism are distinct constructs. Specifically, conspicuous consumption is the behavior of spending money in a lavish or ostentatious manner with the goal of impressing others with one's wealth (Griskevicius et al., 2007; Kastanakis & Balabanis, 2012; Veblen, 1899), whereas materialism is the value that individuals place on material possessions, often without any regard for what others think (Richins, 2004). Although testosterone has been shown to be positively associated with status-signaling consumption in response to intrasexual competition (Dinsmore et al., 2022; Nepomuceno & Stenstrom, 2021), no research thus far has examined how testosterone and intrasexual competition might be associated with materialistic values.

Drawing from the literature linking testosterone and status-seeking behavior when status is salient (Josephs et al., 2006), and considering that materialism could serve as a status signaling strategy (Richins, 1994a, 1994b; Richins & Fournier, 1991), we propose that baseline testosterone levels will be positively associated with materialism within an intrasexually competitive context. The proposed connection between materialism and intrasexual competition is based on the premise that social status is an important determinant of mating value among men (Buss & Schmitt, 1993; Kenrick et al., 2001). Consistent with this premise, males demonstrate an increased willingness to spend on conspicuous luxuries when trying to attract a mate (Griskevicius et al., 2007). Here, we hypothesize that if a man is presented with a situation where he is competing with other males to impress a potential mate, his baseline testosterone will positively predict the tendency to place a stronger emphasis on material success and enhance his desire for

acquiring possessions. That is, under conditions of intrasexual competition, baseline testosterone will positively predict materialism in men. This hypothesis was tested in an experiment wherein we measure men's baseline testosterone, randomly assigned each to an intrasexually competitive condition or a control condition, and then measure materialistic values. By employing a multidisciplinary lens to investigate how intrasexual competition and baseline testosterone might influence materialism, our research aims to contribute to a deeper understanding of the physiological and psychological underpinnings of materialism.

## 2. Method

### 2.1. Subjects

Male undergraduate students ( $N = 95$ ) participated in the study in exchange for \$20. This sample size was determined by our budgetary limits, such that we collected data from as many subjects as our funding permitted. A sensitivity analysis using G\*Power for a multiple regression with four predictors indicated that we had 80 % power to detect effect sizes larger than  $f^2 = 0.15$  (Faul et al., 2009). Informed consent was obtained from all subjects. Given that intrasexual competition refers to members of the same gender competing to attract individuals of the opposite gender (Buunk & Fisher, 2009), our hypotheses pertain exclusively to heterosexual males. Thus, twelve subjects who reported a sexual orientation other than heterosexual were removed from the analyses (8 from the manipulation condition, 4 from the control condition), leaving us with a sample of 83. Considering the evidence demonstrating an association between circulating testosterone levels and age in males (Dabbs Jr, 1990; Ellison et al., 2002; Vermeulen et al., 1999), age was included as a covariate in the analyses. One subject did not report his age, leading to a final sample size of 82 for the main analyses (45 in the manipulation condition, 37 in the control condition;  $M_{\text{age}} = 23.7$ ;  $SD_{\text{age}} = 2.8$ ). The results were equally significant with or without age as a covariate.

### 2.2. Procedures

All study procedures were conducted in accordance with the Code of Ethics of the World Medical Association for experiments involving humans and received approval from the University's Ethics Review Board. We adopted established procedures from prior research for measuring salivary testosterone (e.g., Schultheiss & Stanton, 2009; Stenstrom et al., 2018). Specifically, upon their arrival at the lab, subjects were asked a series of screening questions regarding their recent activities, including whether they had: eaten or smoked within the last 60 min, consumed alcohol or exercised that day, visited the dentist that day, brushed their teeth within the last 60 min, drank anything within the last 30 min, or chewed gum within the last 30 min. Subjects who answered affirmatively to any of the screening questions were rescheduled to participate at a future date (subjects were informed of these screening procedures before coming to the lab). After completing the screening questionnaire, subjects watched 10 min of neutral videos which consisted of a series of wildlife documentaries. Subsequently, subjects used a nearby water fountain to rinse their mouths before continuing to watch 10 more minutes of neutral videos. Subjects then provided about 1.0 ml of saliva (via passive drool) into a CryoPure polypropylene vial to establish baseline testosterone levels. Following collection, each sample was promptly stored in a nearby freezer. After data collection concluded, all frozen saliva samples were transferred to a hormone analysis lab. Samples were assayed in duplicate. The mean intra-assay coefficient of variability was 3.32 %, while the inter-assay coefficient of variability, averaged across high and low controls, was 12.21 %. These values are consistent with those reported in previous research (e.g., Apicella et al., 2008).

After completing the saliva collection process, subjects commenced a Qualtrics survey and were randomly assigned to either the intrasexual

competition or control condition in a between-subjects main effect design. This manipulation consisted of a recall task that was adopted from prior work (Hill & Durante, 2011). In the intrasexual competition condition, subjects were instructed to reflect on and describe their emotional experiences when feeling romantic interest in someone who was simultaneously sought after by another man. If they had not encountered such a scenario, they were prompted to envision it hypothetically and describe the emotions they believed they would experience. Of the 45 subjects in the manipulation condition, 39 of them described recalling an intrasexually competitive situation they had experienced, whereas the other six subjects described a hypothetical intrasexually competitive scenario. In the control condition (i.e., low in intrasexual competition), subjects were instructed to remember and describe their most recent experience of doing laundry. This control condition was void of any competitive or social context. All 37 subjects in the control condition successfully described their most recent laundry experience.

### 2.3. Materials

Subjects responded to two manipulation check items that assessed the extent to which the writing task caused them to compare themselves with attractive men and increased their motivation to compete against other men to attract a romantic partner (1 = Not at all; 7 = Extremely). The two manipulation check items were averaged to create a composite measure ( $r = 0.66$ ).

Following the manipulation, subjects completed Richins' (2004) 15-item materialism scale. Examples of items included in this scale are "Some of the most important achievements in life include acquiring material possessions," "I admire people who own expensive homes, cars, and clothes," and "I wouldn't be any happier if I owned nicer things" (reversed). Responses to the materialism scale were averaged to form an index of general materialism ( $\alpha = 0.84$ ). When the measure was divided into its 3 dimensions (centrality, success, and happiness), the results for each dimension were similarly significant across all analyses. Thus, we only report herein the results using our total index of materialism. It should also be noted that subjects were recruited and additional measures were included in the questionnaire as part of a much broader research project that falls outside the scope of the current work.

### 2.4. Data analyses

A series of statistical analyses were conducted using IBM SPSS Statistics (versions 28 and 29). We began by using Cook's distance as the exclusion criterion (Fox, 1991) to gauge if any outliers had an excessive influence in the regression analyses. Next, an independent samples *t*-test was conducted to test if the intrasexual competition manipulation functioned as intended, followed by the running of descriptive analyses. Subsequently, the PROCESS macro model 1 (Hayes, version 4.2; continuous variable of baseline testosterone was grand-mean centered) was used to assess the association between baseline testosterone and materialism, and the predicted moderating role of intrasexual competition. Notably, the results reported herein remain significant without mean-centering baseline testosterone. Lastly, a set of additional analyses were conducted to shed further light on this interaction. First, the association between baseline testosterone and materialism was tested within each manipulation condition. Second, the association between intrasexual competition and materialism was tested within subjects with high, moderate, and low levels of testosterone. Third, a Johnson-Neyman analysis (i.e., a floodlight analysis) was conducted to identify the regions of significance for the interaction between intrasexual competition and materialism across different levels of baseline testosterone, specifying the values of testosterone at which the relationship became statistically significant.

## 3. Results

No outliers were found to have an excessive influence in the regression analysis (Fox, 1991). An independent samples *t*-test confirmed that subjects in the intrasexual competition condition reported significantly higher composite manipulation check scores ( $M = 3.3$ ;  $SD = 1.1$ ) than those in the control condition ( $M = 2.1$ ;  $SD = 1.5$ ;  $t = 4.20$ ,  $p < .001$ ). Thus, the intrasexual competition manipulation worked as intended.

The mean baseline testosterone level was 178.0 pg/ml ( $SD = 56.4$ ,  $\min = 59.0$ ,  $\max = 340.1$ ; see Table 1 for descriptive statistics). These levels appear to be typical for this age group ( $M_{\text{age}} = 23.7$ ;  $SD_{\text{age}} = 2.8$ ), which generally range from approximately 50 to 350 pg/ml (e.g., Apicella et al., 2008; Dinsmore et al., 2022; Carré & McCormick, 2008). There was a significant difference in baseline testosterone levels between the manipulation condition ( $M = 192.5$ ;  $SD = 57.3$ ) and the control condition ( $M = 160.3$ ;  $SD = 50.5$ ;  $t = 2.67$ ,  $p = .009$ ). This was unexpected given that subjects were randomly assigned to experimental conditions via the Qualtrics survey. To address the differences in baseline testosterone levels between conditions, we mean-centered the baseline testosterone variable in all analyses. This approach controlled for any pre-existing differences in testosterone levels while examining interaction effects. There were no significant age differences between the manipulation condition ( $M = 23.7$ ;  $SD = 3.0$ ) and the control condition ( $M = 23.6$ ;  $SD = 2.7$ ;  $t = 0.18$ ,  $p = .861$ ).

The PROCESS macro model 1 analysis revealed a significant overall model,  $F = 5.08$ ,  $p = .001$ .  $R^2 = 0.21$ ,  $f^2 = 0.26$ , and a significant association between baseline testosterone and materialism,  $\beta = -0.62$ ,  $b = -0.01$ ,  $t = -3.62$ ,  $p < .001$ , 95 % CI  $[-0.015, -0.004]$ . There was no main effect of intrasexual competition on materialism,  $\beta = 0.17$ ,  $b = 0.29$ ,  $t = 1.57$ ,  $p = .121$ , 95 % CI  $[-0.079, 0.666]$ . Age was not significantly associated with materialism,  $\beta = 0.02$ ,  $b = 0.01$ ,  $t = 0.17$ ,  $p = .868$ , 95 % CI  $[-0.058, 0.069]$ . Critically, the two main associations were qualified by a significant interaction,  $\beta = 0.47$ ,  $b = 0.01$ ,  $t = 4.30$ ,  $p < .001$ , 95 % CI  $[0.008, 0.021]$  (see Fig. 1). As predicted, within the intrasexual competition condition, baseline testosterone was positively associated with materialism,  $\beta = 0.30$ ,  $b = 0.00$ ,  $t = 2.35$ ,  $p = .022$ , 95 % CI  $[0.001, 0.009]$ . Unexpectedly, within the control condition, baseline testosterone was negatively associated with materialism,  $\beta = -0.62$ ,  $b = -0.01$ ,  $t = -3.62$ ,  $p < .001$ , 95 % CI  $[-0.015, -0.004]$ .

Subsequent analyses relating to the interaction revealed that, among males with high baseline testosterone levels ( $+1 SD$ ;  $T \geq 234.4$  pg/ml), materialism scores were significantly higher in the intrasexual competition condition compared to those in the control condition,  $\beta = 1.12$ ,  $b = 1.12$ ,  $t = 3.98$ ,  $p < .001$ , 95 % CI  $[0.559, 1.679]$ . Conversely, for males with low baseline testosterone levels ( $-1 SD$ ;  $T \leq 121.6$  pg/ml), materialism scores were significantly lower in the intrasexual competition condition than in the control condition,  $\beta = -0.53$ ,  $b = -0.53$ ,  $t = -2.09$ ,  $p = .040$ , 95 % CI  $[-1.039, -0.026]$ . Among males with moderate *T* levels (mean = 178.0 pg/ml), there was no significant association between intrasexual competition and materialism,  $\beta = 0.29$ ,  $b = 0.29$ ,  $t = 1.57$ ,  $p = .121$ , 95 % CI  $[-0.079, 0.666]$ .

The results of the Johnson-Neyman analysis conducted on the full sample ( $N = 82$ ) further elucidated the interaction. Specifically, at

**Table 1**  
Descriptive statistics.

	Both conditions ( $N = 82$ )		Neutral condition ( $n = 37$ )		Intrasexual competition condition ( $n = 45$ )	
	M	SD	M	SD	M	SD
Age	23.7	2.8	23.6	2.7	23.7	3.0
Baseline testosterone (pg/ml)	178.0	56.4	160.3	50.5	192.5	57.3
Materialism	3.6	1.0	3.5	1.0	3.7	0.9

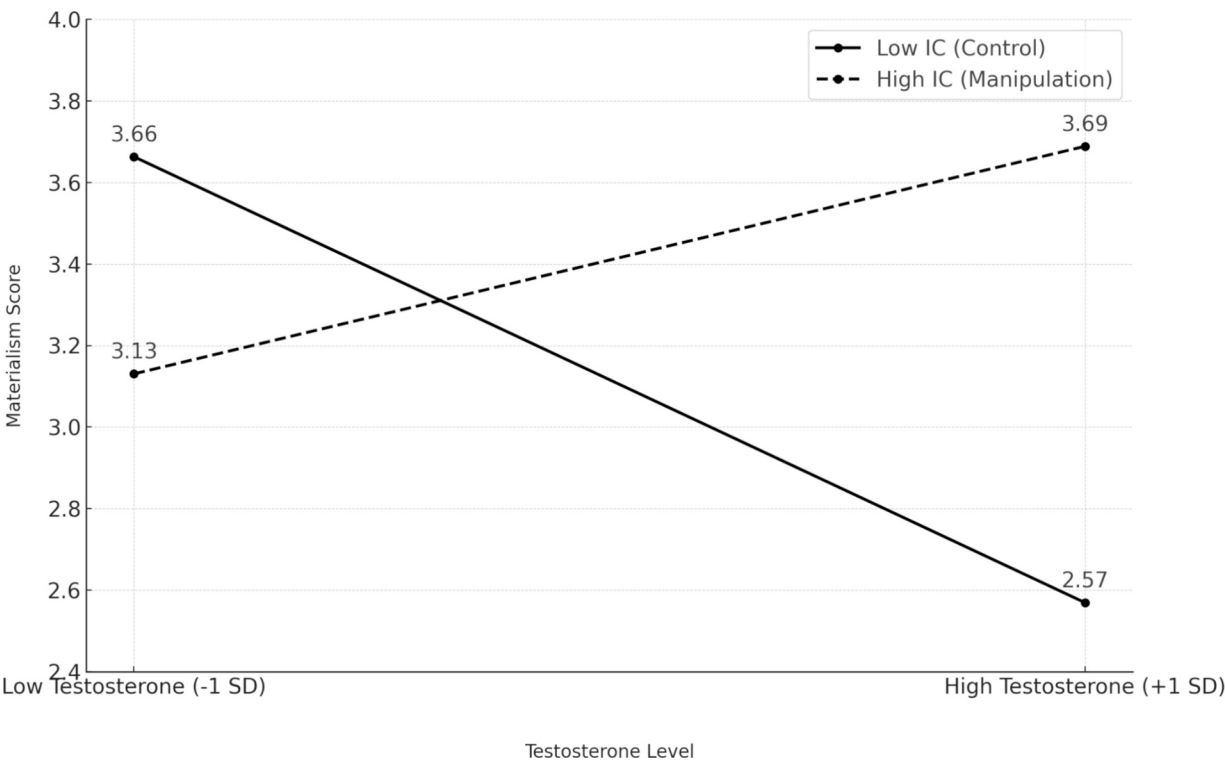


Fig. 1. The interaction between baseline testosterone and intrasexual competition on materialism.

testosterone levels of 125.5 pg/ml and lower (14.6 % of subjects), intrasexual competition had a significantly negative association with materialism,  $\beta = -0.63$ ,  $b = -0.55$ ,  $t = -1.99$ ,  $p = .050$ , 95 % CI [-1.091, 0.000]. Conversely, at testosterone levels of 190.2 pg/ml and higher (45.1 % of subjects), intrasexual competition had a significantly positive association with materialism,  $\beta = 0.49$ ,  $b = 0.43$ ,  $t = 1.99$ ,  $p = .050$ , 95 % CI [0.000, 0.757] (see Table 2 for complete results). It should be noted that these results are to be interpreted in the context of the testosterone levels observed in the current study (min = 59.0 pg/ml, max = 340.1 pg/ml).

**Table 2**  
Interaction between intrasexual competition prime and materialism across different baseline testosterone levels, analyzed using the Johnson-Neyman method.

Testosterone	Effect (b)	se	t	p	LLCI	ULCI
-118.9	-1.45	0.43	-3.38	0.001	-2.303	-0.594
-104.1	-1.23	0.38	-3.21	0.002	-1.998	-0.467
-89.3	-1.02	0.34	-2.98	0.004	-1.695	-0.336
-74.6	-0.80	0.30	-2.66	0.009	-1.396	-0.201
-59.8	-0.58	0.26	-2.22	0.029	-1.105	-0.056
-53.8	-0.49	0.25	-1.99	0.050	-0.990	0.000
-45.0	-0.37	0.23	-1.59	0.116	-0.823	0.092
-30.2	-0.15	0.20	-0.73	0.468	-0.556	0.258
-15.4	0.07	0.19	0.36	0.721	-0.309	0.444
-0.6	0.29	0.19	1.52	0.132	-0.087	0.657
5.8	0.38	0.19	1.99	0.050	0.000	0.757
14.2	0.50	0.20	2.53	0.013	0.107	0.895
29.0	0.72	0.22	3.26	0.002	0.280	1.156
43.8	0.93	0.25	3.73	0.000	0.436	1.434
58.6	1.15	0.29	4.01	0.000	0.580	1.723
73.4	1.37	0.33	4.19	0.000	0.717	2.018
88.2	1.58	0.37	4.29	0.000	0.849	2.320
102.9	1.80	0.41	4.35	0.000	0.978	2.625
117.7	2.02	0.46	4.39	0.000	1.103	2.933
132.5	2.23	0.51	4.42	0.000	1.227	3.242
147.3	2.45	0.55	4.43	0.000	1.350	3.553
162.1	2.67	0.60	4.44	0.000	1.472	3.865

4. Discussion

Although factors such as social influences, psychological traits, and cultural norms have been extensively studied in relation to materialism, the potential role of biological factors, such as testosterone, have received little attention. In the current research, we demonstrate that baseline testosterone and intrasexual competition interact to influence materialistic values. Specifically, as expected, we found that baseline testosterone was positively associated with materialism in the intrasexual competition condition. These findings extend our understanding of the link between testosterone and behavior by showing that baseline testosterone is not only associated with conspicuous consumption in men (Nave et al., 2018; Nepomuceno & Stenstrom, 2021), but is also associated with general values toward material possessions. While testosterone has been associated with status-signaling consumption as a reaction to intrasexual competition (Dinsmore et al., 2022; Nepomuceno & Stenstrom, 2021), there has been no research to date exploring the potential connection between testosterone, intrasexual competition, and materialistic values. The measure of materialism we adopted encompasses both status-signaling items as well as non-status-related values, such as how possessions are a central part of one's life and how acquiring possessions makes one happy. Our findings suggest that baseline testosterone levels, within intrasexually competitive contexts, not only encourage men to seek material possessions as a means of enhancing status and competing for mates, but also foster a view of possessions as central to one's life and as a source of personal happiness. Furthermore, our research underscores the role of the interplay between hormones and situational context (Carré & Archer, 2018) in influencing materialistic values.

Our results also show that, surprisingly, among males with low baseline testosterone levels, intrasexual competition was associated with lesser materialism. This unexpected relationship may be best understood in relation to the observed positive relationship between intrasexual competition and materialism among males with high baseline testosterone levels. We speculate that this could be ultimately due to the normativeness of males signaling their ability to procure resources as



a mating strategy (Griskevicius et al., 2007). In this sense, the lower materialism observed in the intrasexual competition condition among males with low baseline testosterone could be due to deference, such that they are essentially opting out of this specific mating strategy when faced with formidable intrasexual competitors. Investigating these possibilities could offer valuable avenues for future research.

Most extant research on materialism focuses on various correlates or outcomes of materialism. Other research explores how materialistic values are developed in children via family and cultural influences (Richins, 2017). Our finding that intrasexual competition is associated with greater materialistic values among males with high baseline testosterone levels adds to a growing body of research suggesting that materialism can be influenced by situational factors such as mortality salience (Kasser & Sheldon, 2000), disaster experiences (Jiang et al., 2021), social norms about materialism (Zhang & Hawk, 2022), and perceptions of social class (Li et al., 2018).

The limitations of the current research highlight potential avenues for future investigation. First, the single experiment reported herein would benefit from replication in studies using other types of samples (e. g., non-student) and larger sample sizes. Second, this study only included male subjects, which may appear to constrain the generalizability of our findings. However, the effect of testosterone differs markedly based on sex, and baseline testosterone, while also present in females, often appears to be less directly relevant to predicting responses in females (Archer, 2006; Carré et al., 2009; Carré et al., 2013). Thus, the generalizability of our findings may be inherently restricted to males. Nevertheless, while prior research suggests that baseline testosterone would not moderate the effect of intrasexual competition on materialism for females, the current research cannot directly speak to this. Future research investigating the role of hormones in predicting materialism in females could also consider testing the role of baseline estrogen, which is positively associated with assertiveness (Blake et al., 2017) and a preference for dominating others (Stanton & Schultheiss, 2007). Furthermore, feminized digit ratio (2D:4D), an indicator of a high prenatal estrogen-to-testosterone ratio, has been associated with materialism in response to intrasexual competition in females (Nepomuceno et al., 2021). Therefore, it remains an empirical question as to whether baseline estrogen would function similarly to testosterone or to indicators of prenatal estrogen when it comes to the relationship between intrasexual competition and materialism in females. Lastly, research suggest that the associations between baseline testosterone and status-related behavior can be modulated by cortisol levels. Specifically, some studies have found testosterone to be positively associated with aggression and risk-taking, but only among males with low baseline cortisol levels (Carré & Archer, 2018; Mehta et al., 2015). Thus, another avenue for future research may be to test if the association between baseline testosterone levels and materialism in highly competitive contexts are stronger among men with low baseline cortisol levels.

Our finding that, under the control conditions (i.e., low intrasexual competition), males with low baseline testosterone levels are more materialistic than those with high baseline testosterone, appears to draw some interesting parallels to the literature demonstrating that dominance and prestige represent distinct paths to social status (Cheng et al., 2013; Henrich & Gil-White, 2001). This research demonstrates that social status can be attained by way of aggression (the dominance path) or by earning the admiration and respect of others (the prestige path; Maner, 2017). Our results suggest that while males with high baseline testosterone levels typically focus on dominance, low-testosterone males may seek prestige via the materialistic accumulation of possessions. Thus, it could be interpreted that men with low testosterone levels may compensate via materialistic behaviors when intrasexual competition is low. However, they tend to avoid such behaviors when intrasexual rivalry is high, as their lower testosterone levels might disadvantage them in direct intrasexual competition. This reversal observed in our intrasexual competition condition raises some interesting questions for future research. For example, this may have been due to it being more

normative for males to compete for mates through status-related consumption in materialistic cultures. If so, cross cultural research including cultures where dominance and overt aggression are more accepted aspects of mate competition could offer valuable insights into when, why, and for whom prestige becomes the grounds for competition.

## CRedit authorship contribution statement

**Eric P. Stenstrom:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Marcelo V. Nepomuceno:** Writing – review & editing, Writing – original draft, Validation, Supervision, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Sean T. Hingston:** Writing – review & editing, Writing – original draft, Validation.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Data availability

Data will be made available on request.

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