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Testing the Mate Preference Priority Model with the Profile-Based Experimental Paradigm: A Replication and Extension

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Abstract

Objective:

Although the mate preference priority model (MPPM; Li et al., 2002) has advanced our understanding of mate preferences, tests of the MPPM have relied on methods using text labels and thus lack ecological validity. We address this gap by testing the MPPM using Townsend and colleagues' (1990a; 1990b; 1993) profile-based experimental paradigm, which utilizes profiles comprising photos of pre-rated models to manipulate physical attractiveness as well as costumes and descriptions to manipulate social status.

Method:

Using Singaporean samples, we conducted two studies (Study 1 $n = 431$, Study 2 $n = 964$) where participants judged the short-term and long-term mating desirability of opposite-sex profiles varying systematically on physical attractiveness and social status. We also tested whether treating these attributes as ordinal or continuous variables would be more valid.

Results:

Results showed broad support for evolutionary predictions of mate preferences and priorities while revealing an increased premium placed on social status in our sample. We also found that continuous operationalizations produced less inflated results.

Conclusions:

The current research provides the first non-label, profile-based test of the MPPM, a well-powered replication of the profile-based paradigm, and an opportunity to observe the robustness and variations of mate preferences in a non-Western culture.

Keywords: mate preferences, mate preference priority model, sex differences, culture, replication

"In this country, you gotta make the money first. Then when you get the money, you get the power, then you get the women." —Al Pacino, *Scarface*

"I don't understand how a woman can leave the house without fixing herself up a little—if only out of politeness. And then, you never know, maybe that's the day she has a date with destiny. And it's best to be as pretty as possible for destiny." —Coco Chanel

Introduction

Since time immemorial, people have been obsessively interested in the attributes that men and women want in romantic partners and the lengths they will go for them. This perennial drama has produced renderings and artifacts in every medium imaginable—from paintings to folktales to songs—suggesting the immense value conferred by women's physical attractiveness and men's power and resources (Fisher & Meredith, 2012; Gotschall et al., 2004). Beginning with marriage and family researchers (e.g., Hill, 1945) and continuing to evolutionary scholars (e.g., Buss & Schmidt, 1993; Shackelford et al., 2005), research has repeatedly shown that, consistent with cultural expressions, men value physical attractiveness (PA) in romantic partners more than do women, whereas women value resources and social status (SS) more than do men.

The present research builds on this body of knowledge by using Townsend et al.'s (1990a; 1990b; 1993) profile-based experimental paradigm to test not only the classic results in mate preferences, but also the more recent findings of the mate preference priority model (MPPM; Li et al., 2002; Li & Kenrick, 2006). As we elaborate in later sections, the MPPM has advanced our understanding of mate preferences by highlighting *within*-sex differences: people prioritize having a minimum level of critical attributes when seeking mates. However, as tests of the MPPM have extensively relied on the "budget allocation" task which uses abstract text labels (e.g., "physically attractive", "good earning capacity") to represent attributes, the limited use of alternative approaches raises concerns over the ecological validity of the findings (Li & Meltzer, 2015; Townsend & Levy, 1990a), as well as whether the findings are merely an artifact of this method.[1] By adopting Townsend and colleagues' method, which utilizes realistic profiles of target individuals that systematically differ in PA and SS to assess people's preferences, our study addresses the limitations of MPPM research and provides a novel and more ecologically significant test of mate preference theories. Moreover, we note the lack of applications of the profile-based method beyond Western samples as well as recent

findings suggesting important cultural differences underlying mate preferences (Chang et al., 2011; Yong et al., 2019), and hence we sought to replicate this method using a culturally distinct East Asian sample. In so doing, the current research makes several important contributions, including a novel test of the MPPM using a more ecologically valid paradigm, a replication of Townsend and colleagues' research, and an examination of mate preferences using a non-Western sample.

Mate Preferences from an Evolutionary Perspective

From an evolutionary perspective, mate preferences evolved to guide individuals to choose reproductively viable mates, and sex-differentiated preferences stem from differences between men's and women's fertility timespans and minimum obligatory contributions to reproduction (Symons, 1979). Specifically, men evolved to find physical cues to fertility (i.e., youth, sexual maturity) especially attractive, whereas women evolved to more strongly value SS given its instrumentality for resource acquisition (Buss & Schmitt, 1993). Ancestral humans who sought these attributes in their partners achieved greater reproductive success, thereby passing on the genes that code for these preferences to later generations and resulting in the mate preferences we see today (see Crawford, 1998 for fuller discussions).

These sex-differentiated preferences further vary as a function of relationship context. When seeking mates who are not anticipated to commit to the relationship, women may have evolved to disregard resources and SS and instead prioritize PA (marked by muscularity and body symmetry) as a signal of good genes (Li & Kenrick, 2006). Indeed, studies show that for long-term relationships, women (versus men) place higher value on SS in potential mates whereas men (versus women) place higher value on PA (Buss & Schmitt, 1993), while for short-term relationships, women's preferences converge with men's to value PA over SS whereas men continue to strongly value PA (Thomas et al, 2020).

The Mate Preference Priority Model and the Budget-Allocation Methodology

The MPPM extends what we know about mate preferences by emphasizing the minimum levels of critical attributes that people prioritize in prospective partners (Li et al., 2002; Li et al., 2013), thus highlighting not only *between-sex* differences but also *between-attribute* differences occurring *within individuals*. If a woman's PA indicates her level of fertility—a quality that is essential for reproduction (Buss & Schmitt, 1993)—then it would be adaptive for men to prioritize at least a

moderate level of PA in any relationship context *before* considering other attributes. Likewise, if a man's SS indicates his ability to have resources that were critical to survival in ancestral times, then it would be adaptive for women to prioritize in their long-term mates a moderate level of SS *before* considering other attributes. As a steady flow of resources is less relevant in short-term contexts, women might benefit more from having a short-term partner with good genes. Therefore, although women prioritize SS in long-term mates, they may have evolved to prioritize a moderate level of PA for short-term partners. Attributes that are critical and thus prioritized are termed *necessities*, whereas attributes that contribute to overall desirability but are acquired only after necessities have been obtained are termed *luxuries*.

As traditional survey methods cannot effectively elucidate such priorities, Li and colleagues (2002) devised a budget allocation methodology to differentiate which attributes are considered necessities versus luxuries in the trade-offs that people make between attributes. Specifically, participants are presented with a list of attribute terms or labels (e.g., PA, SS, kindness, industriousness, creativity) and given a limited number of mate dollars or percentile points that they allocate to those attributes to construct their ideal mate. When given a low budget for long-term relationships, men prioritized PA whereas women prioritized SS (Li et al., 2002); for short-term relationships, both men and women prioritized PA over SS (Li & Kenrick, 2006). As budgets grew, sex differences in the long-term context generally disappeared and participants allocated more points to luxury attributes. The MPPM has been supported by replications and extensions using this methodology (e.g., Mogilski et al., 2014; Thomas et al., 2020) and, by examining priorities, was instrumental in resolving a paradox in the literature whereby PA and SS—the seemingly most important attributes from both evolutionary and sociocultural perspectives on mating (Howard et al., 1987)—never featured at the top of people's ratings or rankings (Li et al., 2002). Moreover, the broad utility of the budget-allocation task has been demonstrated by studies that examined priorities in non-romantic relationship contexts, including leaders (Nichols & Cottrell, 2014), employees (Jonason et al., 2014), and friends (Lewis et al., 2012). An overview of studies that have examined priorities with the budget allocation method across mating and other domains is provided in Appendix A.

Despite the merits of the budget-allocation task, the MPPM has so far been tested almost exclusively with this single method that, like most other mate preference studies, uses text labels to

represent attributes. Although these labels are typically well defined and accompanied by examples, such surveys carry a low degree of realism and may rely on cognitive processes residing outside of the preferences hypothesized to have evolved to guide mate selection (Townsend & Roberts, 1993). As some critiques have argued, the reliance on abstract labels may represent "cold" or artificial stimuli that speak mainly to participants' conscious notions of desired preferences (e.g., a priori theories and stereotypes; cf., Li et al., 2013; Li & Meltzer, 2015; Meltzer et al., 2014b). Thus, short of presenting realistic stimuli that overcomes participants' tendencies to choose based on what is socially desired, we cannot be sure if studies that purportedly tested the MPPM truly tapped into evolved preferences.

An Ecologically Valid Extension of Mate Preference Priorities

To facilitate an investigation of mate preference priorities that extends beyond the use of attribute labels, we employed the profile-based experimental paradigm designed by Townsend et al. (1990a; 1990b; 1993). In this now-classic design, experimental stimuli consist of three male photographs and three female photographs: one of each depicting low, moderate, and high PA, and three realistic descriptions: one of each conveying three different levels of SS (working, middle, and upper-middle class). Participants viewed opposite-sex target profiles made up of these photographs and descriptions in a 3 × 3 factorial design and rated their interest in the target individuals across different stages of romantic relations, including short-term sex and long-term marriage. Using this approach, Townsend and colleagues observed sex-differentiated preferences for both partner PA and partner SS that corresponded with evolutionary predictions of mate preferences. These findings were later replicated using other manipulations of SS such as clothes (Townsend & Levy, 1990b) and social archetypes (Townsend, 1993).

This paradigm represented a major step forward for mate preference research because of its vivid and realistic depictions of potential mates. Yet, despite the increasingly popular usage of profiles in studies of people's judgments across a variety of domains (e.g., Lee et al., 2014; Tornquist & Chiappe, 2015), the profile-based approach is lamentably underutilized in mate preference research. To our knowledge, only two studies conducted in the Netherlands have used it to investigate the differential effects of PA and SS in mate choice (Ha et al., 2010; 2012), albeit with design modifications and specific research foci that limit the extent to which they can be considered

replications.

Furthermore, the profile-based approach has not been tested on samples beyond the West. This research gap is especially significant against the backdrop of evidence for heightened valuation of SS in East Asian culture. For instance, studies have shown that, relative to people from other cultures, East Asian individuals demonstrate higher materialism (Li et al., 2011), concern for occupational prestige (Yong et al., 2019), and association between SS and self-worth (Twenge & Campbell, 2002). These findings suggest that in contrast with standard mate preference findings and an evolutionary perspective espousing sex-differentiated preferences, both men and women in East Asian cultures may equally value SS as an indispensable attribute. Thus, testing the profile-based approach in an East Asian context will allow us to assess the cross-cultural generalizability of Townsend and colleagues' results while testing the key finding that women, but not men, evolved to value SS as a necessity.

Perhaps most crucially, despite the utility of the profile-based paradigm as an ecologically valid platform, the lack of ecological tests of the MPPM, and the centrality of the concept of trade-off thresholds in both lines of work (Townsend, 1993; Li et al., 2002), the profile-based paradigm and the MPPM have surprisingly not been researched in conjunction. In particular, the profile-based paradigm has not yet been utilized to examine mate preference priorities. Considering these various issues highlighted, a test of the MPPM using the profile-based methodology on an East Asian sample addresses two major developments in mate preference research and constitutes a timely endeavor to tackle several major gaps.

Overview of Hypotheses and Investigation

Our investigation proceeded in two parts. To replicate the profile-based paradigm, we first tested three sets of basic, evolutionarily guided mate preference hypotheses (Buss & Schmitt, 1993; Li et al., 2002):

For long-term mating, we hypothesized that (1a) PA (versus SS) more strongly impacts men's ratings of potential mates' desirability whereas (1b) SS (versus PA) more strongly impacts women's ratings. We also hypothesized that (1c) PA more strongly impacts men's (versus women's) ratings whereas (1d) SS more strongly impacts women's (versus men's) ratings.

For short-term mating, we hypothesized that PA (versus SS) more strongly impacts both (2a)

men's and (2b) women's ratings of potential mates' desirability, though we also hypothesized that (2c) PA more strongly impacts men's (versus women's) ratings whereas (2d) SS more strongly impacts women's (versus men's) ratings.

Comparing across long-term and short-term contexts, we hypothesized that PA more strongly impacts both (3a) men's and (3b) women's ratings for short-term (versus long-term) mates. Likewise, we hypothesized that SS more strongly impacts both (3c) men's and (3d) women's ratings for long-term (versus short-term) mates.

Next, we derived two sets of hypotheses from the MPPM for necessities (Li et al., 2002), which predict a concave pattern of diminishing marginal utility for such attributes as they are valued highly at low levels, but incrementally less as attribute level rises and exceeds minimum requirements. Specifically, for long-term mating, we hypothesized that PA (4a) is a necessity to men but (4b) not women, and we hypothesized that SS (4c) is not a necessity to men but (4d) is to women. For short-term mating, we hypothesized that PA (5a) is a necessity to men and (5b) to women, and that SS (5c) is not a necessity to men or (5d) to women. These basic mate preference and priorities hypotheses are summarized in Table 1.

Considering the complex interaction analyses required to test these hypotheses, two independent studies were conducted to increase confidence in the validity of our findings. Both studies utilized East Asian samples represented by Singaporean participants, who were instructed to look at profiles of individuals varying in PA and SS to and rate their long-term and short-term romantic desirability. From these ratings, we could determine which attributes more strongly impacted the desirability perceptions of men versus women and how those attributes were prioritized across relationship contexts. Furthermore, in Study 2, we conducted an a priori power analysis to ensure that our sample was large enough to accommodate the complex analyses.

One notable shortcoming of the existing MPPM literature is that most studies have examined necessities and ignored luxuries (e.g., Lewis et al., 2012; Mogilski et al., 2014; Thomas et al., 2020). Importantly, attributes that test null for necessities are not automatically luxuries; in theory, a luxury attribute should show increasing marginal utility and hence be tested for in a reverse manner to that of necessities. As the profile-based design allows for such a test of luxuries, the current work therefore makes another contribution to MPPM research; however, we did not derive a set of formal hypotheses

given the exploratory nature of this analysis.

Study 1

Study 1 employed a mixed, four-factor factorial design consisting of one between-subject independent variable (participant sex: male, female), three within-subject factors (attribute type: PA, SS; attribute level: low, moderate, high; mating context: short-term, long-term), and one dependent variable (desirability).

To build on Townsend and colleagues' work, we followed their design but instated three enhancements. First, rather than assessing participants' willingness to engage in short-term or long-term relations with the opposite-sex targets in the presented profiles, we asked participants to indicate the desirability of each target as a short-term and long-term mate. This modification allowed us to avoid any potential prejudices that participants may have toward casual or committed relationships (Moon et al., 2020), which may bias their views toward the targets. Second, we concurrently employed two originally separate approaches used by Townsend and Levy (1990a, 1990b). Specifically, we provided descriptions that emphasized varying levels of SS (e.g., education, profession, hobbies, ambitiousness) in a sex-neutral manner (Townsend & Levy, 1990a) and ensured that all targets adorned clothing signifying different levels of SS in the photographs (Townsend & Levy, 1990b), thereby increasing the realism of the profiles as each target's clothing corresponded with their description (e.g., a laid-back technical-school graduate working at a fast food diner dressed in a simple t-shirt; an ambitious corporate high-flyer dressed in a suit). Finally, we used two operationalizations of PA and SS: as an *ordinal variable*—discrete attribute levels (low, moderate, high), which follows the approach taken by Townsend and colleagues as well as past research using the budget-allocation method, and as a *continuous variable*—participants' perceptions of the attributes obtained through manipulation checks. This last modification allowed us to see if the hypothesized effects are corroborated via participant perceptions and to gain insights into which approach might be better when operationalizing constructs in future research.

Method

Participants

A total of 431 undergraduate participants (M_{age} = 22.04 years, SD_{age} = 1.72, 53.4% females) from a large Singapore university enrolled in exchange for course credits. This sample is larger than

the recommended sample size (n = 368) based on the small-to-medium effect size demonstrated in past research ($\eta_p^2 \approx 0.21$; Ha et al., 2012) and power = .80.

Materials and Procedure

As per the profile-based method, we created profile combinations of fictitious individuals that comprised a photograph and corresponding description, resulting in a total of 18 profiles varying factorially by sex (2: male, female), attribute PA (3: low, moderate, high), and attribute SS (3: low, moderate, high). To manipulate three levels of attribute PA per sex, pre-rated photographs were used and manipulation checks (7-point scale) further confirmed that participants perceived the photographs to differ on three levels of PA (male targets: M_{low} = 1.83, SD_{low} = 0.12, $M_{moderate}$ = 3.82, $SD_{moderate}$ = 0.11, M_{high} = 5.42, SD_{high} = 0.11, $F(2,314.03) = 238.48$, $p < .001$; female targets: M_{low} = 1.75, SD_{low} = 0.12, $M_{moderate}$ = 4.02, $SD_{moderate}$ = 0.12, M_{high} = 5.96, SD_{high} = 0.11, $F(2,244.65) = 334.45$, $p < .001$). To manipulate three levels of attribute SS per sex, we concurrently employed two approaches used by Townsend and Levy (1990a, 1990b). Specifically, we provided descriptions that emphasized varying levels of SS (e.g., education, profession, hobbies, ambitiousness) in a sex-neutral manner (Townsend & Levy, 1990a) and ensured that all targets wore clothing signifying different levels of SS in the photographs (Townsend & Levy, 1990b), thereby increasing the realism of the profiles as each target's clothing corresponded with their description (e.g., a laid-back technical-school graduate working at a fast food diner dressed in a simple t-shirt; an ambitious corporate high-flyer dressed in a suit). Manipulation checks (7-point scale) confirmed that participants perceived the descriptions to differ on three levels of SS (male targets: M_{low} = 1.75, SD_{low} = 0.09, $M_{moderate}$ = 4.03, $SD_{moderate}$ = 0.09, M_{high} = 6.35, SD_{high} = 0.09, $F(2,349.33) = 602.19$, $p < .001$; female targets: M_{low} = 2.03, SD_{low} = 0.13, $M_{moderate}$ = 4.08, $SD_{moderate}$ = 0.13, M_{high} = 6.16, SD_{high} = 0.13, $F(2,304.38) = 248.60$, $p < .001$). Readers who are interested to view these stimuli may contact the first author.

We programmed the profiles to display on Qualtrics so that participants would only view three randomly chosen opposite-sex profiles and that the profile combinations would always include all three levels of PA and all three levels of SS without repetition for each attribute level.[2] All participants were situated separately in private booths in the laboratory. After providing informed consent, participants viewed the profiles and indicated how desirable they perceived each target to be as a (a) short-term mate and (b) long-term mate (1 = *very undesirable*; 7 = *very desirable*). Upon

completion, we debriefed all participants.

Results

Men's and Women's Long- and Short-Term Mate Preferences

Given that both short- and long-term desirability ratings of multiple targets varying in both PA and SS were nested within participants, we used the mixed model function in SPSS 26 to examine the effects of PA and SS on men's and women's perceptions of short- and long-term target desirability. Specifically, we regressed participants' desirability ratings onto their biological sex (coded as male = -1 and female = 1), the relationship context (coded as -1 = short-term and 1 = long-term), the target attribute (coded as -1 = PA and 1 = SS), the attribute level (operationalized as an ordinal variable: discrete attribute levels coded as -1 = low, 0 = moderate, and 1 = high, and as a continuous variable: participants' perceptions of each target's PA and SS using a 7-point scale), and all possible 2-, 3-, and 4-way interactions, and we allowed the intercept and attribute level estimates to vary across participants. We report both the overarching interactions and the specific tests for each individual hypothesis. The four-way interaction between all variables was not significant in the model using discrete attribute levels, $b = 0.04$, 95% Confidence Interval ($CI_{95\%}$) [-0.02: 0.10], $t(1359.80) = 1.27$, $p = .205$, but was significant in the model using participants' perceptions of each target's attributes, $b = 0.06$, $CI_{95\%}$ [0.01: 0.11], $t(1598.11) = 2.22$, $p = .027$, effect-size $r = .06$. Given our specific predictions regarding simple interactions and effects within this broader model, we continued to test those predictions.

Long-term preferences. To test Hypotheses 1a-1d (men's and women's relative attribute preferences for a long-term mate), we used test subcommands to estimate the simple interactions of interest within the full four-way factorial model (this approach also helps to prevent an increase in Type I error; Aiken et al., 1991). The interaction patterns for long-term preferences are graphically displayed in Figure 1 (Panels A and B).

To test whether PA versus SS more strongly impacted men's ratings of target long-term desirability, we examined the simple Attribute Type × Attribute Level interaction among men; it was not significant (using the discrete attribute levels: $b = 0.11$, $CI_{95\%}$ [-0.02: 0.25], $t(839.66) = 1.72$, $p = .106$; using participants' perceptions of attribute levels: $b = 0.01$, $CI_{95\%}$ [-0.10: 0.11], $t(913.59) = 0.15$, $p = .884$). As indicated in the left half of Table 2, there was no significant difference between

PA and SS in the impact of female target attribute level on men's ratings of target long-term desirability. Hence, Hypothesis 1a was not supported. For women's ratings, however, there was a significant simple Attribute Type × Attribute Level interaction (discrete attribute levels: $b = 0.62$, $CI_{95\%}$ [0.49: 0.76], $t(875.72) = 9.25$, $p < .001$, effect-size $r = .30$; participants' perceptions of attribute levels: $b = 0.30$, $CI_{95\%}$ [0.19: 0.41], $t(945.58) = 5.48$, $p < .001$, effect-size $r = .18$). As indicated in the left half of Table 2, male target attribute level had a stronger impact on women's ratings of target long-term desirability when the target attribute was SS (versus PA), thus supporting Hypothesis 1b.

To test whether PA had a stronger impact on men's versus women's judgments of target long-term desirability, the simple Sex × Attribute Level interaction for PA was examined and found to be significant (discrete attribute levels: $b = -0.29$, $CI_{95\%}$ [-0.45: -0.13], $t(589.49) = -3.59$, $p < .001$, effect-size $r = .15$; participants' perceptions of attribute levels: $b = -0.18$, $CI_{95\%}$ [-0.32: -0.05], $t(726.71) = -2.72$, $p < .001$, effect-size $r = .10$). As seen in the left half of Table 2, target PA more strongly impacted men's (versus women's) judgments of target long-term desirability, thus supporting Hypothesis 1c. For SS, the simple Sex × Attribute Level interaction was also significant (discrete attribute levels: $b = 0.22$, $CI_{95\%}$ [0.08: 0.37], $t(632.71) = 3.04$, $p = .002$, effect-size $r = .12$; participants' perceptions of attribute levels: $b = 0.11$, $CI_{95\%}$ [0.002: 0.221], $t(658.97) = 2.01$, $p = .045$, effect-size $r = .08$). As seen in the left half of Table 2, target SS more strongly impacted women's (versus men's) judgments of target long-term desirability, thus supporting Hypothesis 1d.

Short-term preferences. To test Hypotheses 2a-2d (men's and women's relative attribute preferences for a short-term mate), we again used test subcommands to determine the simple interactions within the full four-way factorial model. The results for short-term preferences are shown in Figure 1 (Panels C and D).

To test whether PA or SS impacts men's ratings of target short-term desirability more, the simple Attribute Type × Attribute Level interaction for men was examined and found to be significant (discrete attribute levels: $b = -0.59$, $CI_{95\%}$ [-0.72: -0.46], $t(804.38) = -8.87$, $p < .001$, effect-size $r = .30$; participants' perceptions of attribute levels: $b = -0.43$, $CI_{95\%}$ [-0.54: -0.34], $t(921.07) = -8.56$, $p < .001$, effect-size $r = .27$). As the right half of Table 2 shows, female target attribute level had a greater impact on men's short-term desirability ratings when the target attribute was PA (versus SS), thus supporting Hypothesis 2a. For women's ratings of target short-term desirability, the simple Attribute

Type × Attribute Level interaction was also significant (discrete attribute levels: b = -0.24, $CI_{95\%}$ [-0.37: -0.11], t(840.66) = -3.74, p < .001, effect-size r = .13; participants' perceptions of attribute levels: b = -0.37, $CI_{95\%}$ [-0.47: -0.27], t(1008.81) = -7.25, p < .001, effect-size r = .22). As shown in the right half of Table 2, male target attribute level had a greater impact on women's short-term desirability ratings when the target attribute was PA (versus SS), thus supporting Hypothesis 2b.

Testing the impact of PA on men's versus women's ratings of target short-term desirability revealed a significant simple Sex × Attribute Level interaction for PA (discrete attribute levels: b = -0.27, $CI_{95\%}$ [-0.40: -0.14], t(461.47) = -4.08, p < .001, effect-size r = .19; participants' perceptions of attribute levels: b = -0.11, $CI_{95\%}$ [-0.21: -0.01], t(490.13) = -2.15, p = .032, effect-size r = .10). As the right half of Table 2 shows, target PA more strongly impacted men's (versus women's) ratings of target short-term desirability, thus supporting Hypothesis 2c. For SS, the simple Attribute Type × Attribute Level interaction was not significant (discrete attribute levels: b = 0.09, $CI_{95\%}$ [-0.07: -0.25], t(745.17) = 1.06, p = .291; participants' perceptions of attribute levels: b = -0.04, $CI_{95\%}$ [-0.17: 0.08], t(784.11) = -0.65, p = .519). As seen in the right half of Table 2, target SS similarly impacted women's and men's ratings of target short-term desirability. Hence, Hypothesis 2d was not supported.

Long-term versus short-term preferences. To test Hypotheses 3a-3d (long-term versus short-term mating), we again used test subcommands to determine the simple interactions within the full four-way factorial model. In testing whether PA had a greater impact on men's ratings of target long-term versus short-term desirability, the simple Mating Context × Attribute Level for PA among men was significant (discrete attribute levels: b = -0.38, $CI_{95\%}$ [-0.50: -0.27], t(580.55) = -6.44, p < .001, effect-size r = .26; participants' perceptions of attribute levels: b = -0.24, $CI_{95\%}$ [-0.34: -0.15], t(817.05) = -5.03, p < .001, effect-size r = .17). As shown in Table 2, target PA had a greater impact on men's judgments of female short-term (versus long-term) desirability. Conversely, a significant Mating Context × Attribute Level interaction for partner SS (discrete attribute levels: b = 0.32, $CI_{95\%}$ [0.19: 0.45], t(883.73) = 4.82, p < .001, effect-size r = .16; participants' perceptions of attribute levels: b = 0.20, $CI_{95\%}$ [0.10: 0.30], t(861.95) = 3.83, p < .001, effect-size r = .13) reflected that SS had a stronger impact on men's judgments of female long-term (versus short-term) desirability. Hence, Hypotheses 3a and 3c were supported.

For PA among female raters, the Mating Context × Attribute Level interaction was also

significant (discrete attribute levels: b = -0.41, $CI_{95\%}$ [-0.52: -0.29], t(618.68) = -6.94, p < .001, effect-size r = .27; participants' perceptions of attribute levels: b = -0.32, $CI_{95\%}$ [-0.42: -0.22], t(859.34) = -6.18, p < .001, effect-size r = .21). As Table 2 shows, PA more strongly impacted women's judgments of short-term (versus long-term) desirability. Conversely, a significant Mating Context × Attribute Level interaction for partner SS (discrete attribute levels: b = 0.46, $CI_{95\%}$ [0.34: 0.58], t(853.16) = 7.34, p < .001, effect-size r = .24; participants' perceptions of attribute levels: b = 0.35, $CI_{95\%}$ [0.26: 0.45], t(855.01) = 7.16, p < .001, effect-size r = .24) reflected that target SS more strongly impacted women's judgments of male long-term (versus short-term) desirability, thus supporting Hypotheses 3b and 3d.

Mate Preference Priorities

Necessity attributes evince diminishing marginal benefits: the extent to which low (and thus inadequate) levels of a necessary attribute (versus a sufficient, moderate amount) hurt a mate's overall desirability is more than the extent to which high (versus moderate) levels of the attribute help desirability. A necessity requires a combination of a positive linear effect and a negative quadratic effect of attribute on desirability, which shows an overall trend of a positive increase that slows down at the higher values of the predictor. Thus, to test for necessities, we looked for both a positive linear and a negative quadratic effect of attribute level (Li et al., 2002).

Although neither target PA nor SS has been previously hypothesized to be a luxury, the current paradigm nonetheless allows us to examine evidence of luxuries. Luxury attributes (1) show increasing marginal utility such that going from a moderate to high level of such an attribute increases target desirability more than going from a low to moderate level does (Li et al., 2002, Study 3) and (2) are not initially prioritized but become so once necessities have been sufficiently acquired. Importantly, attributes that test null for necessities are not automatically classified as luxuries; instead, luxuries are statistically tested for in reverse to necessities—they should not be the highest valued traits at low budgets but are increasingly valued as budgets grow. Thus, we examined luxuries by testing for both positive linear and quadratic effects of attribute level on desirability. Given the two-trait design, our study also provides a novel examination of luxuries by testing whether, when a hypothesized necessity's attribute level is high (rather than low), the other trait makes a larger impact on target desirability.[3]

Marginal utility analyses. We conducted marginal utility analyses using mixed modeling in SPSS 26 to account for the nested nature of our data. Specifically, two-level models were used where target ratings were nested within participants. These linear versus quadratic results are illustrated in Figure 2 (Panels A and B for long-term preferences and Panels C and D for short-term preferences).

Long-term mates. To examine the extent to which men and women considered target PA a necessity versus a luxury in a long-term mate, we regressed participants' ratings of target long-term desirability onto target attribute level and a quadratic coefficient of attribute level (Attribute Level × Attribute Level). Notably, we conducted this model four times: on male participants using 1) the discrete attribute levels and 2) their perceptions of attribute levels, and on female participants using 3) the discrete attribute levels and 4) their perceptions of attribute levels. As shown in the left half of Table 3, men's preference for PA in a long-term mate had a significant positive linear effect and a negative quadratic effect when using the discrete attribute levels but not when using men's perceptions of attribute levels ($p = .467$). Therefore, we re-estimated this latter model excluding the quadratic coefficient, which revealed a linear association. Women's preference for PA in a long-term mate did not have a significant negative quadratic effect (discrete attribute levels: $p = .286$; women's perceptions of attribute levels: $p = .395$) and thus we re-estimated both models excluding the quadratic coefficient; both models revealed significant positive linear effects. Hence, our results partially confirm that PA is a necessity to men (Hypothesis 4a) and fully confirm that PA is not a necessity to women (Hypothesis 4b) when judging long-term mates.

To examine the extent to which men and women considered target SS a necessity versus a luxury in a long-term mate, we regressed participants' ratings of target long-term desirability onto target attribute level and a quadratic coefficient of attribute level. We again ran this model four times. Results showed that men's preference for SS in a long-term mate had a significant positive linear effect and negative quadratic effect when using the discrete attribute levels, but not when using men's perceptions of attribute levels ($p = .350$); therefore, this latter model was re-estimated with the quadratic coefficient excluded, which revealed a linear effect. Women's preference for SS in a long-term mate demonstrated a significant positive and significant negative quadratic effect using both operationalizations of attribute level. Here, our results partially confirm that SS is not a necessity to men (Hypothesis 4c) and fully confirm that SS is a necessity to women (Hypothesis 4d) when judging

long-term mates.

Short-term mates. To examine the extent to which men and women considered target PA a necessity versus a luxury in a short-term mate, we regressed participants' ratings of target short-term desirability onto attribute level and a quadratic coefficient of attribute level. This model was again conducted four times. As shown in the right half of Table 3, men's preference for PA in a short-term mate had a significant positive linear effect and negative quadratic effect when using the discrete attribute levels, but not when using men's perceptions of attribute levels (p = .277); hence, this latter model was re-estimated excluding the quadratic coefficient, which revealed a linear association. Similar to their preference for PA in a long-term mate, women's preference for PA in a short-term mate did not have a significant quadratic effect (discrete attribute levels: p = .561; women's perceptions of attribute levels: p = .204), so we re-estimated both models excluding the quadratic coefficient; both models revealed significant positive linear effects. These results partially confirm that PA is a necessity to men (Hypothesis 5a) but do not confirm that partner PA is a necessity to women (Hypothesis 5b) when judging short-term mates.

To examine the extent to which men and women considered target SS a necessity versus a luxury in a short-term mate, we regressed participants' ratings of target short-term desirability onto attribute level and a quadratic coefficient of attribute level. Once more, we conducted this model four times. Results demonstrated that neither men's nor women's preference for SS in a short-term mate had a significant diminishing quadratic effect (men using the discrete attribute levels: p = .331; men using their perceptions of attribute levels: p = .714; women using the discrete attribute levels: p = .953; women using their perceptions of attribute levels: p = .995). Thus, we re-estimated all models excluding the quadratic coefficients. As all models revealed significant positive linear effects, our results fully confirm that partner SS is not a necessity to both men and women (Hypotheses 5c and 5d) when judging short-term mates.

Evidence for luxuries in interactive effects. No initial evidence was found in the above analyses that either attribute constituted a luxury in either mating context for either sex. However, given that luxuries theoretically only add value once necessities have been sufficiently acquired, we examined whether the impact of a potential luxury attribute on men's and women's short- and long-term desirability is stronger when a necessity attribute is high rather than low. To test this, we

regressed participants' ratings of target desirability onto target PA, SS, and the PA × SS interaction. We again used mixed modeling to account for the fact that participants rated multiple targets and conducted this model eight times to examine (1-2) women's ratings of male long-term desirability (i.e., whether the impact of male PA is greater at high versus low levels of male SS) using both operationalizations of attribute levels, (3-4) women's ratings of male short-term desirability (i.e., whether the impact of male SS is greater at high versus low levels of male PA) using both operationalizations of attribute levels, and men's ratings of female (5-6) long- and (7-8) short-term desirability (i.e., whether the impact of female SS is greater at high versus low levels of female PA) using both operationalizations of attribute levels.

Results demonstrated that target PA and target SS interacted to predict women's judgments of both long- and short-term desirability of males (for long-term desirability using the discrete attribute levels: $b = 0.41$, $CI_{95\%}$ [0.20: 0.63], $t(281.35) = 3.73$, $p < .001$, effect-size $r = .22$; for long-term desirability using women's perceptions of attribute levels: $b = 0.23$, $CI_{95\%}$ [0.10: 0.36], $t(322.60) = 3.41$, $p = .001$, effect-size $r = .19$; for short-term desirability using the discrete attribute levels: $b = 0.29$, $CI_{95\%}$ [0.05: 0.53], $t(295.32) = 2.34$, $p = .020$, effect-size $r = .13$; for short-term desirability using women's perceptions of attribute levels: $b = 0.17$, $CI_{95\%}$ [0.04: 0.29], $t(346.30) = 2.57$, $p = .011$, effect-size $r = .14$). In long-term contexts, the impact of target PA was greater at high levels of SS (discrete attribute levels: $t(291.44) = 7.33$, $p < .001$; women's perceptions of attribute levels: $t(321.90) = 8.34$, $p < .001$) than at low levels of SS (discrete attribute levels: $t(281.99) = 0.94$, $p = .350$; women's perceptions of attribute levels: $t(320.73) = 3.41$, $p = .001$). In short-term contexts, the impact of SS was greater at high levels of PA (discrete attribute levels: $t(272.36) = 9.03$, $p < .001$; women's perceptions of attribute levels: $t(332.04) = 7.55$, $p < .001$) compared to low levels of PA (discrete attribute levels: $t(349.91) = 4.70$, $p < .001$; women's perceptions of attribute levels: $t(343.16) = 4.53$, $p < .001$).

Results additionally demonstrated that the impact of target SS on men's judgments of female long-term desirability depends on the level of PA (discrete attribute levels: $b = 0.41$, $CI_{95\%}$ [0.16: 0.66], $t(266.00) = 3.23$, $p = .001$, effect-size $r = .19$; men's perceptions of attribute levels: $b = 0.29$, $CI_{95\%}$ [0.16: 0.42], $t(299.75) = 4.33$, $p < .001$, effect-size $r = .24$), such that the impact of SS is greater at high levels of PA (discrete attribute levels: $t(247.41) = 9.66$, $p < .001$; men's perceptions of

attribute levels: $t(301.13) = 10.93$, $p < .001$) than at low levels of PA (discrete attribute levels: $t(303.73) = 4.78$, $p < .001$; men's perceptions of attribute levels: $t(300.04) = 5.63$, $p < .001$). In contrast, however, the impact of SS on men's ratings of female short-term desirability was independent of the level of PA (discrete attribute levels: $b = 0.10$, $CI_{95\%}$ [-0.11: 0.32], $t(248.79) = 0.96$, $p = .339$; men's perceptions of attribute levels: $b = -0.02$, $CI_{95\%}$ [-0.13: 0.09], $t(295.33) = -0.31$, $p = .760$). Hence, based on this analytical approach, women consider PA a luxury in long-term contexts and SS a luxury in short-term contexts; men consider female SS a luxury in long-term contexts.

Discussion

Study 1 provided support for a majority of the evolutionary predictions of basic mate preferences, with two exceptions: PA did not have a greater impact than SS on men's judgments of long-term mates (Hypothesis 1a) and SS did not have a greater impact on women's judgments of short-term mates than on men's judgments (Hypothesis 2d). As expected by the MPPM, women judging long-term mates treated SS as a necessity (Hypothesis 4d) but not PA (Hypothesis 4b), while SS was not a necessity in short-term mates for either men (Hypothesis 5c) or women (Hypothesis 5d). The predictions that men treat PA as a necessity when judging long-term (Hypothesis 4a) and short-term mates (Hypothesis 5a), whereas men do not treat SS as a necessity when judging long-term mates (Hypothesis 4c), were supported only when using discrete attribute levels. Against expectations, women did not treat PA as a necessity when judging short-term mates (Hypothesis 5b). The second set of more nuanced priority analyses, however, revealed that women did treat SS as a luxury compared to PA in short-term contexts, as SS had a greater impact on women's judgments of short-term desirability as the level of PA rose.

While these findings lend broad support for predictions derived from evolutionary theories of basic mate preferences and the MPPM, it is noteworthy that more effects were evinced through discrete attribute levels than through perceptions of attribute levels, which suggests that the traditional approach of using ordinal variables may inflate differences between attribute levels. Another important consideration is that the sample size of Study 1 might be inadequate for the complex interaction and quadratic effects being examined.

Study 2

We conducted a second study to replicate Study 1. Using the smallest detected effect in Study 1 (effect-size $r = .06$), a priori power analyses indicated that at least 961 participants would be needed to detect an effect with 80% power.

Method

Participants, Materials, and Procedure

A total of 964 undergraduate participants ($M_{age} = 21.99$ years, $SD_{age} = 1.77$, 51.7% females) from a large Singapore university enrolled in exchange for course credits. Study 2's materials and procedure were similar to those employed in Study 1.

Results

Men's and Women's Long- and Short-Term Mate Preferences

Analyses were based on the same approach as in Study 1. Results revealed that the four-way interaction between all the variables was not significant in both models (discrete attribute levels: $b = 0.02$, 95% Confidence Interval ($CI_{95\%}$) [-0.01: 0.05], $t(9149.08) = 1.15$, $p = .250$; participants' perceptions of attribute levels, $b = 0.01$, $CI_{95\%}$ [-0.02: 0.03], $t(8645.15) = 0.63$, $p = .529$). These interaction results are graphically presented in Figure 3 (Panels A and B for long-term preferences and Panels C and D and for short-term preferences).

Long-term preferences. For Hypotheses 1a-1d, the simple Attribute Type × Attribute Level interaction among men was significant (discrete attribute levels: $b = 0.11$, $CI_{95\%}$ [0.04: 0.17], $t(4631.44) = 3.28$, $p < .001$, effect-size $r = .05$; participants' perceptions of attribute levels: $b = 0.06$, $CI_{95\%}$ [0.01: 0.12], $t(4836.02) = 2.34$, $p = .020$, effect-size $r = .03$). As indicated in the left half of Table 4, female target attribute level more strongly impacted men's ratings of target long-term desirability when the target attribute was PA (versus SS), thus supporting Hypothesis 1a. For women, there was also a significant simple Attribute Type × Attribute Level interaction (discrete attribute levels: $b = 0.39$, $CI_{95\%}$ [0.33: 0.45], $t(4622.84) = 12.67$, $p < .001$, effect-size $r = .18$; participants' perceptions of attribute levels: $b = 0.17$, $CI_{95\%}$ [0.12: 0.22], $t(4793.89) = 6.84$, $p < .001$, effect-size $r = .10$). As indicated in the left half of Table 4, male target attribute level more strongly impacted women's ratings of target long-term desirability when the target attribute was SS (versus PA), thus supporting Hypothesis 1b.

Testing the impact of PA on men's versus women's ratings of target long-term desirability

revealed a significant simple Sex × Attribute Level interaction for PA using the discrete attribute levels, b = -0.11, $CI_{95\%}$ [-0.20: -0.03], t(2584.31) = -2.75, p = .006, effect-size r = .05, but not using participants' perceptions of attribute levels, b = -0.04, $CI_{95\%}$ [-0.11: 0.02], t(2677.77) = -1.29, p = .198. As seen in the left half of Table 4, target PA impacted men's (versus women's) judgments of target long-term desirability more but only when using the discrete attribute levels, thus partially supporting Hypothesis 1c. For SS, the simple Sex × Attribute Level interaction was significant (discrete attribute levels: b = 0.17, $CI_{95\%}$ [0.10: 0.25], t(2097.57) = 4.56, p < .001, effect-size r = .10; participants' perceptions of attribute levels: b = 0.07, $CI_{95\%}$ [0.01: 0.13], t(2039.36) = 2.30, p = .022, effect-size r = .05). As the left half of Table 4 shows, target SS more strongly impacted women's (versus men's) judgments of target long-term desirability, thus supporting Hypothesis 1d.

Short-term preferences. Testing Hypotheses 2a-2d, the simple Attribute Type × Attribute Level interaction among men was significant (discrete attribute levels: b = -0.45, $CI_{95\%}$ [-0.51: -0.39], t(4447.48) = -14.91, p < .001, effect-size r = .22; participants' perceptions of attribute levels: b = -0.37, $CI_{95\%}$ [-0.42: -0.32], t(4354.18) = -14.74, p < .001, effect-size r = .21). As the right half of Table 4 shows, female target attribute level impacted men's ratings of target short-term desirability more when the target attribute was PA (versus SS), thus supporting Hypothesis 2a. For women, the simple Attribute Type × Attribute Level interaction was also significant (discrete attribute levels: b = -0.24, $CI_{95\%}$ [-0.30: -0.18], t(4453.64) = -8.09, p < .001, effect-size r = .12; participants' perceptions of attribute levels: b = -0.29, $CI_{95\%}$ [-0.34: -0.25], t(4465.21) = -12.52, p < .001, effect-size r = .18). As the right half of Table 4 shows, male target attribute level impacted women's ratings of target short-term desirability more when the target attribute was PA (versus SS), thus supporting Hypothesis 2b.

Testing the impact of PA on men's versus women's ratings of target short-term desirability revealed a significant simple Sex × Attribute Level interaction for PA (discrete attribute levels: b = -0.11, $CI_{95\%}$ [-0.18: -0.04], t(1829.87) = -3.14, p = .002, effect-size r = .07; participants' perceptions of attribute levels: b = -0.07, $CI_{95\%}$ [-0.12: -0.02], t(1540.68) = -2.64, p = .008, effect-size r = .07). As the right half of Table 4 shows, increasing target PA more strongly impacted men's (versus women's) ratings of target short-term desirability, thus supporting Hypothesis 2c. For SS, the simple Attribute Type × Attribute Level interaction was significant using the discrete attribute levels, b = 0.10, $CI_{95\%}$ [0.02: 0.18], t(2511.57) = 2.54, p = .011, effect-size r = .05, but not when using participants'

perceptions of attribute levels, b = 0.01, $CI_{95\%}$ [-0.16: 0.07], t(2621.79) = 0.27, p = .786. As the right half of Table 4 shows, target SS more strongly impacted women's (versus men's) ratings of target short-term desirability only when using the discrete attribute levels, thus partially supporting Hypothesis 2d.

Long-term versus short-term preferences. In testing Hypotheses 3a-3d, the simple Mating Context × Attribute Level interaction for PA among men was significant (discrete attribute levels: b = -0.28, $CI_{95\%}$ [-0.34: -0.22], t(4495.64) = -9.06, p < .001, effect-size r = .13; participants' perceptions of attribute levels: b = -0.22, $CI_{95\%}$ [-0.27: -0.18], t(4316.91) = -9.12, p < .001, effect-size r = .14). As Table 4 shows, target PA more strongly impacted men's judgments of target short-term (versus long-term) desirability. Conversely, a significant Mating Context × Attribute Level interaction for target SS (discrete attribute levels: b = 0.28, $CI_{95\%}$ [0.22: 0.34], t(4600.67) = 8.82, p < .001, effect-size r = .13; participants' perceptions of attribute levels: b = 0.21, $CI_{95\%}$ [0.16: 0.26], t(4513.62) = 7.91, p < .001, effect-size r = .12) reflected that SS had a stronger effect on men's ratings of female long-term (versus short-term) desirability. Hence, Hypotheses 3a and 3c were supported.

For PA among women, the Mating Context × Attribute Level interaction was also significant (discrete attribute levels: b = -0.28, $CI_{95\%}$ [-0.34: -0.22], t(4462.09) = -9.43, p < .001, effect-size r = .14; participants' perceptions of attribute levels: b = -0.20, $CI_{95\%}$ [-0.24: -0.15], t(4310.13) = -8.37, p < .001, effect-size r = .13). As Table 4 shows, PA had a stronger impact on women's judgments of short-term (versus long-term) desirability. Conversely, a significant Mating Context × Attribute Level interaction for partner SS (discrete attribute levels: b = 0.35, $CI_{95\%}$ [0.29: 0.41], t(4647.87) = 11.44, p < .001, effect-size r = .17; participants' perceptions of attribute levels: b = 0.27, $CI_{95\%}$ [0.22: 0.32], t(4518.66) = 11.13, p < .001, effect-size r = .16) reflected that target SS more strongly impacted women's judgments of male long-term (versus short-term) desirability, thus supporting Hypotheses 3b and 3d.

Mate Preference Priorities

Marginal utility analyses. As per Study 1, we used two-level mixed models, where target ratings were nested within participants, to conduct marginal utility analyses. Our linear versus quadratic results are graphically presented in Figure 4 (Panels A and B for long-term preferences and Panels C and D and for short-term preferences).

Long-term mates. To examine the extent to which men and women considered target PA a necessity versus a luxury in a long-term mate, we regressed participants' ratings of target long-term desirability onto attribute level and a quadratic coefficient of attribute level (Attribute Level × Attribute Level). Similar to Study 1, we conducted this model four times. As shown in the left half of Table 5, men's preference for PA in a long-term mate had a significant positive linear effect and negative quadratic effect when using the discrete attribute levels but not when using men's perceptions of attribute levels (p = .444). We thus re-estimated this latter model excluding the quadratic coefficient, which revealed a linear association. Women's preference for PA in a long-term mate did not have a significant negative quadratic effect (discrete attribute levels: p = .376; women's perceptions of attribute levels: p = .144). Re-estimating both models with the quadratic coefficient excluded revealed significant positive linear effects in both models. Hence, Hypothesis 4a was partially supported whereas Hypothesis 4b was fully supported.

To examine the extent to which men and women considered target SS a necessity versus a luxury in a long-term mate, we regressed participants' ratings of target long-term desirability onto attribute level and a quadratic coefficient of attribute level. We again conducted this model four times. Results indicated that both men's and women's preference for SS in a long-term mate demonstrated a significant quadratic effect using both operationalizations of attribute level. Here, Hypothesis 4c was not supported whereas Hypothesis 4d was fully supported.

Short-term mates. To examine the extent to which men and women considered target PA a necessity versus a luxury in a short-term mate, we regressed participants' ratings of target short-term desirability onto attribute level and a quadratic coefficient of attribute level. We again ran this model four times. As shown in the right half of Table 5, men's preference for PA in a short-term mate exhibited a significant positive linear effect and negative quadratic effect when using the discrete attribute levels but not when using men's perceptions of attribute levels (p = .702). Thus, we re-estimated this latter model excluding the quadratic coefficient, which revealed a linear association. Women's preference for PA in a short-term mate did not have a significant negative quadratic effect using the discrete attribute levels (p = .131) but did when using women's perceptions of attribute levels; we thus we re-estimated the former model excluding the quadratic coefficient, which revealed a linear association. These results partially supported Hypotheses 5a and 5b.

To examine the extent to which men and women considered target SS a necessity versus a luxury in a short-term mate, we regressed participants' ratings of target short-term desirability onto attribute level and a quadratic coefficient of attribute level. Once more, we conducted this model four times. Results showed that men's preference for SS in a short-term mate did not reveal a significant negative quadratic using both operationalizations of attribute level (discrete attribute levels: $p = .538$; men's perceptions of attribute levels: $p = .328$). Thus, we re-estimated both models excluding the quadratic coefficient, and both models revealed significant positive linear effects. Women's preference for SS in a short-term mate demonstrated a significant quadratic effect using both operationalizations of attribute level. Hence, Hypotheses 5c was supported whereas hypothesis 5d was not supported.

Evidence for luxuries in interactive effects. Mirroring our analyses in Study 1, we next examined whether the impact of a potential luxury attribute on men's and women's short- and long-term desirability is stronger when a necessity attribute is high rather than low. Consistent with Study 1's findings, results demonstrated that target PA and target SS interacted to predict women's judgments of male long- and short-term desirability (long-term desirability using the discrete attribute levels: $b = 0.31$, $CI_{95\%}$ [0.19: 0.42], $t(1456.95) = 5.34$, $p < .001$, effect-size $r = .14$; long-term desirability using women's perceptions of attribute levels: $b = 0.18$, $CI_{95\%}$ [0.12: 0.24], $t(1422.62) = 5.70$, $p < .001$, effect-size $r = .15$; short-term desirability using the discrete attribute levels: b = 0.24, $CI_{95\%}$ [0.13: 0.35], $t(1432.72) = 4.22$, $p < .001$, effect-size $r = .11$; short-term desirability using women's perceptions of attribute levels: $b = 0.09$, $CI_{95\%}$ [0.04: 0.15], $t(1401.99) = 3.19$, $p = .001$, effect-size $r = .08$). Also consistent with Study 1's findings, in long-term contexts, the impact of target PA was greater at high levels of SS (discrete attribute levels: $t(1456.15) = 12.19$, $p < .001$; women's perceptions of attribute levels: $t(1439.08) = 15.78$, $p < .001$) than at low levels of SS (discrete attribute levels: $t(1432.48) = 3.95$, $p < .001$; women's perceptions of attribute levels: $t(1400.14) = 7.26$, $p < .001$). In short-term contexts, the impact of SS was greater at high levels of PA (discrete attribute levels: $t(1442.16) = 12.65$, $p < .001$; women's perceptions of attribute levels: $t(1392.36) = 8.90$, $p < .001$) compared to low levels of PA (discrete attribute levels: $t(1425.62) = 6.21$, $p < .001$; women's perceptions of attribute levels: $t(1417.13) = 6.55$, $p < .001$).

Results additionally demonstrated that, consistent with Study 1's findings, the impact of target

SS on men's judgments of female long-term desirability depends on the level of PA (discrete attribute levels: $b = 0.23$, $CI_{95\%}$ [0.12: 0.35], $t(1350.92) = 3.90$, $p = .001$, effect-size $r = .11$; men's perceptions of attribute levels: $b = 0.17$, $CI_{95\%}$ [0.10: 0.24], $t(1306.68) = 5.12$, $p < .001$, effect-size $r = .14$), such that the impact of SS is greater at high levels of PA (discrete attribute levels: $t(1355.42) = 16.48$, $p < .001$; men's perceptions of attribute levels: $t(1304.19) = 20.68$, $p < .001$) than at low levels (discrete attribute levels: $t(1357.00) = 10.61$, $p < .001$; men's perceptions of attribute levels: $t(1302.41) = 14.12$, $p < .001$). In short-term contexts, the impact of SS on men's ratings was greater at high levels of PA, $t(1296.93) = 5.95$, $p < .001$, than at low levels, $t(1307.24) = 2.98$, $p = .003$, when using men's perceptions of attribute levels, $b = 0.07$, $CI_{95\%}$ [0.01: 0.13], $t(1301.10) = 2.30$, $p = .002$, effect-size $r = .06$, but not when using the discrete attribute levels: $b = 0.08$, $CI_{95\%}$ [-0.04: 0.19], $t(1346.12) = 1.31$, $p = .191$. Thus, based on this analytical approach, women considered PA a luxury in long-term contexts and SS a luxury in short-term contexts, whereas men deemed female SS a luxury in long-term contexts (and there was also partial support for men considering female SS a luxury in short-term contexts).

Discussion

Once more, results were broadly consistent with predictions derived from evolutionary theories of mate preferences, though two predictions (Hypotheses 1c and 2d) were supported only when using discrete attribute levels. Tests of the MPPM again supported the predictions that women judging long-term mates would treat SS as a necessity (Hypothesis 4d) but not PA (Hypothesis 4b), while men judging short-term mates would not treat SS as a necessity (Hypothesis 5c). However, against predictions, our data showed that SS was treated as a necessity when men judged long-term mates (Hypothesis 4c) and when women judged short-term mates (Hypothesis 5d). Probing further, the second set of priority analyses revealed that although SS was substantially valued by men in long-term contexts and by women in short-term contexts, SS still exerted a greater impact only at higher levels of PA for men in long-term contexts and for women in short-term contexts, thus indicating that SS was still more of a luxury than PA in these specific relationship contexts. Finally, the predictions that men would treat PA as a necessity when judging long-term (Hypothesis 4a) and short-term mates (Hypothesis 5a) were supported only when using discrete attribute levels, as well as the prediction that women would treat PA as a necessity when judging short-term mates (Hypothesis 5b), which was

supported only when using perceptions of attribute levels.

These results attest to the robustness of evolutionary theories of mate preferences and the MPPM. Both studies confirmed most of the basic mate preference predictions, and with the more strongly powered Study 2, all of the basic mate preference predictions were confirmed by at least one form of attribute operationalization. Findings from tests of the MPPM were slightly mixed, with SS emerging as an unexpectedly more important attribute for both sexes. These results indicate a heightened valuation of SS in the current sample.

General Discussion

The current research afforded a novel test of the MPPM using an adapted version of the profile-based mate preference paradigm, thereby providing the first application of this model without relying solely on simple attribute labels while replicating and extending earlier findings of both paradigms in an East Asian country. Two major sets of findings emerged. First, we found broad support for sex-differentiated mate preferences as predicted by evolutionary theory through the profile paradigm, thus constituting a successful replication of Townsend and Levy's work. Increasing levels of PA had a stronger positive effect on men's versus women's judgments of the desirability of potential long- and short-term mates, whereas increasing SS had a stronger positive effect on women's versus men's judgments. For both sexes, a stronger impact was found for PA on the desirability of short-term mates and SS on the desirability of long-term mates. These results are in line with an evolutionary perspective, which explains how preferences vary adaptively according to sex and mating context (Buss & Schmitt, 1993; Li & Kenrick, 2006), and previous mate preference research (e.g., Chang et al., 2011; Shackelford et al., 2005), including those from the original profile-based studies (Townsend & Levy, 1990a; 1990b).

Second, both studies demonstrated that, consistent with the MPPM (e.g., Li et al., 2002; 2013), women treated SS but not PA as a necessity in long-term contexts, while men treated PA as a necessity in long-term contexts and SS as a luxury in short-term contexts. Inconsistent with expectations, however, our more highly powered Study 2 showed that SS was also considered a necessity by men in long-term contexts and by women in short-term contexts. In the second set of priority analyses on whether the impact of a potential luxury attribute is stronger when a necessity attribute is high rather than low, both studies found that women considered PA a luxury in long-term

contexts and SS a luxury in short-term contexts, whereas men considered SS a luxury in long-term contexts only.

While support was found for most of our hypotheses across both ordinal and continuous operationalizations of the attribute variables, more effects were detected with the traditional ordinal approach where attributes were categorized as low, medium, and high, suggesting that treating these variables as equally spaced may add a degree of spurious effect (Bauer & Curran, 2004). Our study therefore suggests that continuous operationalizations of independent variables are preferable for similar investigations.

Overall, the results broadly support our hypotheses and provide evidence that mate preferences are sex-differentiated and prioritized to varying degrees across mating contexts. These findings are consistent with previous mate preference research in which men prize and prioritize PA in prospective partners more than women do, and women prize and prioritize SS in prospective partners more than men do. Our overarching findings indicate that, based on a sample that is both culturally and generationally distinct from those of the original studies that introduced the profile-based paradigm (Townsend & Levy, 1990a; 1990b), sex-differentiated mate preferences and prioritization of certain attributes as necessities—in particular, when measured with an ecologically valid profile-based paradigm—are quite robust.

Unexpected Findings

Two unexpected results deserve special attention: SS had positive effects on men's judgments of long-term mates and women's judgments of short-term mates. In other words, SS was valued more highly than expected. When considered together with the results of the second set of priority analyses, this pattern becomes less discrepant. That is, for long-term mates, men valued PA as a necessity but SS as a luxury. For short-term mates, women valued SS as a luxury. Thus, even though the two attributes had equal influence on a potential mate's desirability across the full range of the attributes, a more detailed analysis of the marginal effects of attribute levels suggests different prioritizations in line with the MPPM. It is also worth noting that because necessities and luxuries refer to relative prioritizations and the attributes in the current study were independently manipulated rather than pitted against each other (let alone against other attributes), it is unsurprising that not all hypothesized attributes evinced the expected patterns.

At least two factors may have led to a greater valuation of SS and, thus, more equal valuation of the two attributes in our study. First, consistent with findings from recent mate preference studies conducted in Singapore and the US (Li et al., 2011), Singapore and Australia (Yong et al., 2019), as well as in China (Chang et al., 2011), the stronger preference for SS by participants in our study compared to those in the original profile-based studies (Townsend & Levy, 1990a; 1990b) and other related studies (e.g., Townsend, 1993) may stem from cultural differences in the value of this attribute. That is, although SS is universally valued (Marmot, 2004), the traditional features of East Asian culture (to which Singapore belongs) may produce a stronger obsession with SS. For instance, the East Asian concept of "face" implicates the importance to one's social image of having a good education, a prestigious job, and family prestige (Ho, 1977), which are core components of SS. Studies indeed show that various aspects of SS such as face, materialism (i.e., the desire to acquire and display markers of wealth and status), and socioeconomic status are especially important to Singaporeans (Li et al., 2015; Li et al., 2010; Yong et al., 2019) and other East Asians (Twenge & Campbell, 2002).

Second, the current sample's strong valuation of SS may reflect the pace of economic development in Asia (Chang et al., 2011) and high cost of living in Singapore. As living expenses in urbanized and developed East Asian countries are among the highest in the world today (Siscovick, 2018), SS as a means of obtaining financial resources may become an important consideration when choosing a mate. Singapore, where a dual income is considered necessary to most families (Quek, 2014), also ranks among the highest in terms of female literacy and labor participation (Human Development Reports, 2016). Thus, the normative expectation that Singaporean women should work and earn money may result in their being evaluated significantly on the basis of SS (Oppenheimer, 1988). In sum, the sociocultural and economic features of our study's setting may heighten the importance placed on SS, resulting in deviations in mate preferences from those typically expected by evolutionary theories of mating.

Limitations, Strengths, and Future Directions

One limitation of the current research is our use of Singaporean college samples. Although this allowed us to test the MPPM with and extend the results of Townsend and Levy (1990a; 1990b) to a novel non-Western sample, our ability to generalize these results to other Far Eastern samples

may be constrained. On the one hand, mate preferences may be fairly universal; on the other hand, factors such as urbanicity may induce a favoring of attributes like SS (Yong et al., 2019). Moreover, college students represent the middle to upper classes in society and, thus, may not be representative of the preferences of the broader population. Another limitation is that factors like relationship status and sexual orientation may influence mate preferences, but these variables were not accounted for. As such, future research should aim to replicate our study with more diverse samples and explore the moderating effects of key individual differences.

While we followed from the well-established hypothesis that women's short-term mating provides access to good genes (e.g., Li & Kenrick, 2006), other hypothesized functions of short-term mating include gaining immediate resources or evaluating potential partners as long-term mates (Greiling & Buss, 2000). Thus, women may care just as much about SS or resources if short-term mating ancestrally served these purposes. When female participants were asked to evaluate potential short-term partners, they could have imagined not only "one-night stands" but other forms of short-term mating as well, so concluding that our findings are representative of a generalized short-term mating psychology might be problematic. The resource-seeking functions of casual sexual relationships might also explain some of our unexpected findings (i.e., women's stronger valuation of SS and treatment of PA as a non-necessity in short-term mating). While this possibility does not weaken the takeaway that our sample held a higher regard for SS compared to other samples that have been studied in previous mate preference research, further work on the differences that underlie motivations for short-term mating should nevertheless prove insightful.

Given that PA is assessable at a quick glance while understanding a person's SS may require longer term interaction, another limitation is that pictures may provide more information about a person's PA than text descriptions can about their SS. Furthermore, even if the picture and description are presented simultaneously, participants may have seen the picture first and made an assessment of PA before reading and assessing SS. Thus, the profile-based method may reflect modern dating (e.g., dating apps, speed-dating; see Li et al., 2013) rather than how mating assessments were made in the ancestral contexts where our mating adaptations developed, in which people typically assessed potential mates that they already knew (not total strangers) and had information about their SS through reputation or personal experience. Hence, it is possible that the elevated importance of SS in

our sample came not from the fact that the participants were from Singapore, but because they had less information about SS or because it was assessed after PA. Nonetheless, Townsend and colleagues ran studies that depicted SS using both vivid descriptions (e.g., townie, crunchie, preppie) and pictures (e.g., fast food uniform, t-shirt and jeans, business suit) and found similar results across methods. The fact that we found most of our predicted effects for SS despite getting participants to obtain that information through an evolutionarily novel fashion (reading) also attests to the importance of SS and may assuage some concerns. In addition, research has indicated that rich descriptions can indeed conjure vivid images in people's minds (Chow et al., 2014). With that said, future work is still recommended to test profiles where SS is manipulated visually rather than descriptively.

Importantly, the MPPM has never been tested using Townsend and colleagues' profile-based method, and the profile-based method has scarcely been applied to non-Western samples for mate preferences research. Hence, our well-powered study adds to the MPPM literature by being one of the few studies to have applied an ecologically valid method to assess men's and women's prioritization of desired attributes for short- and long-term relationships (Li et al., 2002; Thomas et al., 2020; also see Li et al., 2013, Study 2), bridging traditional survey research that asks people to rate or rank the importance of abstract terms with studies involving the selection of actual mates in live-interactive contexts (Eastwick & Finkel, 2008; Li et al., 2013; Luo & Zhang, 2009) and valuation of partners in actual relationships (Meltzer et al., 2014a). Nevertheless, more studies are needed to establish the correspondence between stated mate preferences and actual mate choice—a topic that has been hotly debated in recent years (e.g., Eastwick & Finkel, 2008; Li & Meltzer, 2015; Meltzer et al., 2014b).

Conclusion

The research presented suggests that men and women differ in the attributes they consider necessities in prospective mates, and these sex differences in mate preferences have remained fairly robust across culture and time. Nevertheless, a few unexpected findings highlight the usefulness of considering priorities rather than simple preferences and point to the possibility that cultural factors may interact with evolved mate preferences to create some flexibility in what we value in our relationship partners. Overall, we find that cultural norms or living circumstances may skew mate preferences to some extent, but by and large the key attributes that have been essential to reproductive

value throughout evolutionary history remain, to this day, at the core of mate preference psychology.

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Footnote

[1]An exception is an attribute information-prioritizing paradigm that was introduced and tested in one study (Li et al., 2002, Study 3). This study, however, also relied on attribute labels.

[2]To reduce participant fatigue and the possibility that participants can deduce the experimental design, we opted to not fully cross all levels. Our analytical strategy also accounted for the fact that each participant saw multiple targets rather than all targets.

[3]A key feature of necessities (and luxuries) is that they reflect the prioritization of attributes that are directly pitted against each other such that tradeoffs between attributes are made (e.g., Li et al., 2002).

The current paradigm, however, independently manipulates the two attributes, which renders it a somewhat weaker test of priorities.

Appendix A: Studies investigating priorities/trade-offs.

Study	Priorities/trade-offs examined	Method
Li, Bailey, Kenrick, & Linsenmeier (2002)	Preferences for traits in long-term romantic partners	Budget allocation task using trait terms (Studies 1 and 2) Mate screening method using trait terms (Study 3)
Fletcher, Tither, O'Loughlin, Friesen, & Overall (2004)	Preferences for traits in casual dating and long-term and short-term romantic partners	Forced choice method using textual descriptions of hypothetical mates (Studies 1 and 2)
Li & Kenrick (2006)	Preferences for traits in short-term romantic partners	Budget allocation task using trait terms (Studies 1 and 2) Mate screening method using trait terms (Study 3)
Vigil, Geary, & Byrd-Craven (2006)	Low-income women's preferences for traits in long-term and short-term romantic partners	Budget allocation task using trait terms
Cottrell, Neuberg, & Li (2007)	Preferences for traits in group members	Budget allocation task using trait terms (Study 3)
Li (2007)	Preferences for traits in the	Budget allocation task using trait

	self and romantic partners across long-term and short-term contexts	terms
Bleske-Rechek, Vanden Heuvel, & Vander Wyst (2009)	Age variations in preferences for traits in romantic partners	Budget allocation task using trait terms (Studies 2 and 3)
Edlund & Sagarin (2010)	Moderating effect of mate value on preferences for traits in romantic partners across various relationship contexts	Budget allocation task using trait terms
Apostolou (2011)	Preferences for traits in romantic partners versus in-laws	Budget allocation task using trait terms (Studies 1 and 2)
Lee & Zietsch (2011)	Women's preferences for traits in romantic partners as a function of pathogen prevalence and resource scarcity	Budget allocation task using trait terms
Li, Valentine, & Patel (2011)	Cross-cultural preferences for traits in long-term and short-term romantic partners	Budget allocation task using trait terms

Jonason, Luevano, & Adams (2012)	Dark Triad personality effects on preferences for relationship types	Budget allocation task using terms for relationship types
Lewis, Al-Shawaf, Conroy-Beam, Asao, & Buss (2012)	Preferences for traits in opposite-sex friends	Budget allocation task using trait terms
Senko, Belmonte, & Yakhkind (2012)	Preferences for traits in professors	Budget allocation task using trait terms
Li et al. (2013)	Preferences for physical attractiveness and social status in romantic partners	Manipulation of physical attractiveness and social status in online chat partners (Study 2) Manipulation of social status in speed-dating chat partners (Study 3) Manipulation of physical attractiveness in speed-dating chat partners (Study 4)
Marzoli et al. (2013)	Preferences for traits in romantic partners across various environmental scenarios	Budget allocation task using trait terms (Studies 1 and 2)

Alrakaf, Sainsbury, Rose, & Smith (2014)	Effects of achievement goal orientations on preferences for traits in teachers	Budget allocation task using trait terms
Jonason, Wee, & Li (2014)	Effects of culture on preferences for traits in employees	Budget allocation task using trait terms (Studies 1 and 2)
Nichols & Cottrell (2014)	Preferences for traits in leaders across leadership levels	Budget allocation task using trait terms (Study 3)
Sadalla, Berlin, Neel, & Ledlow (2014)	Usage of water across various household uses	Budget allocation task using terms for household uses
Mogilski, Wade, & Welling (2014)	Preferences for history of sexual fidelity in long-term and short-term mates	Conjoint analysis using textual descriptions of hypothetical mates (Studies 1 to 3)
Furnham & McClelland (2015)	Effects of age, social class, ethnicity, and height on preferences for traits in a person to go on a blind date with	Budget allocation task using trait terms

March, Grieve, & Marx (2015)	Effects of sexual orientation on preferences for physical attractiveness and social status in long-term and short-term romantic partners	Budget allocation task using trait terms
Jonason, Nolland, & Tyler (2017)	Effects of geographical distance on preferences for traits in long-term and short-term romantic partners	Budget allocation task using trait terms
March, Van Doorn, & Grieve (2018)	Preferences for traits in booty-call partners	Budget allocation task using trait terms
Russell, Babcock, Lewis, Ta, & Ickes (2018)	Women's preferences for sexual orientation of friends	Budget allocation task using archetype terms (Study 2)
Mogilski, Vrabel, Mitchell, & Welling (2019)	Preferences for personality traits in romantic partners	Conjoint analysis using textual descriptions of hypothetical mates
Zhang, Wang, Lee, DeBruine, & Jones	Cross-cultural preferences for traits in long-term and short-	Budget allocation task using trait terms

(2019)	term romantic partners	
Thomas et al. (2020)	Cross-cultural preferences for traits in long-term and short-term romantic partners	Budget allocation task using trait terms

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Table 1: Specific hypotheses regarding basic mate preferences and mate preference priorities.

Hypothesis	Supported? Study 1	Study 2
Basic Mate Preferences		
1 Relative Attribute Preferences in Long-Term Contexts		
(1a) Partner PA has a greater impact on men's judgments of the desirability of potential mates than does partner SS.	No	Yes
(1b) Partner SS has a greater impact on women's judgments of the desirability of potential mates than does partner PA.	Yes	Yes
Sex Differences in Long-Term Contexts		
(1c) Partner PA has a greater impact on judgments of the desirability of potential mates for men than for women.	Yes	Yes*
(1d) Partner SS has a greater impact on judgments of the desirability of potential mates for women than for men.	Yes	Yes
2 *Relative Attribute Preferences in Short-Term Contexts*		
(2a) Partner PA has a greater impact on men's judgments of the desirability of potential mates than does partner SS.	Yes	Yes
(2b) Partner PA has a greater impact on women's judgments of the desirability of potential mates		

	than does partner SS.	Yes	Yes
	Sex Differences in Short-Term Contexts		
(2c)	Partner PA has a greater impact on judgments of the desirability of potential mates for men than for women.	Yes	Yes
(2d)	Partner SS has a greater impact on judgments of the desirability of potential mates for women than for men.	No	Yes*
3	*Impact of Physical Attractiveness Across Relationship Contexts*		
(3a)	Partner PA has a greater impact on men's judgments of the desirability of potential short-term mates than of potential long-term mates.	Yes	Yes
(3b)	Partner PA has a greater impact on women's judgments of the desirability of potential short-term mates than of potential long-term mates.	Yes	Yes
	Impact of Social Status Across Relationship Contexts		
(3c)	Partner SS has a greater impact on men's judgments of the desirability of potential long-term mates than of potential short-term mates.	Yes	Yes
(3d)	Partner SS has a greater impact on women's judgments of the desirability of potential long-term mates than of potential short-term mates.	Yes	Yes

Mate Preference Priorities

4	*Necessities in Long-Term Contexts*		
(4a)	Partner PA is a necessity to men.	Yes*	Yes*
(4b)	Partner PA is not a necessity to women.	Yes	Yes
(4c)	Partner SS is not a necessity to men.	Yes*	No
(4d)	Partner SS is a necessity to women.	Yes	Yes
5	*Necessities in Short-Term Contexts*		
(5a)	Partner PA is a necessity to men.	Yes*	Yes*
(5b)	Partner PA is a necessity to women.	No	Yes†
(5c)	Partner SS is not a necessity to men.	Yes	Yes
(5d)	Partner SS is not a necessity to women.	Yes	No

* Supported only using discrete attribute levels (ordinal variable).

† Supported only using perceptions of attribute levels (continuous variable).

Table 2: Study 1: Simple main effects of target attributes and male and female participants' long-term and short-term desirability ratings using both discrete attribute levels and participants' perceptions of attribute levels.

	Using Discrete Attribute Levels									
	Long-Term Desirability					Short-Term Desirability				
	b	$CI_{95\%}$	*df*	*t*	*r*	b	$CI_{95\%}$	*df*	*t*	*r*
Physical Attractiveness										
Male Participants	0.80^{***}	[0.574: 1.027]	577.23	6.93	.28	1.57^{***}	[1.385: 1.756]	451.80	16.63	.62
Female Participants	0.22^{*}	[0.002: 0.443]	602.03	1.98	.08	1.03^{***}	[0.855: 1.214]	471.57	11.32	.46
Social Status										
Male Participants	1.03^{***}	[0.818: 1.237]	634.65	9.63	.36	0.38^{**}	[0.150: 0.617]	744.95	3.23	.12
Female Participants	1.47^{***}	[1.276: 1.666]	626.62	14.82	.51	0.56^{***}	[0.337: 0.773]	739.05	5.00	.18
	Using Participants' Perceptions of Attribute Levels									
	Long-Term Desirability					Short-Term Desirability				

	b	$CI_{95\%}$	*df*	*t*	*r*	b	$CI_{95\%}$	*df*	*t*	*r*
Physical Attractiveness										
Male Participants	0.35^{***}	[0.256: 0.449]	716.97	11.24	.39	1.55^{***}	[1.408: 1.696]	477.26	21.17	.70
Female Participants	0.69^{***}	[0.500: 0.881]	732.25	7.12	.25	1.33^{***}	[1.182: 1.473]	501.50	17.87	.62
Social Status										
Male Participants	1.07^{***}	[0.915: 1.233]	662.25	13.24	.46	0.67^{***}	[0.492: 0.858]	779.54	7.23	.25
Female Participants	1.30^{***}	[1.148: 1.446]	652.22	17.09	.56	0.59^{***}	[0.420: 0.765]	782.77	6.73	.23

Note. We report unstandardized coefficients. Effect-size $r = \sqrt{\frac{t^2}{t^2 + df}}$.

Table 3: Study 1: Regression of attribute level and quadratic coefficient of attribute level on men's and women's long-term and short-term desirability ratings using both discrete attribute levels and participants' perceptions of attribute levels.

	Using Discrete Attribute Levels									
	Long-Term Desirability					Short-Term Desirability				
	b	$CI_{95\%}$	*df*	*t*	*r*	b	$CI_{95\%}$	*df*	*t*	*r*
Men										
PA	1.26***	[1.025: 1.501]	255.50	10.47	.55	2.04***	[1.857: 2.215]	245.72	22.41	.82
PA^2	-0.36†	[-0.784: 0.061]	265.68	-1.69	.10	-0.33†	[-0.664: 0.002]	268.92	-1.96	.12
Women										
PA	0.40**	[0.127: 0.674]	317.07	2.88	.16	1.23	[1.012: 1.454]	318.30	10.99	.52
PA^2	-	-	-	-	-	-	-	-	-	-
Men										
SS	1.19***	[0.953: 1.431]	297.41	9.83	.50	0.55	[0.267: 0.830]	289.48	3.83	.22
SS^2	-0.90***	[-1.306: -0.486]	294.85	-4.30	.24	-	-	-	-	-
Women										
SS	1.86***	[1.683: 2.036]	343.91	20.69	.74	0.94	[0.712: 1.163]	342.91	8.19	.40

SS^2	-0.88***	[-1.187: -0.569]	346.82	-5.60	.29	-	-	-	-	-

Using Participants' Perceptions of Attribute Levels

	Long-Term Desirability					Short-Term Desirability				
	b	$CI_{95\%}$	*df*	*t*	*r*	b	$CI_{95\%}$	*df*	*t*	*r*
Men										
PA	1.35***	[1.184: 1.519]	294.99	15.89	.68	1.84***	[1.716: 1.958]	295.85	29.76	.77
PA^2	-	-	-	-	-	-	-	-	-	-
Women										
PA	0.93***	[0.709: 1.148]	350.92	8.32	.41	1.55	[1.400: 1.701]	352.91	20.29	.73
PA^2	-	-	-	-	-	-	-	-	-	-
Men										
SS	1.20***	[1.028: 1.376]	296.61	13.62	.62	0.80	[0.587: 1.007]	292.45	7.48	.40
SS^2	-	-	-	-	-	-	-	-	-	-
Women										
SS	1.54***	[1.404: 1.674]	346.96	22.41	.77	0.81	[0.632: 0.984]	349.11	9.05	.44
SS^2	-0.42***	[-0.589: -0.246]	345.99	-4.79	.25	-	-	-	-	-

Note. We report unstandardized coefficients. Effect-size $r = \sqrt{\frac{t^2}{t^2 + df}}$. We report single dashes when quadratic estimates were not significant and thus removed from the model.

Table 4: Study 2: Simple main effects of target attributes and male and female participants' long-term and short-term desirability ratings using both discrete attribute levels and participants' perceptions of attribute levels.

	Using Discrete Attribute Levels										
	Long-Term Desirability						Short-Term Desirability				
	b	$CI_{95\%}$		*df*	*t*	*r*	b	$CI_{95\%}$		*df*	*t*	*r*
Physical Attractiveness												
Male Participants	0.83^{***}	[0.71:	0.95]	2587.60	13.87	.26	1.40^{***}	[1.29"	1.50]	1831.09	26.75	.53
Female Participants	0.60^{***}	[0.49:	0.71]	2580.33	10.43	.25	1.17^{***}	[1.07:	1.27]	1828.36	23.24	.48
Social Status												
Male Participants	1.04^{***}	[0.93:	1.15]	2093.34	19.06	.38	0.49^{***}	[0.37	0.60]	2503.65	8.30	.16
Female Participants	1.39^{***}	[1.28:	1.49]	2101.19	26.39	.50	0.69^{***}	[0.58:	0.80]	2518.55	12.26	.24

	Using Participants' Perceptions of Attribute Levels										
	Long-Term Desirability						Short-Term Desirability				

	b	$CI_{95\%}$		*df*	*t*	*r*	b	$CI_{95\%}$		*df*	*t*	*r*
Physical Attractiveness												
Male Participants	1.00***	[0.90:	1.09]	2661.16	20.75	.37	1.45***	[1.37:	1.52]	1524.47	37.45	.69
Female Participants	0.91***	[0.82:	1.00]	2694.47	19.89	.36	1.31***	[1.23	1.38]	1558.35	35.46	.67
Social Status												
Male Participants	1.12***	[1.04:	1.21]	2084.37	25.90	.49	0.70***	[0.61:	0.80]	1665.91	14.57	.34
Female Participants	1.26***	[1.18:	1.34]	1985.27	31.51	.58	0.72***	[0.63:	0.81]	2566.57	16.26	.31

Note. We report unstandardized coefficients. Effect-size $r = \sqrt{\frac{t^2}{t^2 + df}}$.

Table 5: Study 2: Regression of attribute level and quadratic coefficient of attribute level on men's and women's long-term and short-term desirability ratings using both discrete attribute levels and participants' perceptions of attribute levels.

	Using Discrete Attribute Levels									
	Long-Term Desirability					Short-Term Desirability				
	b	$CI_{95\%}$	*df*	*t*	*r*	b	$CI_{95\%}$	*df*	*t*	*r*
Men										
PA	0.84^{***}	[0.73: 0.95]	1348.38	15.06	.38	1.40^{***}	[1.30: 1.49]	1361.60	29.15	.62
PA^2	-0.38^{***}	[-0.57: -0.19]	1359.62	-3.90	.11	-0.62^{***}	[-0.79: -0.46]	1360.31	-7.50	.20
Women										
PA	0.61^{***}	[0.50: 0.73]	1459.84	10.38	.26	1.18^{***}	[1.08: 1.28]	1460.52	23.64	.53
PA^2	-	-	-	-	-	-	-	-	-	-
Men										
SS	1.04^{***}	[0.94: 1.15]	1355.61	19.60	.47	0.48^{***}	[0.37: 0.60]	1362.01	8.04	.21
SS^2	-0.56^{***}	[-0.74: -0.38]	1367.39	-6.06	.16	-	-	-	-	-
Women										

SS	1.39***	[1.30:	1.48]	1470.35	29.04	.60	0.69***	[0.59:	0.80]	1464.01	12.52	.31
SS^2	-0.88***	[-1.04:	0.72]	1470.11	-10.68	.27	-0.24*	[-0.43:	-0.05]	1464.07	-2.51	.07

Using Participants' Perceptions of Attribute Levels

	Long-Term Desirability						Short-Term Desirability					
	b	$CI_{95\%}$		*df*	*t*	*r*	b	$CI_{95\%}$		*df*	*t*	*r*
Men												
PA	1.07***	[0.99:	1.16]	1305.75	24.96	.57	1.52***	[1.46:	1.59]	1291.95	46.89	.79
PA^2	-	-		-	-	-	-	-		-	-	-
Women												
PA	0.99***	[0.90:	1.08]	1434.72	21.85	.50	1.42***	[1.34:	1.49]	1435.52	37.81	.71
PA^2	-	-		-	-	-	0.08*	[0.01:	0.15]	1434.60	2.11	.06
Men												
SS	1.19***	[1.01:	1.27]	1297.65	28.87	.63	0.74***	[0.64:	0.84]	1310.05	15.25	.39
SS^2	-0.15***	[-0.23:	-0.07]	1309.80	-3.80	.10	-	-		-	-	-
Women												
SS	1.28***	[1.21:	-0.07]	1434.24	35.46	.68	0.74***	[0.66:	0.82]	1425.09	17.36	.42
SS^2	-0.14***	[-0.21:	-0.07]	1434.63	-3.81	.10	-0.09*	[-0.18:	-0.01]	1426.23	-2.10	.06

Note. We report unstandardized coefficients. Effect-size $r = \sqrt{\frac{t^2}{t^2 + df}}$. We report single dashes when quadratic estimates were not significant and thus removed from the model.

Figure 1: Associations between Target PA, Target SS, and Target Desirability in Study 1.

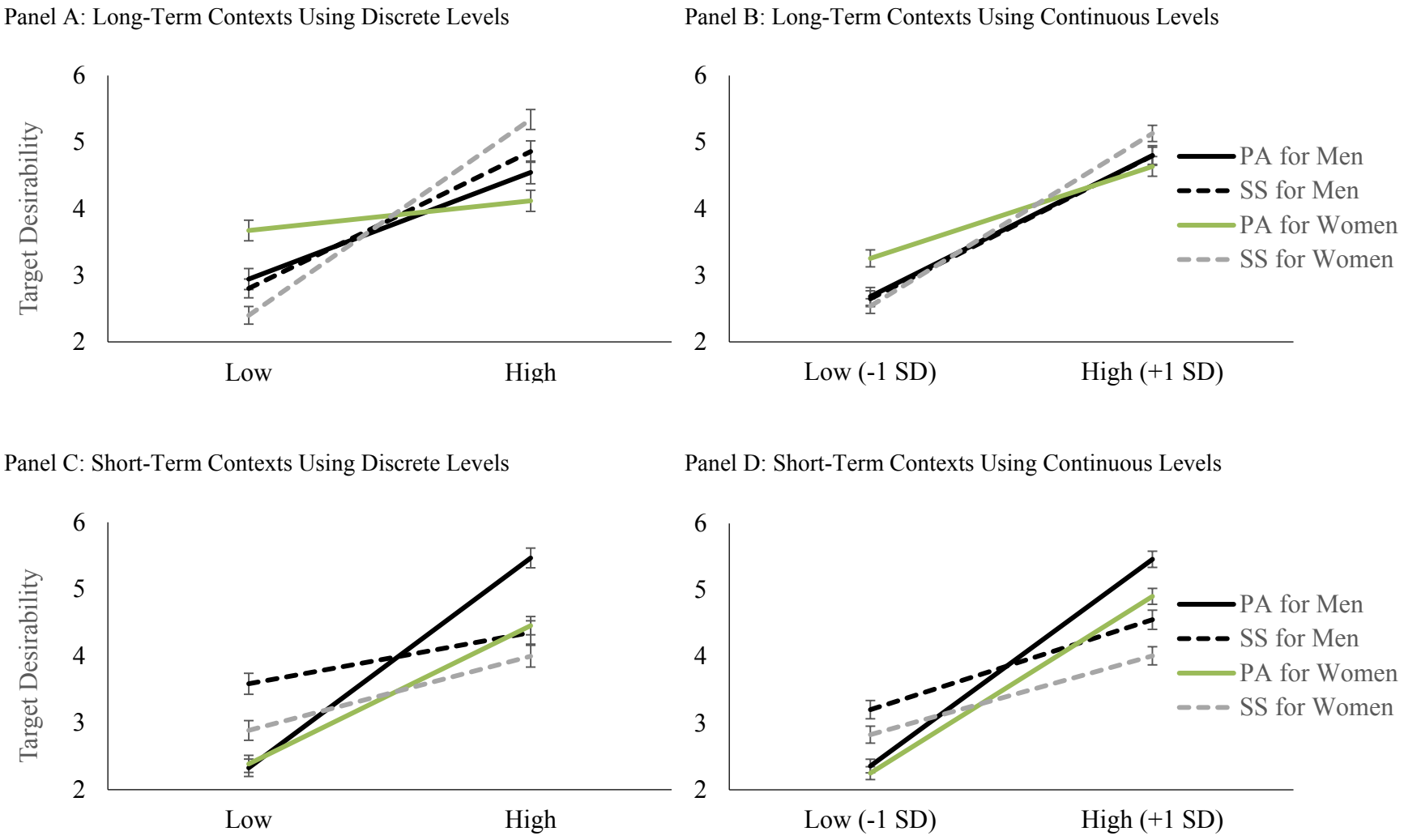

Figure 2: Target PA and Target SS as necessities (quadratic association) versus luxuries (linear association) in Study 1.

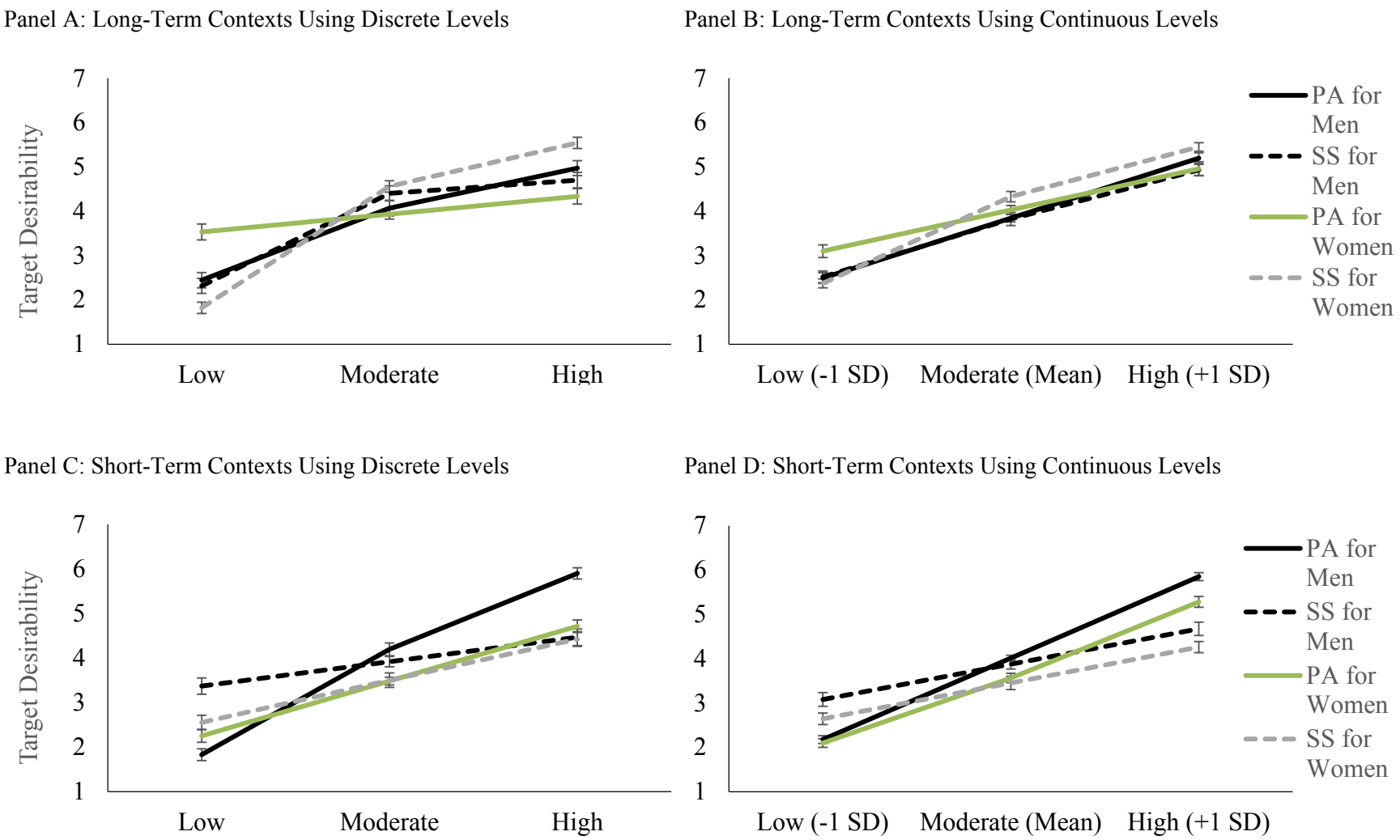

Figure 3: Associations between Target PA, Target SS, and Target Desirability in Study 2.

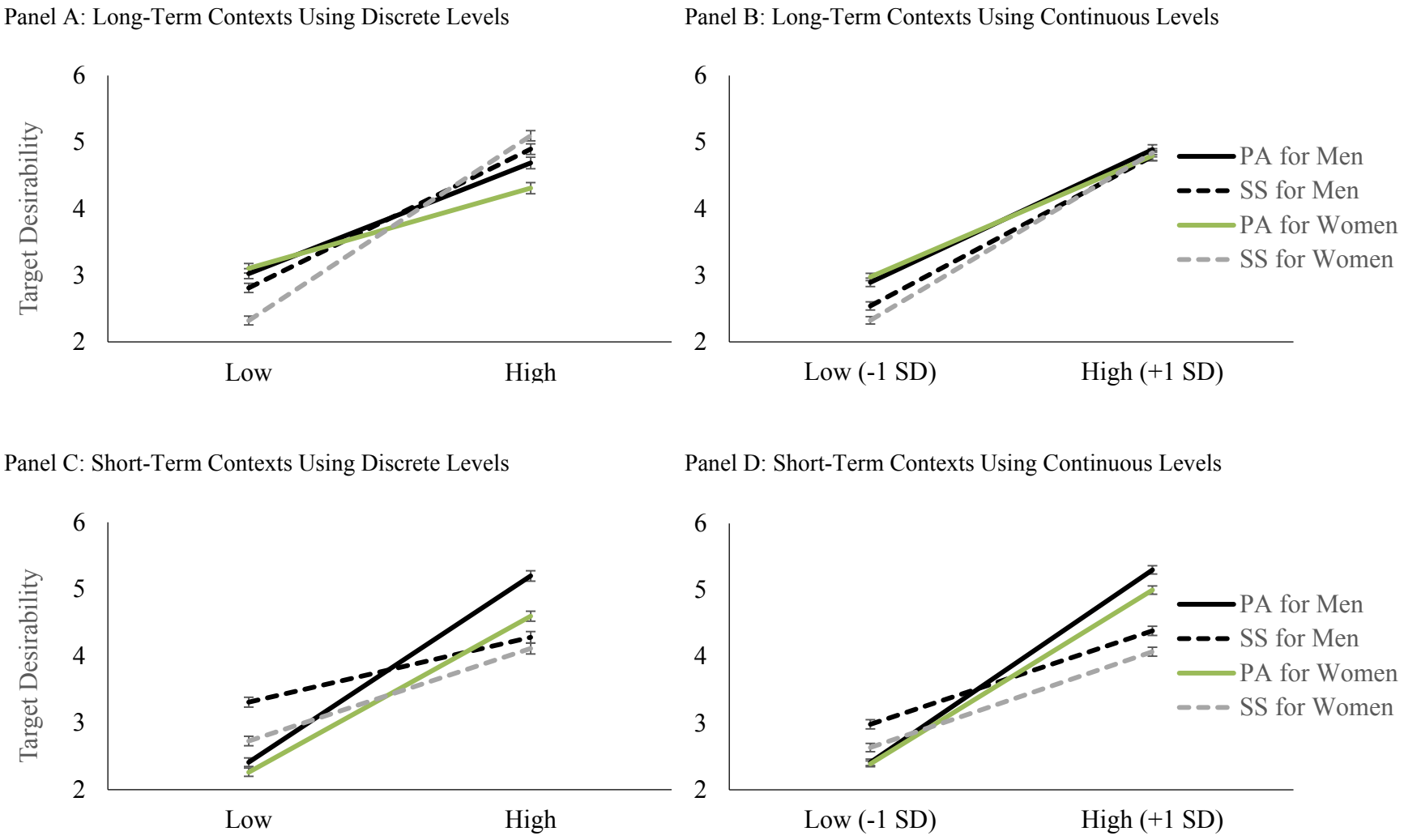

Figure 4: Target PA and Target SS as necessities (quadratic association) versus luxuries (linear association) in Study 2.