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Citation

JONASON Peter K., , BETES, Simone L., & LI, Norman P..(2019). Solving mate shortages: Lowering standards, searching farther, and abstaining. *Evolutionary Behavioral Sciences*, , 1-14.

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Solving mate shortages:
Lowering standards, searching farther, and abstaining

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Published in *Evolutionary Behavioral Sciences*. 2019. Advance online publication.

<https://doi.org/10.1037/ebs0000174>

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Accepted version, April 2019

Abstract

Although much work on mating psychology has focused on mate preferences and responses to desirable sexual and romantic offers, less is known about what happens when individuals face a lack of mating options. We present two studies on (hypothetical) compensatory mating tactics. In Study 1 ($N = 299$), participants were asked to imagine they were struggling to find long-term and short-term mates and we revealed sex differences and context-specific effects consistent with parental investment theory. In Study 2 ($N = 282$), participants were asked to imagine they had been incapable of finding a short-term and long-term mate for six months despite actively trying to find one and then report the likelihood of abstaining, lowering their standards, and traveling farther to find a satisfactory partner; results largely (and conceptually) replicated those from Study 1 but document the role of attachment and (self-reported) mate value in accounting for individual differences in adopting the three mating tactics. We frame our results in terms of how people might solve mate shortages.

Keywords: Sex Differences; Personality; Mating Strategies; Evolutionary Psychology

Public Significance Statement

A major source of frustration in people's lives is their inability to find the romantic and sexual partners they want. This study provides an examination of three compensatory mating tactics people may use when struggling to satisfy their mating needs. Understanding the costs and benefits of these options may help guide people to make more informed decisions of what to do when their romantic and sexual lives are not to their liking.

There is no shortage of research on mate preferences, showing that sex differences in mate preferences have not changed all that much in the last 30 years (Bech-Sørensen & Pollet, 2016), can be replicated in places like China (Chang, Wang, Shackelford, & Buss, 2011), and can be found in dating ad studies decades ago (Harrison & Saeed, 1977). Much of the debate in this area has focused on issues of mate preferences, potential sex differences, and the origin/nature of those preferences with some researchers treating mate preferences as a function of sociological or structural forces (Eagly, 2000; Eagly & Wood, 1999; Zetner & Eagly, 2015) with others contending mate preferences are vestiges of ancient selection pressures (Howard, Blumstein, & Schwartz, 1987; Li & Metzler, 2015). Whatever the origin of mate preferences, countless people are unable to maximize their mating ideals despite the apparent supply of attractive and available partners (Apostolou, 2017, 2019), suggesting people's mating psychologies are sensitive to contextual threats (Reeve, Kelly, & Welling, 2016). Indeed, the whole online dating industry is built on people's desire and struggle to find mates. Tinder[®] (the leading mobile dating application; Duguay, 2016) alone has over 10 million downloads daily, suggesting an examination of what people do when they cannot find mates is warranted. Mate shortages can come about from being characterized by too many "dealbreakers" (Jonason, Garcia, Webster, Li, & Fisher, 2015), the quality of alternatives (Gutierrez, Kenrick, & Partch, 1999), or living in a biased operational sex ratio (Moss & Maner, 2015; Schacht & Borgerhoff Mulder, 2015). When faced by shortages, people should have adaptive responses to mate shortages, or compensatory mating tactics. In this study, we examine three compensatory mating tactics, sex differences in their use, and the role of mate value and attachment in their use.

Previous work on compensatory mating tactics suggests that men's attitudinal and behavioral promiscuity (i.e., sociosexuality) is sensitive to changes in the availability of mates (Arnocky, Woodruff, & Schmitt, 2016), the perception of the availability of mates

encourages jealousy, mate guarding, and intrasexual competition in both sexes (Arnocky, Ribout, Mirza, & Knack, 2014), and mate preferences in both sexes are sensitive to partner scarcity (Taylor, 2013; Watkins, Jones, Little, Debruine, & Feinberg, 2012). Understanding how people solve mate shortages may inform researchers as to individual differences in mating psychology. It may also inform the public of potential strategies they may choose from when struggling to find a mate along with their related costs. We expect people's compensatory mating tactics to be sensitive to costs and benefits of choosing different compensatory mating tactics as a function of participant's sex, the level of investment in the relationship, their mate value, and attachment systems

From an evolutionary perspective, sex differences in mating strategies is a function of the size of the sex cells of each sex which leads to physiological and behavioral differences in the minimum obligatory investment each sex must make in their offspring (Trivers, 1972). Because mammalian males have abundant and small sex cells (i.e., sperm) they invest much less into a mating than females, who have scarce and large sex cells (i.e., ova). This parental investment theory has been modified in human mating psychology to point out that investment in relationships moderates sex differences such that when both sexes invest lots (i.e., long-term relationships) men and women's mating psychology should be similar whereas when only women invest lots (i.e., short-term relationships), the sexes will have different mating psychologies (Buss & Schmitt, 1993). For example, both sexes want a kind mate for long-term partnerships (Li, Bailey, Kenrick, & Linsenmeier, 2002), but men place a higher premium on physical attractiveness in short-term relationships than women do (Li & Kenrick, 2006). Such context-specific sex differences should manifest themselves in compensatory mating tactics and further be sensitive to dispositional biases in mate value and attachment to better understand why men and women might choose one compensatory mating tactic or another.

The Current Study

We consider three potential solutions to mating shortages; lowering standards (Regan, 1998), abstention (Apostolou, 2017, 2019), and searching farther (Jonason, Nolland, & Tyler, 2017). Each of these comes with different costs and benefits that may appeal to men and women for reasons consistent with evolutionary reasoning. Lowering one's standards or "settling" on lower quality mates may increase the total pool of candidate mates available to a person by lowering minimum thresholds for acceptability but may result in pairings with suboptimal or even problematic mates (Jonason et al., 2015). People may settle on lower quality mates out of fear of being single (Spielmann et al., 2013). Abstention, in contrast, may come with losses for mating opportunities now but can result in potentially superior future matings (Apostolou, 2019). And last, traveling farther to find mates comes with metabolic travel costs, time lost in searching, and risk involved with trying to securing and engaging in outgroup matings (e.g., violence, sexual infections) but will increase the pool of candidate mates by searching a wider physical range. Prior research has examined traveling as a compensatory mating tactic in female fur seals (*Callorhinus ursinus*; Hoffman, Forcada, Trathan, & Amos, 2007) and it might be a viable, adaptive (yet understudied in people) tactic to find mates in humans, if we can infer what people might do based on understanding what non-humans have done to solve similar problems (Wilkins & Ebach, 2014).

Sex Differences and Similarities Across Contexts. The way people balance the associated costs and benefits with the choice of tactics may be revealed through an examination of sex differences across the long-term and short-term contexts (Buss & Schmitt, 1993). Because women may have evolved to be less willing to settle for lower quality mates than men are (Feingold, 1992; Kenrick, Groth, Trost, & Sadalla, 1993; Li, Valentine, & Patel, 2011), we expect women to be unwilling to lower their standards for both long- and short-term mates (H1a), but because ancestral men may have benefitted from a more opportunistic

mating pattern (Symons, 1979; Trivers, 1972), men should be more willing to lower their short-term standards (more than women and more than men do for long-term mates) as a mating tactic (H1b). In contrast, we predict that women should be more likely to abstain than men are (H2a) because it helps them avoid mating costs (Jonason et al., 2015) and that abstention (versus lowering standards) should be a particularly appealing tactic in long-term contexts (H2b) because of the heavy investment both sexes give in this context. And last, we expect searching farther¹ as a tactic to increase the number of mates one is exposed to be particularly appealing in the long-term mating context for men and women (H3a) because the costs/time will be unappealing when one wants immediate sexual gratification (i.e., the primary function people ascribe to casual sex; Jonason, 2013) and it may allow people to maintain selectivity while increasing the probability they will find someone, but women may be less willing to travel for their short-term mates given (H3b) because they are less proactive in mate searching than men are.

The Role of Mate Value and Attachment. Beyond sex differences and context effects, we explore the role of two key individual differences; mate value and attachment patterns. Mate value (Buss & Shackelford, 2008; Fisher, Cox, Bennett, & Gavric, 2008; Kirsner, Figueredo, & Jacobs, 2003) reflects one's relative bargaining power in the mating market to maximize their mating goals (Fletcher, Tither, O'Loughlin, Friesen, & Overall, 2004) and, therefore, may guide an individual's choice of and ability to pursue particular mating strategies. In addition, attachment patterns may play a role in choosing compensatory mating tactics. Attachment is a set of relationship expectancies derived from childhood experiences (Ainsworth, Blehar, Waters, & Wall, 1978; Hazan & Shaver, 1987), may play a

¹ To date, the role of distance in mate selection has received limited attention – most of the work has been about how individuals cope with the distance in ongoing relationships (Carpenter & Knox, 1996; Feeney, 1999; Sahlstein, 2004), in another name—propinquity—to predict who marries whom (Bossard, 1932), and in nonhumans including fur seals (*Callorhinus ursinus*; Hoffman et al., 2007), colonial lesser kestrels (*Falco naumanni*; Calabuig, Ortego, Cordero, & Aparicio, 2008), and chacma baboons (*Papio ursinus*; Clarke et al., 2008).

role in decision-making in relationships (Mikulincer & Shaver, 2003; Simpson, 1990) beyond broader units of personality (Shaver & Brennan, 1992) and account for variance in engaging in casual sex around the world (Brennan & Shaver, 1995; Schmitt & Jonason, 2015). In relation to lowering standards, we expect the people who are anxiously attached (H1c) and low in mate value (H1d) to be willing to lower their standards (regardless of context) as these individual differences may reflect individual differences motivating people to not want to wait and risk being lonely (Schachner & Shaver, 2004; Simpson, 1990); they may fear being single (Spielmann et al., 2013). In relation to abstention, we expect those who felt they have more mate value may be more willing to abstain and wait for better mating options to come along as opposed to other options (H2c), because they believe as a function of their (self-perceived) mate value they “can do better” or can afford to wait (Regan, 1998). And when considering casting a wider net, we expect that people low (versus high) in mate value should be more willing to travel for their relationships (regardless of context), because this sense of low worth may motivate people to do more, including traveling farther, to find the love they desire (H3c). Indeed, in male chacma baboons (*Papio ursinus*; Clarke et al., 2008), the distance a male must search for sexual partners is a function of his mate value (i.e., rank).

Perhaps there is no more fundamental problem for the lovelorn and lonely than finding desirable long-term and short-term mates. Failure to do so will adversely affect the relationship/sexual satisfaction and evolutionary fitness of the individual. As such, people may adopt a variety of solutions to this problem; solutions that come with different costs and benefits. While prior research has examined the role of lowering standards (Regan, 1998) and abstaining (Apostolou, 2017) in response to failures to finding mates, little work has examined the alternative of searching farther and no work has examined these three options simultaneously. In two studies, we examine the appeal of these three compensatory tactics,

examine sex differences and context effects, and explore the role of individual differences in attachment and (self-reported) mate value in understanding who adopts different strategies.

Study 1: Context effects and sex differences in tactical choices

We started our investigation of people's mating tactics with a survey employing a forced-choice method. By forcing people to choose between options, this method reveals their decision-making processes differently than Likert-style methods (Li et al., 2002; Li & Kenrick, 2006). We juxtaposed the choice in three potential compensatory mating tactics and examined the role of participant's sex and relationship duration in accounting for choices.

Method

Participants and procedure

Participants were 299 (45% female) paid Mechanical Turk (US\$0.50) workers aged 18-61 ($M = 32.56$, $SD = 9.44$) from the USA.² The minimum sample size was set at 250 because correlations stabilize at that sample size (Schönbrodt & Perugini, 2013). The majority (56%) of participants were in some form of serious relationship (including marriage)³, were heterosexual (94%), and had experience in long distance relationships in the past (64%). Only participants from unique IP addresses were included. Ethics approval was granted by XXXXX University. Ethnically, participants self-identified as white/European (72%), Asian (12%), Hispanic/Latino (9%), African/Black (5%), and "other" (2%). These participants were informed of the nature of the study. If they gave consent, they advanced through a series of randomized self-report personality questions (intended for elsewhere),

² There were no MTruk controls but, we only sampled "Master" workers.

³ There were no differences between single people compared to those who were involved in a relationship in what they would do in a short-term relationship ($\chi^2 = 3.46$) but there were differences in choices across relationship status ($\chi^2 = 7.92$, $p < .05$) with no difference in willingness to lower standards, committed people ($n = 157$) being more willing to choose traveling compared to single people ($n = 124$), and single people ($n = 68$) choosing abstention more than committed people ($n = 46$). We treat this as an anomalous effect and do not consider relationship status further.

reported mating tactics responses to mating shortages, and provided demographic details.

Upon completion, they were thanked and debriefed.

Measure

To measure mating tactic choices, we asked participants to “imagine you are struggling to find a prospective long-term [short-term] partner, please select the option below that is most appealing to you.” In a randomized fashion, participants were presented with an option for traveling farther (i.e., “I would rather increase the distance I am willing to travel.”), lowering standards (i.e., “I would rather lower my standards.”), and for abstention (i.e., “I would abstain from such a relationship at this time.”). Participants were provided with definitions of *short-term partners* as “a casual sex partner, someone you might have a one-night stand with or a booty-call relationship with” and *long-term partners* as “a serious relationship partner, someone you would call boyfriend/girlfriend and even consider marrying” for standardization purposes. Participants were asked to choose just one of these three options and if they were in a relationship to answer as if they were single.

Results

Descriptive statistics are reported in Table 1. In the long-term context, people preferentially chose the travel option followed by abstention, and were least willing to lower their standards ($\chi^2[2] = 32.49, p < .01$). In contrast, in the short-term context, abstaining was the preferred option, followed by traveling farther, and lowering standards was again the least appealing option ($\chi^2[2] = 10.06, p < .01$). When we looked at whether men and women chose among these options differently, we found significant effects for women in both the long-term ($\chi^2[2] = 57.15, p < .01$) and short-term mate ($\chi^2[2] = 58.40, p < .01$) shortages but only for long-term shortages in men ($\chi^2[2] = 104.95, p < .01$). This suggests that it is in the short-term context that the sexes may differ and that men may be somewhat ambivalent to strategy choices when then they face a short-term mate shortage, perhaps as a function of their

opportunistic mating strategy. For the long-term shortage, men preferred to travel farther (Residual = 86) and not to lower their standards (Residual = -58) or abstain (Residual = -28). Women, when facing a short-term mating shortage, preferred abstaining (Residual = 39.3), wanted to avoid lowering their standards (Residual = -31.7), and were relatively ambivalent to traveling farther (Residual = -7.7). Women, when facing a long-term mating shortage, preferred to travel farther (Residual = 40.3) and wanted to avoid lowering their standards (Residual = -27.7) and (somewhat) abstention (Residual = -12.7).

We further tested whether there were context-dependent sex differences in these choices (see Table 1). There were no sex differences in the adoption of different compensatory mating tactics in the long-term context. There was, however, a sex difference in the short-term mating context. While the sexes did not differ in their willingness to search farther for a short-term relationship, when women faced a hypothetical short-term mate shortage, they were likely to choose abstention (Residual = 4.5) and especially unlikely to lower their standards (Residual = -3.8) whereas when men face a hypothetical short-term mate shortage, they were likely lower their standards (Residual = 2.4) and unlikely to abstain (Residual = -2.9).

Discussion

This study represents the first examination of three compensatory mating tactics. Men and women appear to prefer to travel farther for long-term relationships. This may be because they are unwilling to tolerate the costs for (especially) lowering their standards and (somewhat) abstaining. When it comes to short-term relationships, women were more likely to abstain whereas men were more likely to lower their standards. Results align with parental investment (Trivers, 1972) and sexual strategies (Buss & Schmitt, 1993) theory predictions related to cost asymmetries in mating choices in men and women as a function of the duration of the courtship.

Study 2: Responding to Shortages

In Study 1 we found that the selection of mating tactics varied according to sex and mating duration as expected. However, we relied solely on forced-choice questions which might artificially inflate sex differences. In Study 2, we replicate Study 1 by explicitly asking participants to imagine they are experiencing short-term and long-term mating droughts and to indicate how likely they are to adopt three mating tactics. In addition, we extend this by exploring the role of two salient individual differences; mate value and attachment.

Method

Participants and procedure

Participants were 282 (59% female, 2 “other” excluded from sex-related analyses) paid Mechanical Turk (US\$0.50) workers aged 18-72 ($M = 34.75$, $SD = 10.85$) from the USA who were sampled independently and one month after Study 1.⁴ Sample size minimums and ethical permissions were established like Study 1. The majority (74%) of participants were in some form of serious relationship (including marriage)⁵, were heterosexual (94%), and had experience in long distance relationships in the past (67%). Ethnically, participants self-identified as white/European (74%), Asian (9%), Hispanic/Latino (8%), African/Black (7%), and “other” (2%). Participants were informed of the nature of the study. If they gave consent, they advanced through a series of randomized (across measures) self-report personality questions, reported compensatory responses to mate shortages, and provided demographic details. Upon completion, they were thanked and debriefed.

Measures. We used Li’s Mate Value scale (see Jonason et al., 2019) to measure three dimensions of participant’s self-reported mate value. Participants were asked their agreement (1 = *Strongly disagree*; 7 = *Strongly agree*) with items presented in a randomized fashion.

⁴ There were no MTruk controls used in this study except for sampling “Master” workers.

⁵ There were only weak differences for relationship status in the adoption of the any of the mate shortage solutions, thus we proceeded with tests without taking this into consideration further.

Items were averaged to create indexes of attractiveness as a short-term mate (e.g., “Compared to my peers, I am very attractive or desirable to the opposite sex”), attractiveness as a long-term mate (e.g., “People seem to be interested in having a long-term relationship with me”), and a general unattractiveness or difficulty in relationships (e.g., “I tend to have a more difficult time attracting potential mates than other people do”). Items were averaged to create indexes of attractiveness as a short-term mate (Cronbach’s $\alpha = .87$), attractiveness as a long-term mate ($\alpha = .77$), and a general undesirability or difficulty in relationships ($\alpha = .90$).⁶ Short-term and long-term mating attractiveness were correlated ($r(280) = .37, p < .01$). Long-term mating attractiveness was correlated with general undesirability ($r(280) = .39, p < .01$) and anxious attachment ($r(280) = .31, p < .01$). And general undesirability was correlated with anxious attachment ($r(280) = .77, p < .01$).

To measure individual differences in attachment patterns we used the Experiences in Close Relationships-Revised (ECR-R) Questionnaire (Fraley, Waller, & Brennan, 2000). Participants were asked how much they agreed (1 = *Disagree Strongly*; 7 = *Agree Strongly*) with 36 randomized items described. For instance, to measure anxious attachment, participants were shown the item “I’m afraid that I will lose my partner’s love” whereas to measure avoidant attachment, participants were shown the item “I prefer not to show a partner how I feel deep down”. Items were averaged to create indexes of anxious attachment ($\alpha = .93$) and avoidant attachment ($\alpha = .82$) that were orthogonal ($r = .08$).

To assess individual differences in how participants responded to mating scarcity, they were asked to imagine an inability to find mates with the following text:

For the next questions, imagine you are having trouble finding a sexual partner for a short-term relationship [serious relationship partner for a long-term

⁶ As this is an unpublished scale, we encourage the interested reader to contact the third author to assess the face validity of the items.

relationship], you have been actively trying for 6 months. Think about how that would make you feel and answer the questions below with that in mind.

Participants were then provided with three options (i.e., Search farther in terms of distance from you; Lower your standards of how particular you are about whom you date; Make no changes at all and remain single). They were asked how likely they would be to do the following (1 = *Not at all*; 5 = *Very Much*) assuming they were now single. Responses across mating context and the same tactics were correlated ($r_s \approx .60$, $p_s < .01$). The order of the responses and the mating durations were randomized.

Results

We begin by testing two mixed-model ANOVAs with the three solutions to mating shortages within each mating duration (descriptive statistics provided in Table 2). When success in short-term mating endeavors was (imagined to be) threatened, we found a main effect across the three possible solutions ($F[2, 554] = 10.60$, $p < .01$, $\eta_p^2 = .04$) such that people were most willing to abstain, least willing to lower standards, and moderately willing to travel with all comparisons significant ($p < .05$). We also found an interaction of participant's sex and the long-term mating threat solutions ($F[2, 554] = 8.00$, $p < .05$, $\eta_p^2 = .03$). When success in long-term mating endeavors was threatened, we found a main effect across the three possible solutions ($F[2, 552] = 44.26$, $p < .01$, $\eta_p^2 = .14$) such that people were most willing to abstain than lower their standards ($p < .01$) and travel more than lower their standards ($p < .01$) with no difference between traveling farther and abstaining. We also found an interaction of participant's sex and the long-term mating threat solutions ($F[2, 552] = 3.11$, $p < .05$, $\eta_p^2 = .01$). Both interactions above reflect differences in men and women's willingness to adopt a given strategy in response to mating threats in each domain. Women were more willing to travel farther for a long-term than a short-term partner ($t = -3.71$, $p < .01$) but more willing to lower their standards for a short-term than a long-term partner ($t =$

2.70, $p < .01$). While men and women similarly lowered their standards more for short-term partners than long-term ones ($t = 4.57, p < .01$), men were more likely to abstain when facing a long-term mating shortage ($t = -1.99, p < .01$). In addition, men were more willing to lower their standards for their short-term ($t = -3.91, p < .01$) and less so for their long-term partners ($t = -2.20, p < .05$) whereas women were more willing to abstain when faced with a short-term mate shortage ($t = 1.98, p < .05$).

Next, we examined individual differences in attachment and mate value (Table 3). Those who felt they had difficulty in relationships and attachment anxiety were more willing to travel and lower their standards when faced with a short-term mate shortage. Those who felt they were undesirable as mates and reported attachment anxiety indicated greater propensity to travel and lower their standards when faced with a long-term mate shortage. Attachment avoidance was associated with abstaining when faced with a short-term mate shortage. Those who felt they had high long-term mate value were unlikely to abstain when facing a long-term mate shortage, were unlikely to lower their standards when faced with a short-term mate shortage and were more likely to travel when faced with a long-term mate shortage.

When we tested whether the overall correlations were moderated by participant's sex, we found little evidence for systematic moderation. Men who were low on avoidant attachment ($r = -.14, p < .05$) were more willing (Fisher's $z = 2.04, p < .05$) to lower their standards when facing a short-term mating shortage compared to women ($r = .10, ns$) and the same men ($r = -.14, p < .05$) were more willing ($z = 1.88, p < .05$) to lower their standards when facing a long-term mating shortage compared to women ($r = .09, ns$). In contrast, women with short-term mating attractiveness ($r = .14, ns$) were slightly more likely to lower their standards when faced with a long-term mate shortage ($z = 1.72, p < .05$) compared to men ($r = -.07, ns$).

Discussion

Again, we have shown evidence consistent with sexual strategies theory that sex differences in mating strategies are sensitive to relationship context. There are systematic patterns in the choices men and women make in how they opt to solve the adaptive problem of mating scarcity. Women remain biased against lowering their standards in general but were especially unwilling to do so in the short-term. Men in contrast, were especially willing to lower their standards for short-term relationships. Traveling farther is an appealing option for long-term partners as it likely offsets the related costs of the other two but it is unappealing in the short-term given delays in mating, costs, and even a conflict with the sexual gratification motives behind casual sex. In addition, willingness to adopt the compensatory tactics was correlated with individual differences in mate value and attachment and further moderated (slightly) by participant's sex.

General Discussion

Walk down the street of Sydney, Singapore, or Seattle and one will be presented with an apparently infinite range of potential mates. Similarly, swiping through dating applications like Tinder® presents a similar picture; there is a plethora of apparently available partners (Apostolou, 2019). However, despite the abundance, many people struggle to find romantic and sexual partners and we contend this is likely to be a recurrent adaptive problem whether in high population areas or not. Some people even fear they have run out time to find a mate (Spielmann et al., 2013). Finding mates is the first problem one must solve before being able to select a good partner, rearing offspring, and retaining the mate – tasks that are considered fundamental from an evolutionary perspective on mating psychology. In hopes of understanding individual differences in tactics adopted to solve this problem, we asked participants to choose between three mating tactics when imaging a mate shortage. We lowering standards (Regan, 1998), abstaining (Apostolou, 2017), and searching farther

(Jonason, Nolland, & Tyler, 2017), adding to prior work examining how mating strategies are sensitive to partner scarcity (Arnocky, Woodruff, & Schmitt, 2016; Arnocky et al., 2014; Taylor, 2013; Watkins et al., 2012). To understand these compensatory mating tactics, we examined sex differences in the long-term and short-term mating contexts (Buss & Schmitt, 1993) and examined the role of individual differences in (self-reported) mate value and attachment in predicting variance in opting into these tactics when faced with a mating and relationship drought.

Our results are consistent with evolutionary reasoning that suggests men and women are sensitive to the costs and benefits they each face and receive, respectively, from potential mates (Symons, 1979; Trivers, 1972). We examined the option of lowering standards (Regan, 1998), which may allow for finding more mates, but comes with the cost of pairing with less desirable partners. This is consistent with work suggesting that those who fear being single, they consistently pick partners who are less responsive and less attractive as dating targets (Spielmann et al., 2013). Men, in the short-term context, were particularly willing to choose this option as were those who have psychological indicators of a need for love in the form of attachment dysfunctions and a sense of limited success in romantic endeavors. By lowering their standards or “settling” in sex partners, men may better gain access to the sexual gratification they are seeking while not imposing major costs on themselves. In contrast, because women pay heavier costs for making bad mating choices (Jonason et al., 2015), they may avoid this compensatory mating tactic. Beyond sex differences in the use of this tactic, we found that those who felt they were low in mate value and anxiously attached were likely to lower their standards for short- and long-term mates but these traits did not predict the adoption of the other tactics. This may mean that those who are characterized by these traits may have an immediate need to pair-up leading them to incur the costs associated with lowered standards.

We also examined the option of abstaining (Apostolou, 2017) whereby individuals may temporarily refrain from dating presumably in hopes of finding a better partner later. On its surface, this tactic seems like a bad choice because it could mean reproductive oblivion. However, if the abstention is temporary, it might be a useful tactic for such a long-lived species as humans. This tactic allows one to maintain relatively high standards unlike lowering one's standards, but may come with the costs of missed opportunities, loneliness, and reproductive exclusion. Such people may not fear being single (Spielmann et al., 2013). Both sexes appeared to favor this option for long-term mates, but not as much for short-term mates. If one's goals are short-term in nature, abstention undercuts the very objectives one is pursuing. That is, abstention as a compensatory mating tactic is a long-term solution; biding one's time now in hopes of finding a better option later (Apostolou, 2017, 2019). We found limited evidence for a role of mate value or attachment in describing individual differences in adopting this tactic. The little evidence we found suggests those with high in mate value as a long-term partner were less likely to abstain for a short-term mate whereas those with an avoidant attachment pattern were more likely to abstain for short-term mates. The former may reflect a belief in those with high mate value have no need to abstain because of their value whereas the latter may reflect an aversion of sexual intimacy for avoidant individuals.

And last, we examined the option of increasing the size of one's mating pool by traveling farther (Jonason, Nolland, & Tyler, 2017). This tactic allows people to offset the costs of the other two whilst incurring travel costs and the potential difficulty of engaging in a relationship at a distance (Carpenter & Knox, 1996; Feeney, 1999; Sahlstein, 2004). Both sexes invest heavily in long-term partnerships (Li et al., 2002) making having a high-quality partner especially important. By traveling farther to find new mates, both sexes avoid the costs associated with lowering one's standards while still finding a partner which would be delayed by abstention. In addition, we found that those with low mate value and an anxious

attachment pattern were willing to choose this compensatory tactic in the short- but not the long-term. This may reflect a willingness to do anything to satisfy their sexual needs in these people, anything including traveling farther, incurring those costs in the pursuit of sex.

As noted above, there is a substantial (Bech-Sørensen & Pollet, 2016; Chang et al., 2011) and contentious (Li & Metzler, 2015; Zetner & Eagly, 2015) literature surrounding questions regarding mating psychology. We have attempted to avoid that debate by not concerning ourselves with questions of what men and women want in their mates and why. Instead, we attempted to examine a more pragmatic issue, one that has direct relevance for people's relationship and sexual satisfaction. Nevertheless, our results are more consistent with evolutionary than sociocultural models of mating psychology. Sociocultural models have no *a priori* reasons (we know of) to predict the patterns we found. Instead, the asymmetries of reproductive costs afforded by modern evolutionary models of mating psychology allow for a more robust account of what we found.

Our results may have some applied implications. Many people struggle to satisfy their sexual and/or relationship agendas. They remain unpaired when they would rather be in a relationship or they remain celibate when they would rather engage in sex (e.g., "incels"). Our study directly informs people and counselors as to the pros and cons of three different solutions to mate shortages. While people may have already engaged in such tactics or even advised clients, friends, and family to do so, they may have not fully considered the ramifications of these tactics nor how those tactics may align or misalign with evolved biases based on parental investment theory (Trivers, 1972). We hope our results help others better consider their options when facing mate shortages.

Limitations and Conclusions

Despite the novelty and methodological heterogeneity of our studies, several limitations are worth mentioning. First, although our samples were older in age than typical

college-student samples, our is still W.E.I.R.D. (i.e., Western, educated, industrialized, rich, and democratic; Henrich, Heine, & Norenzayan, 2010) and online. Although we have no particularly strong reason to distrust online samples (Buhrmester, Kwang, & Gosling, 2011), cross-cultural work might be warranted as Americans have ready access to cars and other public transportation than in developing nations that might attenuate the adoption of mating tactics like traveling and higher population density may permit abstention because the probability of meeting another partner is higher than in tribal societies (Ember, 1978).

Second, we may have constrained ourselves by focusing on only two relationship contexts and the specific individual differences we included. For instance, although comparing short-term and long-term relationships is useful for highlighting sex-based differences in mate preferences (Buss & Schmitt, 1993), a comprehensive account of what people want in their romantic/sexual partners must include a wider range of relationships (e.g., same-sex and polyamorous; see Jonason & Balzarini, 2016; Jonason, Valentine, & Li, 2012). Similarly, while we examined two individual differences that may influence decisions in relationships, others of relevance might include sociosexuality (Simpson & Gangestad, 1991), income, and approach/avoidance tendencies.

Third, we have examined hypothetical mating strategies as opposed to actual adjustments people might make in response to real mating shortages. This means that our results not only lack ecological validity but also participant's decisions could be described as "cold reasoning". Prior work has cast doubt on the trustworthiness of hypothetical judgments in the mating domain (Eastwick & Finkel, 2008), but subsequent and potentially superior work reveals that hypothetical choices resemble "real" choices (Li et al., 2013). Nevertheless, experimental manipulations of mate shortages are warranted. For instance, making people believe they are unlikely to find a mate in the near future and then assessing tactical choices might prove fruitful.

Fourth, we only explored the role of three tactics in solving the adaptive problem of mate shortages. There may be more tactics that people have developed over the millions of years of human evolution and ones that people may have inherited through phylogenetic inertia since the evolution of sex some 500 million years ago. For example, mate poaching might be a compensatory mating strategy where men and women can try to compensate for their inability to find a committed partner by merely having sex with people. That is, they lower their standards for commitment in exchange for sex. Indeed, such a mating strategy may come with relationship dissatisfaction as a cost (Foster et al., 2013). Nevertheless, our goal here was not to document every possible mating tactic; future research might explore this more fully. However, it is possible that there are social desirability effects (that we cannot control for) in people's willingness to choose a given tactic. We hope to have minimized this through the use of online methods.

Fifth, one might contend that the definitions we used to prompt participants with short-term and long-term contexts were problematic. We hoped to standardize responses and get participants thinking about specific relationships to improve the validity of the hypothetical task they were engaging in. Nevertheless, the use of specific relationship terms may have created some noise in our model, thereby attenuating our results.

Sixth, the omission of online dating as a potential tactic might be problematic. While there is a growing body of research on the use of dating applications and websites, we would contend that the mating tactics laid out in this study are larger in scope than adopting online dating. Online dating is a way to find mates, but the tactics people employ within this mating niche are likely characterized by the tactics we explored here. We expect that abstention (i.e., getting off the application), lowering one's standards (i.e., swiping more liberally), and searching farther (i.e., expanding one's search radius) play out in a similar fashion on and offline as humans carry their evolved mating psychology with them across locations and

contexts. Despite these limitations, we have detailed new information about mating tactics as they are geared towards solving the adaptive problem of mate shortages.

While there has been research on responses to perceived scarcity of mates or imbalances in the ratio of men to women in a population (Arnocky, Woodruff, & Schmitt, 2016; Arnocky et al., 2014; Taylor, 2013; Watkins et al., 2012) less research has examined the tactical responses people might adopt when suffering mate shortages. In this study, we examined what people do—in a tactical sense—when they cannot find a romantic/sexual partner. We explored three options, examined sex differences, and tested the role of individual differences in attachment and mate value. The results align with evolutionary models of mating consistent with parental investment theory (Trivers, 1972) because the choice of different compensatory tactics overall and in men and women appears sensitive to the costs/benefits associated with contextual differences in relationship context in men and women (Buss & Schmitt, 1993). While there may be many other potential tactics one adopts, we feel these three represent different decision-making processes and, therefore, represent a good cross-section of the responses people might adopt when facing mate shortages. We encourage more work that can inform on the processes that people engage in when adjusting their mating tactics in response to feedback in their dating lives.

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TABLES

Table 1. Overall choice in each tactic and sex differences in those choices (Study 1).

	Count (%)			χ^2	Φ
	Overall	Men	Women		
Long-Term Mate					
Abstaining	73 (24)	41 (25)	32 (24)	0.90	.04
Lowering standards	43 (14)	26 (16)	17 (13)		
Travelling farther	183 (61)	98 (59)	85 (63)		
Short-Term Mate					
Abstaining	131 (44)	47 (29)	84 (63)	52.17**	.34
Lowering standards	68 (23)	55 (33)	13 (10)		
Travelling farther	100 (34)	63 (38)	37 (28)		

* $p < .05$, ** $p < .01$

Table 2. Descriptive statistics for responses to mating shortages (Study 2).

	Traveling Farther	Lowering Standards	Abstaining
<i>Overall STM</i>	2.49 (1.22)	2.26 (1.17)	2.84 (1.35)
Men	2.54 (1.22)	2.58 (1.14)	2.65 (1.39)
Women	2.46 (1.22)	2.04 (1.14)	2.96 (1.32)
<i>Overall LTM</i>	2.73 (1.18)	1.96 (1.05)	2.95 (1.33)
Men	2.64 (1.15)	2.12 (1.05)	2.83 (1.36)
Women	2.80 (1.20)	1.84 (1.03)	3.02 (1.30)

Note. STM = short-term mating; LTM = long-term mating

Table 3. Correlations between mate value and attachment and likelihood of choosing each mating tactic in response to mating shortages (Study 2).

	Traveling Farther			Lowering Standards			Abstaining		
	STM	LTM	<i>z</i>	STM	LTM	<i>z</i>	STM	LTM	<i>z</i>
STM Attractiveness	.05	-.07	2.18*	-.01	.06	-1.33	.02	-.06	1.58
LTM Attractiveness	.07	.14*	-1.27	-.13*	-.08	-0.95	-.03	-.14*	2.19*
General Undesirability	.15**	.06	1.64	.24**	.31**	-1.40	.05	.09	-0.79
Attachment Anxiety	.13*	.04	1.64	.21**	.29**	-1.58	-.01	.03	-0.79
Attachment Avoidance	-.11	-.07	-0.72	-.01	-.01	0.00	.14*	.09	0.99

Note. *z* Steiger's *z* to compare dependent correlations; STM = short-term mating; LTM = long-term mating
 * $p < .05$, ** $p < .01$