

Playing Hard-to-Get: Manipulating One's Perceived Availability as a Mate

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Abstract: 'Playing hard-to-get' is a mating tactic in which people give the impression that they are ostensibly uninterested to get others to desire them more. This topic has received little attention because of theoretical and methodological limitations of prior work. We present four studies drawn from four different American universities that examined playing hard-to-get as part of a supply-side economics model of dating. In Studies 1a (N = 100) and 1b (N = 491), we identified the tactics that characterize playing hard-to-get and how often men and women enact them. In Study 2 (N = 290), we assessed reasons why men and women play hard-to-get along with the personality traits associated with these reasons. In Studies 3 (N = 270) and 4 (N = 425), we manipulated the rate per week prospective mates went out with people they had just met and assessed participants' willingness to engage in casual sex and serious romantic relationships with prospective mates (Study 3) and the money and time they were willing to invest in prospective mates (Study 4). We frame our results using a sexual economics model to understand the role of perceived availability in mating dynamics. Copyright © 2012 European Association of Personality Psychology

Key words: playing hard-to-get; sexual economics; sex differences; evolutionary psychology

Playing hard-to-get is a mating strategy that some people adopt to alter the degree to which others find them desirable as a mate (Bailey & Garrou, 1983; Eastwick, Finkel, Mochon, & Ariely, 2007; Mathews, Rosenfield, & Stephan, 1979; Walster, Walster, Piliavin, & Schmidt, 1973; Wright & Contrada, 1986). There is little consensus on what 'playing hard-to-get' is, whether it works, and if so, how and why it works (Scott, 2009). We contend that this is because of theoretical and methodological limitations in prior work that preclude strong inference. In this study, we use an evolutionary paradigm to update work on playing hard-to-get across four studies assessing both actor (self-report studies) and target effects (experimental studies). We examine how individual differences in who plays hard-to-get and the effect of being hard-to-get as a potential mate provides insights consistent with the economic paradigms used in evolutionary psychology. In so doing, we provide a coherent framework to understand playing hard-to-get.

Theoretically, playing hard-to-get has been investigated with proximate models (i.e., the *how*) versus ultimate models (i.e., the *why*). For instance, playing hard-to-get effects have been explained with the following: (i) 'postdiction' about how men want women who are not available to others but available to them (Walster et al., 1973, p. 120); (ii) reciprocal liking (Eastwick et al., 2007); (iii) female participants being told a male target liked her a lot or an average amount (Whitchurch, Wilson, & Gilbert, 2011); and (iv) female participants functioned to create reactance, thereby increasing liking (Wright, Wadley, Danner, & Phillips, 1992).

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Darwin (1871) noted the role of playing hard-to-get in mating; he called it coyness. These disparate findings might be integrated using evolutionary theory.

Research on playing hard-to-get has also been methodologically limited. In some studies, only one sex was represented as targets or as participants (Walster et al., 1973; Whitchurch et al., 2011). Also, previous research has only examined participants' likelihood of going out with prospective mates on one-on-one dates (Mathews et al., 1979; Scott, 2009; Walster et al., 1973), potentially obscuring the fundamental distinction of the duration of the mateship (Buss & Schmitt, 1993). Updating the research on playing hard-to-get with an evolutionary paradigm should include analyses of sex differences and temporal context effects.

Supply-side economics

Economic models are commonly used in the examination of mating psychology (Baumeister & Vohs, 2004; Kenrick, Groth, Trost, & Sadalla, 1993; Li, Bailey, Kenrick, & Linsenmeier, 2002; Li & Kenrick, 2006). In mating markets, much is known about the 'products' (e.g., sexual access, money) that are being exchanged in terms of what people *desire* in their potential mates (Buss, 1989; Fletcher, Tither, O'Loughlin, Friesen, & Overall, 2004) and what they *offer* to them (Cameron, Oskamp, & Sparks, 1977; Campos, Otta, & Siqueria, 2002). Less is known about mating strategies such as playing hard-to-get. When a product is scarce or difficult to obtain, people perceive it to be more valuable than if it is readily available or easy to obtain (Brannon & Brock, 2001; Lynn, 1992; Snyder, 1992; Worchel, 1992). We contend that playing hard-to-get may work through creating

the impression of limited availability (i.e., scarcity) in potential mates' minds, thereby increasing the demand for the person playing hard-to-get. In as much as people's perceptions dictate their actions and decisions, the perceived availability of prospective mates should alter the demand that people place on that mate.

Numerous lines of research converge on this point. For instance, research on the sexual double standard suggests that women who limit their availability by not having sex are considered more desirable and rated more favourably by men (Crawford & Popp, 2003). Research on the operational sex ratio (i.e., the number of sexually reproducing females to males) suggests that when one sex is in short supply, sexual norms will gravitate toward those preferred by that sex (Guttentag & Secord, 1983). Other research indicates that being selective or playing hard-to-get in one's dating life may increase likability (e.g., Bailey & Garrou, 1983; Walster et al., 1973; Wright & Contrada, 1986). Similarly, creating uncertainty seems to increase likability of prospective mates (Whitchurch et al., 2011). Finally, evidence from biology suggests that female garter snakes (genus *Thamnophis*) avoid male garter snakes to enhance their perceived mate quality (Shine, Wall, Langkilde, & Mason, 2005). Collectively, this research suggests that limited availability, created through proximate mechanisms, increases people's approach orientation toward prospective mates.

Current studies

Darwin's (1871) idea about the role of playing hard-to-get (i.e., being coy) has been largely neglected in both social and evolutionary psychology. In contrast, most research on sex differences in sexual psychology (Buss & Schmitt, 1993; Kenrick et al., 1993) stems from parental investment theory (Trivers, 2007). This theory suggests that the sex that bears the greater obligation to offspring is the more choosy sex (females in most species) and will put the opposite sex (usually males) through 'tests' for access. It seems to us that playing hard-to-get might be one way that people—women in particular—can test their prospective mate's commitment and to manipulate their prospective mates to obtain what—or whom—they want. We contend that playing hard-to-get is an individual difference that reflects such a mating strategy.

Men and women both invest heavily in long-term relationships, and therefore, the sexes tend to want similar things in their respective partners (Li et al., 2002). Both sexes want a high-quality mate who is willing to commit (Buss & Schmitt, 1993; Kenrick et al., 1993). Limited availability may signal to prospective mates that a person has the following characteristics: (i) embodies less of a risk for defecting from the partnership; (ii) is less likely to cuckold (for men); (iii) is unlikely to introduce sexually transmitted infections to the couple; (iv) has fewer dangerous ex-partners; and (v) has a better social reputation. Therefore, both sexes may want partners who have limited availability (Study 3) and should be willing to invest (i.e., time and money) more in that mate (Study 4). But because the costs women pay for having sex are insensitive to the duration of the mateship,

men's availability should affect women's decision making similarly across short-term and long-term relationship contexts (Haselton & Buss, 2000). Specifically, women should express a stronger preference for unavailable prospective mates than men do. In contrast, when considering highly unavailable others in one's mating pool, people may find them less appealing for any relationship duration. Therefore, we predict an inverted-U function for people's willingness to date and have a serious romantic relationship with prospective mates who differ on availability, but we expect a negative, monotonic function for casual sex relationships as a function of the prospective mate's availability (Study 3).

Although both sexes are selective toward committed relationship partners, men and women differ in their preference for short-term, casual sex partners. Because the costs women pay for having sex are independent of mateship duration (Buss & Schmitt, 1993), women should not be interested in men who are highly available. A man who is highly available in any duration is one who is likely to defect or to have other partners, which may lead to his resources and investment being shunted to other women. In contrast, because men have reproductively benefited from engaging in short-term, sexual relationships (Buss & Schmitt, 1993), men are likely to be sensitive to cues for future sexual payoffs, especially imminent ones. That is, men may have evolved to prefer indications of sexual exclusivity (e.g., chastity) in their long-term mating partners but to prefer signs of easy, low-cost access (e.g., promiscuity) in their short-term mates (Buss & Schmitt, 1993; Li & Kenrick, 2006). To facilitate access, men should be interested in short-term mates who are highly available. In contrast, women pay the costs of pregnancy and breastfeeding in unwanted pregnancies (at least in ancestral conditions); thus, women may still have an aversion to men who are particularly available because this suggests they may flee rather than invest (Study 3). Therefore, women may choose men who have limited availability to minimize their risk of abandonment.

Alternatively, women may play hard-to-get to minimize the same risks. Playing hard-to-get may motivate interested men to bid higher for women; it may also eliminate men who are likely to have a 'hit-and-run' short-term mating strategy (Jonason, Li, Webster, & Schmitt, 2009). Thus, we expect women to enact acts designed to decrease their apparent supply more than men do. Research on the sexual double standard suggests that by having limited availability, women can increase their likability (Crawford & Popp, 2003). Limiting her availability may act as a filtration mechanism, excluding those men who are only interested in short-term mating. That is, by being less available, a woman may increase her perceived value and, thus, induce men to bid higher by increasing their commitment and investment in her. In contrast, men who limit their availability may pay heavier costs than women will through the loss of potential mating opportunities. Thus, we expect women to play hard-to-get more than men (Study 1).

Despite the expected sex differences in who men and women choose—and whether or not they play hard-to-get—we expect men and women to play hard-to-get for the same reasons. Both sexes can benefit from increasing the demand their mates place in them. Because playing hard-to-get can

increase demand in both sexes, the sexes should not differ in why they do so (Study 2). However, what might afford some individuals the chance to play hard-to-get over others? We suggest that it is those who have high market value. Just as we argued that women play hard-to-get because they have relatively more market value than men do, we would predict that people who have more mate value are ones who can afford to limit their availability. People with more value are likely to have other mating options and can afford to play hard-to-get. Therefore, we predict that mate value will be positively related to trying to increase demand in potential mates (Study 2).

An implied aspect of playing hard-to-get is that people try to influence the mating decisions of prospective mates. People may try to manipulate the market forces around them by limiting their availability to increase the demand others have for them. One personality measure that reflects interpersonal manipulation is Machiavellianism (Christie & Geis, 1970). Those who are high on Machiavellianism may play hard-to-get to manipulate the demand surrounding them. Therefore, we predict that scores on Machiavellianism will be positively related to playing hard-to-get to increase demand (Study 2). Moreover, we expect this Machiavellianism association to be present when controlling for narcissism and psychopathy—the other two traits of the Dark Triad (Jonason et al., 2009; Paulhus & Williams, 2002).

Although we expect convergent evidence with mate value and Machiavellianism to substantiate our claim that playing hard-to-get is about affecting one's mating market forces, we expect sociosexuality—individual difference in people's attitudes, desires, and behaviours about casual sex—to offer discriminating evidence. That is, we expect individuals' willingness to have casual sex to be unrelated to playing hard-to-get to increase demand (Study 2). One who is promiscuous may be unlikely to attempt to alter market forces around them because of the potential risk involved with playing hard-to-get. That is, if sex is a priority in these people's lives, then playing hard-to-get may actually reduce their access to short-term sex. Although there might be long-term benefits for playing hard-to-get (e.g., obtaining higher-quality mates), people interested in casual sex do not often sustain lasting relationships (Jonason et al., 2009).

In four studies, we examine individual differences in playing hard-to-get through an adaptationist lens. In Studies 1 and 2, we describe the tactics, correlates, reasons, and potential consequences of playing hard-to-get. In Studies 3 and 4, we manipulate how often prospective mates go on dates with new people (i.e., an alternative conceptualization of playing hard-to-get) and examine people's interest in prospective mates as romantic relationship and casual sex partners and how much people will 'pay' (i.e., hours spent helping study and money spent on dinner) for prospective mates who vary in their availability.

STUDY 1

Playing hard-to-get is likely enacted through a range of different tactics, and these tactics should focus on creating the

impression of limited availability in prospective mates. Therefore, we use the act nomination (Study 1a) and act frequency (Study 1b) methods, which combine qualitative and quantitative methods (Buss & Craik, 1983). This technique has previously revealed playing hard-to-get as a mate attraction tactic but did not focus on any one tactic in detail (Buss, 1988; Fisher & Cox, 2010). We also expect women to use the associated acts to play hard-to-get than men will.

Study 1a: nomination of tactics

Method

Participants were 100 undergraduate psychology students¹ (60% women) at the El Paso Community College, Texas, who received extra credit for participation. Fifty-six percent of the sample was of Mexican descent, 40% was of European descent, and the remainder was of some other racial classification. Participants responded to a single, open-ended question: 'What behaviors do people perform when they "play hard-to-get" with others in terms of romantic/sexual relationships?' They completed this question in a paper-and-pencil format in a three-page document. Page 1 informed them of the nature of the study. Page 2 provided them with space to answer the question. Page 3 included the reported demographic questions and a debriefing.

Results and discussion

Three research assistants collated responses to the open-ended question. Items that were similar on the basis of face validity were eliminated. Responses that were unclear in meaning were discussed among the three research assistants who came to a consensus of what was meant (Bulmer, 1979), leaving 58 items (Table 1). In short, items reflected decreasing availability and minimizing contact as detailed later.

Study 1b: typicality of tactics

Method

Participants were 491 students (34% women) aged 18–45 years ($M = 20.38$, $SD = 3.89$) from the New Mexico State University who participated in exchange for partial course credit in their psychology class. Ninety-four percent described themselves as heterosexual, 3% as homosexual, and 3% as bisexual.² Thirty-eight percent described themselves as single, and 62% was involved in a serious romantic relationship (i.e., dating or married). Fifty-two percent of the sample was of European descent, 30% was of Mexican descent, 10% was of African descent, and the remainder was of some other racial classification.

Participants were informed of the nature of the study and completed a simple measure composed of three pages. Participants were asked to rate how often (1 = *not at all*; 5 = *very much*) they used each tactic gathered in Study 1a in the context of playing hard-to-get in romantic or sexual relationships. Next, participants were asked demographic questions. Last, participants were thanked and debriefed.

¹No comparisons were made by sexual orientation given the small sample.
²Results were invariant across sexual orientation, and thus, results were collapsed across that distinction.

Table 1. Descriptive statistics, sex differences (denoted with superscript letters), and factor loadings of the frequency of commission of acts associated with playing hard-to-get

	<i>M (SD)</i>	Factor loadings
Act confident	4.13 (1.13)	0.27
Talk to others	3.86 (1.23)	0.47
Withhold sex	3.71 (1.49) ^a	0.26
Act sarcastic but friendly	3.61 (1.37) ^a	0.34
Superficial conversation	3.59 (1.25)	0.41
Make others work to get them	3.57 (1.37) ^a	0.51
Give accidental physical contact	3.51 (1.36)	0.29
Be unpredictable	3.48 (1.29)	0.36
Keep conversation short	3.42 (1.24)	0.45
Make others chase	3.40 (1.38) ^a	0.57
Show attention to others	3.37 (1.25)	0.51
Act busier than you really are	3.25 (1.35)	0.57
Tease	3.24 (1.53) ^a	0.37
Look at you but then turn away	3.23 (1.33) ^a	0.30
Act like you are not attracted	3.18 (1.42)	0.46
Take time to respond	3.18 (1.23) ^a	0.48
Limit self-disclosure	3.15 (1.31)	0.49
Prioritize other things	3.14 (1.35)	0.51
Offer limited physical affection	3.14 (1.30) ^a	0.48
Sound busy	3.13 (1.34) ^a	0.61
Be responsive but slightly distant	3.10 (2.02)	0.38
Act like you do not care	3.10 (1.42)	0.56
Delay responding to calls	3.10 (1.37) ^a	0.53
Stay busy	3.10 (1.37) ^a	0.51
Give some attention then disappear	3.09 (1.34)	0.58
Delay responding to text messages	3.05 (1.41)	0.54
Do not call the next day	3.01 (1.51)	0.58
Have limited availability	3.01 (1.33) ^a	0.61
Be non-responsive to pick-up attempts	2.98 (1.39) ^a	0.49
Act uninterested	2.97 (1.31)	0.58
Play games	2.91 (1.45)	0.38
Flirt with others in plain sight	2.90 (1.46) ^a	0.50
Act non-committal	2.90 (1.41)	0.57
Remain at a distance	2.88 (1.24)	0.54
Appear unreachable	2.85 (1.37)	0.56
Be hard to get a hold of	2.85 (1.31)	0.62
Do not express many emotions	2.84 (1.36)	0.36
Show initial interest then it wanes	2.82 (1.26)	0.62
Ignore efforts to get her or his attention	2.77 (1.24)	0.59
Do not call	2.76 (1.47) ^a	0.59
Let the machine get the message	2.73 (1.42) ^a	0.58
Flirt but then stop suddenly	2.67 (1.38)	0.39
Seek attention but then disregard it	2.60 (1.34)	0.63
Offer limited witty conversation	2.57 (1.29)	0.43
Offer brief responses to questions	2.57 (1.24)	0.56
Do not talk a lot	2.54 (1.29) ^a	0.43
Act like you do not want to talk	2.54 (1.28)	0.58
Date others	2.51 (1.40)	0.38
Taunt	2.50 (1.44)	0.39
Feign disinterest	2.49 (1.21)	0.55
Turn down first few dates	2.48 (1.29) ^a	0.48
Do not give phone number	2.43 (1.40) ^a	0.48
String others along	2.41 (1.36)	0.51
Avoid contact	2.41 (1.27)	0.47
Say all the right things but do not call	2.38 (1.39) ^b	0.58
Cancel plans at the last minute	1.86 (1.22)	0.43
Be rude or snooty	1.50 (1.01) ^b	0.31
Treat others like s@#t	1.31 (0.83) ^b	0.25

Note: Values in bold are those items that have been retained after the first principal components analysis.

^aWomen scored higher than men.

^bMen scored higher than women.

Results and discussion

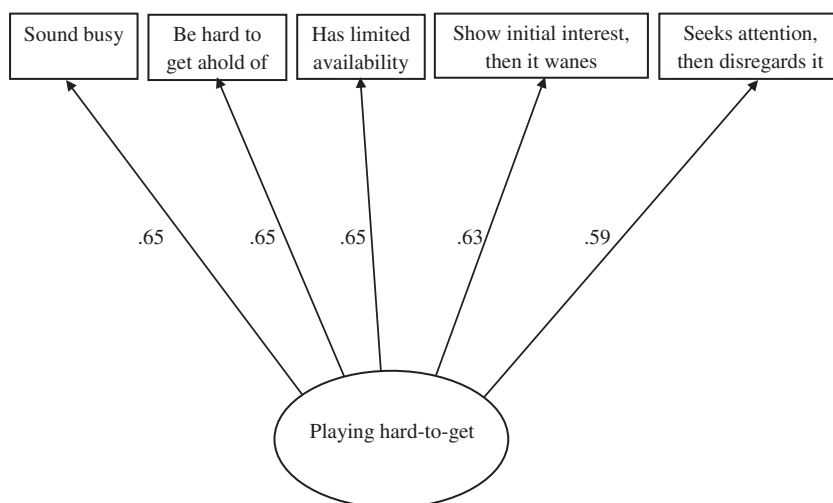
In Table 1, we report descriptive statistics for participants' ratings of how often they perform the items revealed in Study 1a. The two most commonly committed tactics were 'acting confident' and 'talks to others'. Both may reflect the greater perceived mate-value characteristic of those who might play hard-to-get. In a multivariate ANOVA with all the tactics as dependent variables, we found a significant, multivariate sex difference [Wilk's $\Lambda = .61$, $F(58, 346) = 3.85$, $p < .01$, $\eta_p^2 = .39$]. In Table 1, we denote the significant sex differences with superscript letters. Overall, the sexes were more alike than different in their use of the acts, but generally, when there were differences, women committed the acts more than men did ($ts = -1.96$ to -8.43 , $ps < .05$). For instance, women tended 'not to call', 'not talk a lot', and 'stay busy' more than men did. Men used only three tactics more than women did ($ts = 2.84$ to 4.60 , $ps < .01$): 'acting snooty or rude', 'saying all the right things but not calling', and 'treating others like s#@t'.

We envision playing hard-to-get as a strategy of tactics that reflect a general factor designed to increase the perception of scarcity—or decrease the perception of availability—of the user. We conducted a principal components analysis with oblique rotation on the 58 self-reported items asking participants how frequently they commit each playing hard-to-get tactic. The scree plot suggested a single-factor solution (eigenvalues for the first three factors = 13.91, 2.97, 2.46), and this factor accounted for 28% of the variance. To shorten the scale, we retained only those items that loaded $\geq .60$ (Table 1). When we re-ran the principal components analysis on the retained items, this single factor now accounted for 50% of the variance (eigenvalue = 2.50). The five retained items showed good internal consistency ($\alpha = .75$) for a scale composed of only five items (Carmines & Zeller, 1979). Next, to verify this one-dimensional structure, we used confirmatory factor analysis. We used the five items as indicators of a latent factor for playing hard-to-get. This model (Figure 1) returned a fair fit (root mean square error of approximation = .056, 95% confidence interval [.03, .09], comparative fit index = .97, incremental fit index = .97, normed fit index = .94, p -closeness = .32, $\chi^2(10) = 23.58$, $p < .01$, $\chi^2/df = 2.36$).

We collapsed the five items into a single index to find that men ($M = 2.78$, $SD = 0.88$) played hard-to-get slightly less ($t(411) = -1.64$, Cohen's $d = -0.17$) than women did ($M = 2.94$, $SD = 0.95$), suggesting that men and women do not differ overall in their playing hard-to-get rates but only differ in their adoption of certain tactics as noted earlier. This is not surprising in light of the few sex differences at the tactical level from earlier. This might also suggest that other individual differences besides the sex of the participant are important in understanding playing hard-to-get. We turn to other individual differences in Study 2.

STUDY 2: REASONS TO PLAY HARD-TO-GET

Study 1 suggests that although playing hard-to-get may be characterized by creating the impression of limited availability,



RMSEA = .056 (95% CI = .03-.09), CFI = .97, IFI = .97, NFI = .94, p -closeness = .32, $\chi^2(10) = 23.58, p < .01, \chi^2/df = 2.36$

Figure 1. Confirmatory factor analysis for a latent factor of playing hard-to-get. CFI, comparative fit index; CI, confidence interval; IFI, incremental fit index; NFI, normed fit index; RMSEA, root mean square error of approximation.

it was inductive and only gives a vague and inferred idea about why individuals might play hard-to-get. In contrast, in Study 2, we generate our own measures as to why people play hard-to-get with guidance from sexual economics and error management theory (EMT; Haselton & Buss, 2000). Sexual economics predicts that men and women might play hard-to-get to increase demand. This may have been revealed in Study 1 with items concerned with creating the impression that one is busy or has limited availability. In contrast, EMT predicts that women might play hard-to-get to test commitment in mates and to gain more information about them. EMT suggests that recurrent patterns of errors in decision making regarding the mating intentions of others may have selected for different tendencies in men and women. Men tend to commit type I errors ('false alarm'); they often perceive women's sexual interest in them when none exists because men pay a heavier cost for missed sexual opportunities than women. In contrast, women tend to commit type II errors ('miss'); they often fail to see men's commitment in them when it truly exists because women pay a heavier parental investment cost from having sex than men do. Such a motivation may have been alluded to in Study 1 in the tactic of making others chase or work to get them, an ostensible test of commitment.

In contrast, being currently unavailable because the person is dating someone else and there is not a relationship match should not characterize (conscious) reasons to play hard-to-get well. The former denotes actual limited availability not apparent limited availability (as revealed in Study 1). Actual limited availability is likely an unattractive mate quality; one probably does not want to waste her/his time with someone who cannot reciprocate. Therefore, this should not be a central reason to play hard-to-get. The latter reason simply denotes a mate who one is not interested in. People should not want to play hard-to-get towards a mate in which they are not interested. Instead, people use playing hard-to-get towards prospective mates that they are interested in, but it is performed

to manipulate the prospective mate to increase demand. Accordingly, we predict that Machiavellianism will be correlated with attempting to increase demand.

Method

Participants

Participants were 290 students (40% women) aged 18–55 years ($M = 22.42, SD = 6.15$) from the University of West Florida who participated in exchange for extra credit in their psychology courses. Ninety-two percent described themselves as heterosexual, 3% as homosexual, and 5% as bisexual.³ Fifty-two percent described themselves as single and 48% as involved in a serious relationship (i.e., dating or married). Forty-seven percent of the sample was of European descent, 22% was of African descent, 17% was of Hispanic descent, and the remainder was of some other racial classification.

Procedures and measures

We created five indices to measure different reasons to play hard-to-get. For each index, participants were asked how much they agreed (1 = *not at all*; 5 = *very much*) with various items asking how much each was a reason they played hard-to-get. The five indices measured the following: (i) *motivation to increase demand* (i.e., to make the person want me more, to make the person desire me more, to make the person 'need' me, to make the person more interested in me; Cronbach's $\alpha = .91$); (ii) *uncertainty* (i.e., I am unsure if I want to date the person, I have not made up my mind about dating the person, I am on the fence about the person; $\alpha = .94$); (iii) *currently dating others* (i.e., I am seeing someone else, I am dating others, I am dating someone else, I am more interested in someone else, I am trying to see whether

³Results were invariant across sexual orientation, and thus, results were collapsed across that distinction.

another relationship will go forward; $\alpha = .92$); (iv) *not thinking we match* (i.e., I am not that into the person, the person really does not 'do it for me', I do not think we are match; $\alpha = .92$); (v) *testing partner's willingness to commit* (i.e., to test their level of interest in me, to see if the person would keep pursuing me, to test the person, to test the person's willingness to commit to me; $\alpha = .91$).

The 22-item Mate Value Inventory was used (Kirsner, Figueredo, & Jacobs, 2003). Participants indicated agreement (1 = *not at all*; 7 = *very much*) with statements assessing their self-reported mate value (e.g., I am a person with a good sense of humour). Items were re-coded where necessary and averaged into an index ($\alpha = .82$).

The seven-item Sociosexuality Orientation Index was used (Simpson & Gangestad, 1991). Participants responded to questions such as 'I can imagine myself being comfortable and enjoying casual sex with different partners'. Individual Sociosexuality Orientation Index items were standardized (z -scored) prior to computing scale means and averaged ($\alpha = .76$).

The 12-item Dark Triad Dirty Dozen measure was used (Jonason & Webster, 2010). Participants were asked how much they agreed (1 = *not at all*; 5 = *very much*) with statements such as 'I tend to want others to admire me', 'I tend to lack remorse', and 'I have used deceit or lied to get my way'. These items were averaged together to create an index of narcissism ($\alpha = .82$), Machiavellianism ($\alpha = .78$), and psychopathy ($\alpha = .71$). The three traits were correlated with one another ($r_s = .36-.61$, $p_s < .01$).

In a descriptive fashion, we also measured the Big Five. The Ten-Item Personality Inventory (Gosling, Rentfrow, & Swann, 2003), a measure that asks two questions for each dimension of the Big Five, was used. Participants were asked, for instance, how much (1 = *not at all*; 5 = *very much*) they think of themselves as 'extraverted, enthusiastic' and 'quite, reserved' (reverse-scored) as measures of extraversion. Estimates of internal consistency returned low rates: extraversion ($\alpha = .65$), agreeableness ($\alpha = .29$), conscientiousness ($\alpha = .58$), emotional stability ($\alpha = .58$), and openness ($\alpha = .33$). Such rates are expected for short scales (Kline, 2000).

Results and discussion

A mixed-model ANOVA with reasons (within subjects) and participants' sex (between subjects) revealed that the five

reasons significantly differed in their importance for why people play hard-to-get [$F(4, 263) = 13.43$, $p < .01$, $\eta_p^2 = .05$]—the motivation to increase demand ($M = 2.88$, $SD = 1.18$; confirming that playing hard-to-get is about sexual economics) and testing commitment ($M = 2.85$, $SD = 1.17$; confirming EMT) were equally the most important. Uncertainty ($M = 2.71$, $SD = 1.15$) was lower than testing commitment. Dating others ($M = 2.39$, $SD = 1.21$) and not a match ($M = 2.46$, $SD = 1.21$) were the lowest. There were no sex differences or interactions with participants' sex, which limits the utility of EMT because the effects should be localized to women in reference to testing commitment.

In Table 2, we report correlations between the reasons to play hard-to-get and personality measures. Given the large number of tests, we reduced type I error by using p -values of .001 and .0001. Higher self-perceived mate value was associated with playing hard-to-get to increase demand and test commitment. Narcissism and Machiavellianism were correlated with playing hard-to-get to increase demand, to test commitment, and because one is dating others. When we controlled for the shared variance among the Dark Triad trait, most of the relationships became non-significant. The only case in which they did not was for *increasing demand* as the motivation to play hard-to-get. In this case, both Machiavellianism ($\beta = .26$, $t = 3.21$, $p < .01$) and narcissism ($\beta = .20$, $t = 2.85$, $p < .05$) but not psychopathy ($\beta = -.10$, $t = 1.45$) accounted for the unique variance ($R^2 = .14$) in the underlying motivation to playing hard-to-get to increase demand. This suggests that increasing demand might be part of being manipulative in mating contexts.

STUDY 3: DESIRABILITY AS A FUNCTION OF AVAILABILITY

Prior research has manipulated availability by modulating how often prospective mates go out on dates (Mathews et al., 1979; Walster et al., 1973). We predicted the following: (i) a highly available prospective mate would generally be desired for casual sex relationships; (ii) a moderately available prospective mate would generally be desired for a date and a serious romantic relationship; (iii) men would have a preference for highly available mates for a casual sex relationship; and (iv) women should especially want a prospective mate who is limited in his availability for a serious relationship.

Table 2. Correlations between reasons to play hard-to-get and personality measures in Study 2

Variables	MVI	SE	SOI	Big Five					Dark Triad		
				E	A	C	N	O	M	P	N
Increase demand	0.22**	0.04	0.06	0.04	0.04	0.11	-0.08	-0.01	0.33**	0.12	0.33**
Test commitment	0.20*	0.11	0.07	0.03	-0.07	0.14	-0.04	0.06	0.20*	0.10	0.25**
Uncertainty	0.07	0.03	0.10	-0.06	0.02	0.03	-0.03	0.16	0.14	0.14	0.04
Dating others	0.14	-0.02	0.18	0.04	0.01	-0.02	-0.01	0.12	0.19*	0.07	0.19*
Not a match	0.05	0.07	0.14	-0.00	0.02	-0.07	0.02	0.10	0.16	0.17	0.08

* $p < .001$,

** $p < .0001$.

Note: MVI, Mate Value Inventory; SE, self-esteem; SOI, sociosexuality; E, extraversion; A, agreeableness; N, neuroticism; O, openness; M, Machiavellianism; P, psychopathy; N, narcissism.

Method

Participants

Participants were 270 heterosexual students (65% women) aged 18–35 years ($M=19.66$, $SD=2.56$) from the New Mexico State University who participated in exchange for course credit in their psychology courses. We collected limited demographic information to attempt to maintain the cover story. Fifty-four percent of the sample was of European descent, 34% was of Mexican descent, 13% was of African descent, and the remainder was of some other racial classification.

Procedure

Participants were solicited to partake in a study relating to designing an online campus dating website. They were told that the Psychology Department was asked to help the designers of the system by checking to see if the computer algorithm designed to match members actually matched the ratings they, as participants, would provide. Therefore, they were asked to provide some simple demographic information (i.e., year in college, major, sex, age) and information regarding their exercise/health behaviours (i.e., number of times per week going to the gym, number of times per week going to the bar, how often drinking alcohol per week) and dating behaviour (i.e., how often one pays for a date's meal, number of times going out with friends per week, willingness to go out with someone who they just met).

Next, participants were presented with three folders, each marked with an A, B, or C on the front cover. They were told that 'these individuals were all pre-rated as attractive by other students but we want to see how decisions are made without the pictures'. In each folder was a profile of a prospective mate who had presented the same information (age 19 or 20, a social science major of some kind) as the participants had done so earlier. However, the information here was manipulated in accordance with prior work (Mathews et al., 1979; Walster et al., 1973) to create three prospective mates who were essentially identical in all respects except the degree to which the individual goes out with someone they just met (1 = *never*; 2 = *occasionally*; 3 = *often*) and their sex (each participant viewed opposite-sex profiles). Folder A contained a highly available prospective mate who *often* dated those he or she just met. Folder B contained a moderately available mate who *occasionally* dated those she or he just met. Folder C contained a highly unavailable mate who *never* dated those he or she just met.

Accompanying the folders, a brief measure was given to participants, in which they were instructed to refer to the folders for their answers. Participants were asked three forced-choice questions. They were asked to choose (with replacement) one of the three folders for a date, a casual sex partner, and a committed romantic relationship. Upon completion of these items, participants were thanked and debriefed.

Results and discussion

First, we examined the choices participants made for the three prospective mates for each of the three relationship types. Figure 2 shows the percentages for which participants

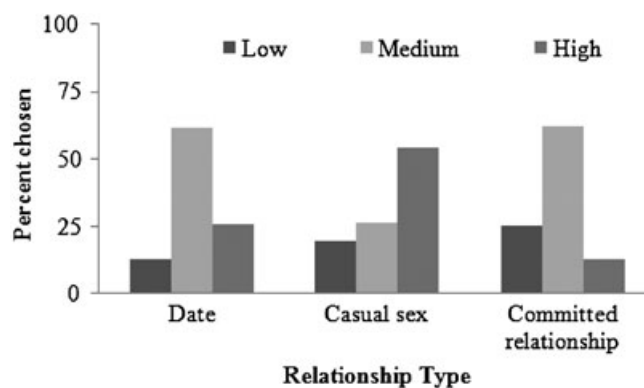


Figure 2. Percent prospective mates chosen for different relationships according to degree of availability (low, medium, high) in Study 3.

chose the three prospective mates for each relationship type. All three returned significant differences. For dating ($\chi^2(2)=103.47$, $p < .01$) and committed romantic relationships ($\chi^2(2)=104.87$, $p < .01$), the prospective mate who was medium in availability was preferred. In contrast, the highly available prospective mate was preferred for a casual sex relationship ($\chi^2(2)=54.07$, $p < .01$).

Next, we compared which of the three prospective mates the participants chose for each relationship type as a function of participant's sex. In Figure 3, we present the percentages men and women chose the prospective mates for each relationship type. Men and women did not differ in their preferences for prospective mates for a date (Figure 3, top panel; $\chi^2(2)=2.99$, $\Phi = .11$). However, men preferred the highly available prospective mate for a casual sex partner more than women, whereas women preferred both the medium-availability and low-availability prospective mates for casual sex more than men (Figure 3, middle panel; $\chi^2(2)=12.63$, $p < .01$, $\Phi = .22$). Nevertheless, for both sexes, the highly available prospective mate was preferred for casual sex. Women preferred a prospective mate who was medium in availability for committed romantic relationships, whereas men preferred low-availability mates for committed romantic relationships (Figure 3, bottom panel; $\chi^2(2)=14.73$, $p < .01$, $\Phi = .23$).

Importantly, results reveal the predicted the inverted-U function in relationships of a more serious nature (i.e., dating and serious romantic relationships) but the negative linear function in the casual sex context. It may be that individuals are unwilling to expend considerable effort for casual sex partners given the low return rates of engaging in such a relationship, whereas in relationships that are more serious, individuals prioritize prospective mates who may embody the proper mixture of mate value and availability. These functions were further moderated by the sex of the participant, revealing different priorities in men and women as a function of mating duration and availability. This might imply that a viable reason for previous studies reporting a lack of a playing hard-to-get effect was an artefact of not considering mating duration, assessing only interest in going on a date with the prospective mate (Scott, 2009; Walster et al., 1973).

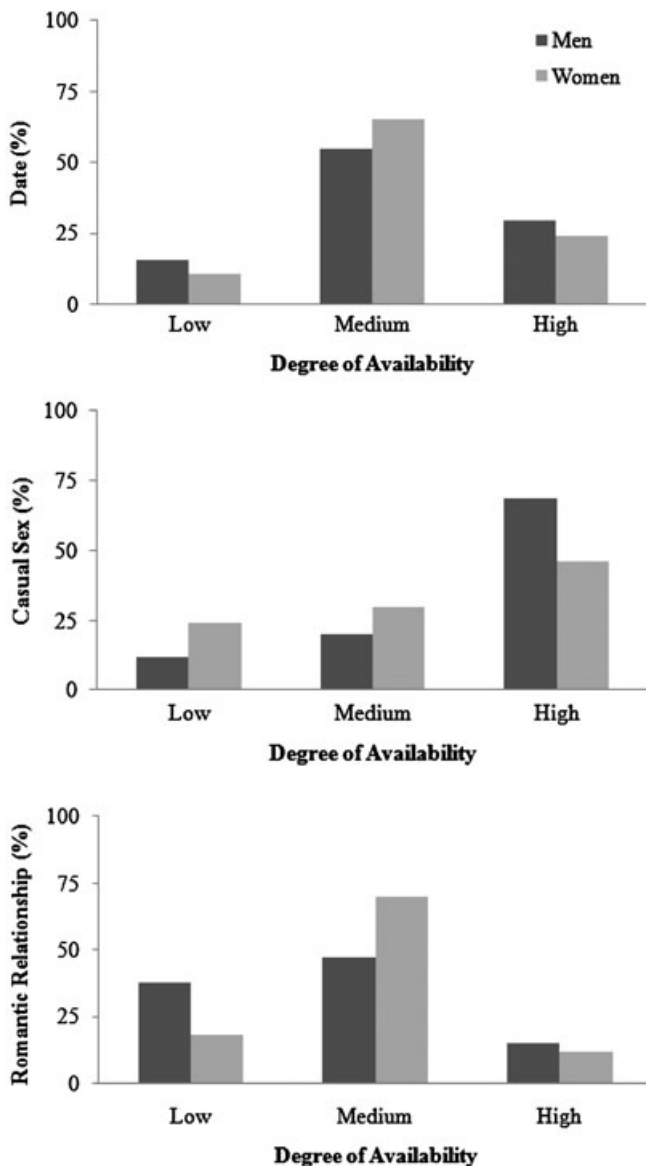


Figure 3. Percent prospective mates chosen for different relationships according to degree of availability (low, medium, high) and the sex of the participant in Study 3.

STUDY 4: INCREASED VALUE AS A FUNCTION OF AVAILABILITY

In a competitive market, when demand outstrips supply, buyers should not only regard the underlying product as more desirable but also be willing to pay a higher price to obtain it. Accordingly, we ran Study 4 to see if participants would be willing to spend more hypothetical time and money for a potential mate who was less available than for one who was more available. Again, we manipulate the perceived availability of particular mates.

Method

Participants

Participants were 425 students (53% women) aged 18–50 years ($M = 20.41$, $SD = 3.93$) from the University of South Alabama

who participated in exchange for extra credit in their psychology course. The racial breakdown of the participants was 59% White, 25% Black, and some other racial category for the remainder. Fifty-three percent of the sample was single, and 47% was involved in a serious relationship (including married). Ninety-four percent of the sample was heterosexual, 4% was bisexual, and fewer than 2% was homosexual.⁴

Measures and procedure

Participants completed a two-page survey that manipulated the availability of a prospective mate as we did earlier in Study 3 but in a between-subjects fashion (between 135 and 151 people randomly assigned to one of three levels for availability). First, they read and signed an informed consent. Second, they were given a black-and-white headshot (six photos, in counterbalanced orders of presentation) of an opposite-sex prospective mate who had been pre-rated as physically attractive but varied on described availability. The pictures were taken from a website where individuals post pictures and others rate them on a scale of 1–10, with 10 being highly attractive. Attractive photos received a rating of 9.5 or above, and the unattractive photos received a 6–7; both had to have been rated by at least 100 people. The pictures were chosen according to their ratings as they came up in the rating process, whether they were headshots, and they were not from the southeastern USA to remove potential familiarity effects. Third, they were asked to choose what kind of restaurant they would be willing to take this person to [fast-food ($\approx \$10$), casual dining ($\approx \30), sushi ($\approx \$50$), fine dining ($\approx \70)], to choose the maximum money (US\$) they would spend on the prospective mate for dinner, and 'how much time, in hours, would you be willing to invest in helping this person in order to go out with them'. Third, participants reported demographic information as reported previously. Last, participants were debriefed and thanked for participation.

Results and discussion

In a 2 (male, female) \times 3 (low, medium, high availability) ANOVA, we treated restaurant choice (by price) as a dependent variable. Individuals were willing to take the low-availability prospective mate ($M = 30.53$, $SD = 9.22$) to more expensive restaurants than the medium-availability ($M = 23.33$, $SD = 12.16$) or high-availability ($M = 22.74$, $SD = 11.62$) prospective mate [$F(2, 423) = 21.37$, $p < .01$, $\eta_p^2 = .09$], with no difference between the latter two. Men ($M = 28.21$, $SD = 12.03$) were more willing [$F(1, 423) = 16.81$, $p < .01$, $\eta_p^2 = .04$] to take the prospective mate, regardless of their availability, to more expensive restaurants than women were ($M = 23.45$, $SD = 10.66$). However, these two main effects were moderated by an interaction [$F(2, 423) = 3.29$, $p < .05$, $\eta_p^2 = .02$; Figure 4]. Although the prospective mate who was low on availability was the most desired and the

⁴Results were invariant across sexual orientation, and thus, results were collapsed across that distinction.

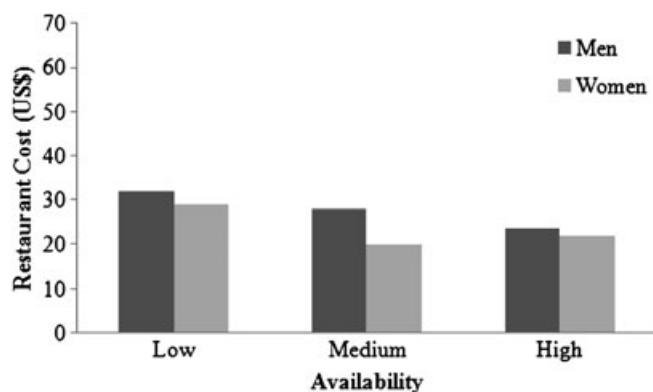


Figure 4. Interaction of sex of the participant and availability (low, medium, high) predicting the cost of restaurants participants were willing to take prospective mates to in Study 4.

high-availability prospective mate was the least desired, the sexes did not differ in the amount of money they were willing to spend for dinner with the prospective mate. In contrast, men were willing to spend significantly more money than women were for a prospective mate who was medium in availability.

We repeated this analysis for the maximum number of US dollars participants were willing to spend on dinner and replicated the main effects for availability [$F(2, 420) = 10.47, p < .01, \eta_p^2 = .05$] and the sex of the participant [$F(1, 410) = 45.59, p < .01, \eta_p^2 = .10$], but the interaction was not significant. The high-availability, medium-availability, and low-availability prospective mates were worth \$33.10 ($SD = 20.64$), \$34.99 ($SD = 24.25$), and \$44.45 ($SD = 20.10$), respectively. Men would spend \$38.85 ($SD = 22.78$), \$45.60 ($SD = 29.14$), and \$50.14 ($SD = 21.56$) on high-availability, medium-availability, and low-availability mates, respectively. Women would spend \$28.07 ($SD = 17.21$), \$27.19 ($SD = 16.10$), and \$38.31 ($SD = 16.49$) on high-availability, medium-availability, and low-availability mates, respectively.

We then repeated this analysis for time (hours) one would spend. There was a main effect for participants' sex [$F(1, 417) = 7.43, p < .01, \eta_p^2 = .02$]. Men would spend 2.71 hours ($SD = 5.05$), 2.48 hours ($SD = 3.11$), and 3.56 hours ($SD = 6.26$) helping high-availability, medium-availability, and low-availability mates, respectively. Women would spend 1.62 hours ($SD = 1.56$), 1.74 hours ($SD = 1.75$), and 2.36 hours ($SD = 2.41$) helping high-availability, medium-availability, and low-availability mates, respectively. However, there was no main effect for a prospective mate's availability on hours willing to invest or an interaction of sex and availability. We thought that this might be a function of skew in the report of hours willing to be spent ($skewness = 8.05, kurtosis = 79.51$). Therefore, we replicated the analysis but used a log-transformed version of hours invested. We found that individuals were willing to spend more time [$F(2, 376) = 4.24, p < .05, \eta_p^2 = .02$] helping the low-availability prospective mate ($M = 0.67, SD = 0.70$) than the medium-availability ($M = 0.61, SD = 0.75$) or high-availability ($M = 0.57, SD = 0.65$) prospective mates, with no difference between the latter two. Men ($M = 0.80, SD = 0.68$) were willing to spend more time [$F(1, 376) = 12.23, p < .01, \eta_p^2 = .03$] helping the low-availability female prospective mates

($M = 0.67, SD = 0.70$) than women ($M = 0.55, SD = 0.70$) were willing to help male prospective mates.

Overall, men spent less money on more available prospective mates, suggesting that they allocate their resources to mates who have less availability and ostensibly more value in the market. Interestingly, women were willing to spend the least amount of money on the medium-availability mate. This might be because this is the kind of mate she ideally wants. He is one who is limited in availability, denoting his value, but he is not a wasted effort like the highly unavailable prospective mate. By spending less money on this mate, she may be allowing him the opportunity to prove his interest in her and, therefore, encourage the formation of a mutually satisfactory pair bond. Women's spending on the low-availability and high-availability prospective mates may denote frivolity in their choices; women might be willing to spend money because they are interested in such mates for 'fun'.

GENERAL DISCUSSION

For years, researchers have studied the mating strategy of playing hard-to-get (Eastwick et al., 2007; Walster et al., 1973; Whitchurch et al., 2011). They have provided explanations of *how* playing hard-to-get might work but have had more difficulty explaining *why* it works as it does. In the present research, we have provided the first account of playing hard-to-get using an evolutionary paradigm, specifically, sexual economics. In so doing, we examined sex differences and similarities, context-specific effects, and reasons to play hard-to-get and identified tactics associated with playing hard-to-get and personality correlates. We contend that playing hard-to-get is a specific mating tactic that could relate to a broader range of mating strategies (Buss, 1988) and is used to differing degrees by different individuals as evidenced in sex differences and personality correlates. Playing hard-to-get may be one strategy that reflects the modulation of perceptions of one's availability to facilitate one's more general mating strategy of attempting to obtain the best mate with the greatest commitment one can.

In Study 1, we showed that playing hard-to-get was characterized by minimizing contact or appearing unavailable, providing a much-needed definition of playing hard-to-get (Scott, 2009). Consistent with our evolutionary-based predictions, women enacted more tactics with the intent of playing hard-to-get than men did. This could be because either women are trying to learn more information about potential mates or men pay a heavier cost in terms of lost sexual opportunities by playing hard-to-get. Alternatively, it could be an American or Western norm that men court women and women should play hard-to-get. Future work will need to assess the role of limited availability in non-American/Western samples. Nevertheless, men and women were more alike than different in enacting different tactics associated with playing hard-to-get.

In Study 2, we examined the reasons individuals play hard-to-get and how personality traits relate to those reasons. The primary reasons people played hard-to-get related to increasing demand, consistent with economic models and

uncertainty, which may be consistent with EMT, but the sexes did not differ in their self-reported reasons to play hard-to-get despite evidence that men and women have somewhat different sexual psychologies (Buss & Schmitt, 1993; Kenrick et al., 1993; Li & Kenrick, 2006). We feel that there is no reason to expect men and women to differ on the reasons they limit their availability, but instead, they should differ on how often they use such tactics as we found in Study 1b. These tactics are used in the real world where their behaviour can be constrained by other agents. Both sexes can benefit from increasing their value in the market. More demand may reduce paternity uncertainty, infidelity threats, and other potential relationship problems. In addition, in Study 2, we detailed personality correlates. Two in particular stands out: people who were manipulative (i.e., Machiavellian) and of greater value (i.e., self-reported mate value) played hard-to-get to increase demand, which was the most face-valid assessment of reasons to play hard-to-get predicted by sexual economics. Increasing demand likely requires one to manipulate the market forces surrounding them but comes with the risk of losing mating opportunities and thus these correlations. Playing hard-to-get may be part of the exploitative mating strategy enacted by those high on the Dark Triad (Jonason et al., 2009) or the 'game-playing' or *ludic* love style that characterizes those high in Machiavellianism (Jonason & Kavanagh, 2010).

In Study 3, we showed evidence of a context-specific inverted-U function and how participants' sex moderated this effect. Men desired a serious relationship partner who was low on availability more than women did, but it was women who desired the same mate for a casual sex partner more than men did. This highlights the asymmetries in male and female sexual psychologies that result from different levels of minimum obligation to offspring (Buss & Schmitt, 1993; Trivers, 1972). Because a woman risks more in her sexual relationships than men do (i.e., pregnancy costs), she should want a mate who has higher value and is unlikely to leave her saddled with an offspring. Being a good investment as a mate may be advertised through limited availability. This may also be why popular press books teaching men the 'pick-up arts' advocate that they cultivate a hard-to-get persona so that women will chase them (Louis & Copeland, 2007). Women prefer a highly unavailable man for a casual sex relationship. In contrast, because men have an interest in finding low-cost sexual access (Kenrick et al., 1993), they prefer casual sex partners who are highly available.

In Study 4, we showed that increased value was associated with limited supply. This could be consistent with economic models because people were willing to 'pay' more for less available mates. It could also be consistent with another theory—reactance—which suggests that the deprivation of a sexual option makes one want that option more (Baumeister, Catanese, & Wallace, 2002; Brehm & Brehm, 1981; Wright et al., 1992). However, we feel that sexual economics may be a better theory despite recent attempts to revive reactance (Chadee, 2011) because sexual economics does the following: (i) provides *a priori* reasons to make predictions; (ii) is linked to a set of strong assumptions offered by evolutionary theory; and (iii) can account for effects of

reactance (e.g., forbidden fruit). That is, in Study 4, we did not reveal the inverted-U function but, instead, revealed that the more unavailable a person is, the more people are willing to invest in them. The lack of the inverted U could be the result of the following: (i) the between-subjects method might not allow for relative comparisons among prospective mates (Study 3); (ii) the inverted-U might be specific to mating decisions and not expenditure; and (iii) the fact that participants answered questions about how much time and money they would spend might imply that they actually do have a chance with the prospective mate. Disentangling these issues deserves more attention.

Limitations and future directions

Although there are some strengths of our research, there is room for improvement. First, we relied on simple methods such as the person-perception and the dating-service paradigms for logistical reasons. Second, because we relied on undergraduate samples, our findings might not generalize to broader populations. For example, college students may have limited funds, suppressing our monetary results in Study 4. Third, we used a series of brief measures in Study 2. Brief measures can suffer from loss of content while measuring heterogeneous constructs. Future work might also attempt to understand who—in terms of individual differences—plays hard-to-get.

Fourth, we failed to take into account mating duration in Studies 1 and 2. Although we have no reason to predict specific differences, it is possible that tactics for playing hard-to-get differ as a function of mating duration. We felt that altering mating dynamics through limiting availability had a singular effect to increase demand, but it is also possible that the effect is more sophisticated than that. This might account for the fair fit we found in our confirmatory factor analysis and the limited evidence for sex differences in Study 1b, which itself needs further refinement and validity tests to follow. Instead, we felt it more important to alter the temporal context in Studies 3 and 4 because, like in studies on mate choice (Buss & Schmitt, 1993; Li et al., 2002), people would be making mating decisions across different contexts. Alternatively, we may have been too reliant on an overly simplified concept of human sexual relationships (Buss & Schmitt, 1993). There are other types of relationships that do not fit well into the dichotomy of short- and long term (Jonason, Valentine, & Li, 2012). Future work might also examine how playing hard-to-get functions in various relationship contexts.

More work is needed to extend the role of supply-side economics in mating dynamics. First, we have researched only playing hard-to-get to make our case for the role of limited availability in mating dynamics. Future work could directly test whether a mate who plays hard-to-get actually has a competitive advantage in the mating market. Our manipulation in Studies 3 and 4 has been used by playing hard-to-get researchers, but it might only assess one's interest in a prospective mate's sociosexuality. In addition, studies with more sophisticated methods would be useful. For example, researchers could have participants interact with a

confederate who then gets the participants' phone number and has to call in 1 or 4 days, thereby varying availability in an alternative way. Last, we only concerned ourselves with perceived availability. In contrast, objective supply, like the operational sex ratio, may be more easily or appropriately modelled with classic supply-and-demand reasoning and may actually have driven the evolution of mate perception mechanisms. Future work might manipulate actual supply and measure the resulting demand.

CONCLUSIONS

We have demonstrated how supply-side economics and evolutionary psychology can help account for mating dynamics and not just mate preferences. We showed how limiting perceived availability has the following characteristics: (i) is at the core of playing hard-to-get; (ii) is performed more by women than men (although the reasons to do so do not differ across the sexes); (iii) is heavily informed by evolutionary and economic models of mating psychology; (iv) is related to the mate value individuals have on the market; and (v) is part of a 'game-playing' love style that characterizes those high on Machiavellianism. It seems as though your grandmother's advice might be true: absence may indeed make the heart grow fonder.

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