

A Life History Theoretical Perspective on Mate Selection

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ABSTRACT. Life history theory suggests that early childhood environments lead to the development of different reproductive strategies to optimize reproductive success. We used a life history theoretical perspective to investigate whether early life experiences (stable vs. unstable family environments) influence what women find attractive in a potential mate. Using an online face perception task, women reported perceptions of traits and attraction to male faces. Life history strategy was operationalized in 2 ways: (a) the Mini-K Short Form self-report measure and (b) the contact or absence of a father during childhood. We hypothesized that women employing a faster life history strategy would be more attracted to men who have facial features reflecting more masculine traits, which have been linked to testosterone and signal high genetic quality. We also hypothesized that women employing a slower life history strategy would be more attracted to men who have facial features reflecting traits associated with high parental investment. Consistent with our hypothesis, those on a faster life history track rated masculine male faces as more attractive ($\beta = .13, p < .001$), and those employing a slower life history strategy reported more attraction to men with high feminine traits ($\beta = .31, p < .001$). This suggests that women employing a faster life history strategy favor men who show signs of high genetic quality (masculine traits) and little cues of parental investment, possibly subjecting these women to adverse life and relationship outcomes. Strategies for more precisely studying the link between life history and mate selection are discussed.

Evolutionary psychologists have suggested that humans should have developed specific psychological mechanisms that solve the adaptive and important problem of selecting a mate (Cosmides & Tooby, 1994). Choosing mates who provide good genes and high parental investment in their children is associated with reproductive success and the spread of one's genes into the next generation. Because women tend to bear the majority of the burden of reproduction, they have been known to select mates with more caution (Johnstone, Reynolds, & Deutsch, 1996). But what strategies do women use to facilitate their reproductive success?

There are multiple and sometimes competing

processes that contribute to variation in reproductive strategies in women, some of which may be conscious and others unconscious. For example, Penton-Voak, Jacobson, and Trivers (2004) proposed that specific cues from a woman's environment can trigger the early onset of reproductive behavior. Their study focused on noteworthy variation in reproductive timing; those born into more stressful environments tend to engage in courtship and reproductive behavior earlier in life. However, their research does not address variation in the types of mates that women may select. We proposed that variations in reproductive strategy should be revealed in predictable patterns of mate attraction and selection, and we began to

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explore this question using a life history theoretical framework.

Life History Theory

Originally developed by evolutionary biologists and behavioral ecologists to address between-species variation in reproductive strategy (Clutton-Brock, 1991), life history theory suggests that, due to finite energy and resources, organisms must decide where to invest their time (i.e., to either reproduce early in life or to collect resources, grow, and delay reproduction; Chisholm, 1999). Life history theory proposes that, all else being equal, species or organisms living in unstable and unpredictable environments evolve clusters of traits associated with high reproductive rates (having many offspring) and low parental investment called a fast strategy. In contrast, species or organisms living in relatively stable environments evolve clusters of traits associated with lower reproductive rates (having few offspring) and high parental investment called a slow strategy (Chisholm, 1999).

Differential costs of reproduction. Throughout humanity's evolutionary past, different selection pressures have acted on men and women, creating distinct psychological modules that help men and women discriminate between potential mates (Cosmides & Tooby, 1994). Women must gestate, lactate, and invest in their young to increase their reproductive fitness. Therefore, because women incur many costs such as pregnancy, time, and energy, they have become more discriminating when choosing a potential mate and are often referred to as "the choosier sex" (Johnstone et al., 1996). Researchers have suggested that strong selection pressures would have acted to ensure that women were able to discriminate and find a mate who would increase their reproductive success, although the strategy they use to increase reproductive success varies with life history strategy.

Stressful life environments. There are some suggestions as to what constitutes an unpredictable or stressful childhood environment. In humans, stressful environmental cues such as variation in life expectancy, violent crime rates, and unreliable attachment figures are all associated with both psychological (Chisholm, Quinlivan, Petersen, & Coall, 2005) and physiological (Draper & Harpending, 1982) indexes of a faster life history strategy. One early study determined that father absence, as an indicator of stressful early environments, predisposed women toward early reproduction by predicting the onset of menarche

by an average of six months earlier compared to women whose fathers were present during childhood (Draper & Harpending, 1982).

Draper and Harpending (1982) theorized that natural selection has created mechanisms in women that can be turned on to encourage early reproduction. Father absence, throughout humanity's evolutionary past, was a strong indicator of high offspring mortality rates because paternal investment and protection was vital to having enough resources to survive. With the early onset of menarche in high mortality and unstable early environments, natural selection could be setting women on a trajectory that could lead them to early reproductive careers and potentially higher reproductive success. Other studies have shown that insecure attachment to parents can also predict early menarche and the onset of first sexual debut in women (Belsky, Steinberg, & Draper, 1991).

In summary, prior studies have shown that early environmental stress such as father absence and an insecure early childhood environment predicts whether women mate early in life (fast strategy) or delay reproduction (slow strategy), but what about mate preferences? Does early environmental stress also predict the types of mates that women are likely to choose? Based on the preceding literature, we reasoned that differences in fast and slow reproductive strategies would also be reflected in the types of mates that women find most attractive.

Mate Preferences

Many factors affect what men and women find attractive. For example, both men and women find symmetrical faces more attractive because symmetry has been a reliable indicator of good health and immune functioning throughout humanity's evolutionary past (Langlois, Roggman, & Musselman, 1994; Rhodes, Sumich, & Byatt, 1999). Men and women also show preferences for people with more feminine facial features. Having more feminine features has been linked with perceptions of kindness, trustworthiness, and parental investment (Penton-Voak et al., 2004).

Variation in attraction. Despite these general trends, there is much variation in which faces women find more attractive. For example, depending on hormones and goal-oriented motivations, women may differentially prefer faces varying on masculinity. During ovulation, when women are highly fertile, they show preferences for men with more masculine facial features that are associated with the immune suppressing hormone,

testosterone (Jones et al., 2005). Masculine-looking men, by virtue of being able to maintain such an immune suppressing hormone, are thought to have higher functioning immune systems and are found highly attractive to ovulating women who may be looking for good genes (Fink & Penton-Voak, 2002). In contrast, when they are not ovulating, women show preferences for men with more feminine facial features who are likely to be high in parental investment and look kind and caring. Moreover, biological processes have also been shown to be sensitive to current environmental conditions. For example, when reminded of their own death or mortality, women report a shift in attraction to more masculine looking faces as well (Vaughn, Bradley, Byrd-Craven, & Kennison, 2010).

In summary, these studies have suggested that, although women vary in the degree to which they value specific traits in men, there may be systematic differences in the extent to which they find masculine, dominant faces attractive. We sought to apply life history theory to address these systematic variations. If women with different early life experiences employ different reproductive strategies to increase reproductive success, would they be attracted to different kinds of men who might help them reach their goals?

Life history's influence on mate preference.

Life history theory suggests that humans are born with psychological mechanisms that help them solve adaptive problems and, ultimately, help them maximize their reproductive success. Variables such as a father's absence during the fundamental years of his daughter's development could subconsciously suggest to his daughter that pair-bonding is unstable in their environment. This might warn her that parental investment will be low in her future as well. As a result, we predicted that daughters or women raised in father absent environments may prioritize signs of genetic quality (vs. signs of paternal investment) in a mate to ensure that they at least have healthy offspring given that they cannot depend on men in their communities for paternal investment.

There has been limited evidence for this idea. Penton-Voak et al. (2004) compared the mate preferences of Jamaican versus British women and found that Jamaican women preferred male faces that were more masculine with traits that may indicate high genetic quality. In contrast, women from Britain were attracted to men with softer traits that may indicate that these men would make good long-term partners and parents. They reasoned that

Jamaican women had a faster life history strategy because many Jamaican families have absent fathers and high levels of parasites in their environments, which leads to higher mortality rates. In turn, these higher mortality rates may signal women to employ a faster reproductive strategy, possibly guiding their mate preferences for men with more masculine features. We suggested that clues from the environment such as low parental investment or high pathogen levels may unconsciously signal women to prioritize masculine male faces that may indicate high genetic quality and good health, rather than feminized male faces that may indicate long-term paternal investment.

The study by Penton-Voak et al. (2004) focused on between-culture differences in mate preferences. The authors suggested that the observed differences between Jamaican and British women may be due to differences in environmental stress (greater stress in Jamaica). There are many differences between Jamaican and British cultures, and many alternative explanations for between-culture differences in mate preferences. Therefore, it is important to provide a more direct test of the association between early environmental stress (life history strategy) and mate preferences by studying variations in mate preferences within a specific culture. In the current study, we investigated the possibility that within-culture variation in mate preferences may be shaped by differences in early life experiences.

One Approach: Face Perception

One common way to assess mate preferences is by using a face perception task. In a typical face perception paradigm, participants are presented with a series of faces and asked to rate them on various personality and physical characteristics. Face perception studies have demonstrated that the face is a reliable resource when it comes to assessing traits such as social dominance and aggressiveness (Dabbs & Morris, 1990); agreeableness and extraversion (Baron-Cohen, Knickmeyer, & Belmonte, 2005); and honesty, kindness, and warmth (Berry & Brownlow, 1989). Traits such as dominance and aggressiveness are particularly easy for raters to identify, and have been linked to the hormone, testosterone (Dabbs & Dabbs, 2000). Testosterone is reliably associated with physical characteristics in men such as facial hair, enlarged cheekbones, and a defined jaw that are often seen as attractive (Cunningham, Barbee, & Pike, 1990). However, testosterone is also associated with negative behavioral

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traits such as low social sensitivity (Baron-Cohen et al., 2005), emotional containment, emotional flooding, and even rage (Dabbs & Dabbs, 2000), all of which can lead to poor communication and negative consequences in close relationships. These personality characteristics can make for a dominant mate who might be a good leader and may display markers of good genes. However, it might also predict low parental investment and bad parenting skills. Moreover, traits that are associated with parental investment are inversely related to traits related to mating effort. In a different study, Kruger (2006) found that participants associated mating effort with masculinized faces, and parenting effort with feminized faces, suggesting that facial cues may reveal important information about someone's personality.

The Present Study

In the present research, we investigated how a woman's life history strategy predicted the types of men she would find attractive as an adult. We predicted that women who used the fast strategy would prioritize cues of genetic quality (masculine facial features) over cues of parental investment (feminine facial features) when looking for a short-term or long-term mate. More specifically, we hypothesized that women who used a faster life history strategy would report more attraction to male faces that are perceived to be higher in masculine traits, which we labeled as *hard traits* (i.e., masculinity, dominance, and aggression). We also hypothesized that women who used a slower life history strategy would give higher attraction ratings to male faces that are perceived to be higher in traits related to parental investment, which we labeled *soft traits* (i.e., caring, supportive, trustworthy, and kind).

To test these hypotheses, we had young adult women participate in a study where they completed background questionnaires designed to assess the psychological correlates of their life history strategy. They then viewed a series of photographs of young adult men, rated each photo on a series of hard (masculine) and soft (feminine) traits, and reported on attraction to the targets as short-term and long-term mates.

Method

Participants

Seventy-nine female participants were recruited and paid through Amazon Mechanical Turk™ (MTurk), but 18 had to be removed for incomplete

measures, leaving a total of 61 participants. Most participants reported being heterosexual (87%); the rest identified as bisexual (13%). Approximately 69% of our sample was European American, 18% was Asian, and 13% reported being from other racial backgrounds. Participants ranged in age from 19 to 40 years with a mean of 27.5 ($SD = 3.7$). As a proxy for socioeconomic status, participants were asked to report their own and their parents' level of education. All participants reported having at least a high school diploma, and 64% reported a postsecondary degree. Most mothers and fathers had a high school diploma, and approximately 36% had a post-secondary degree. Thus, our sample was, on average, fairly well-educated.

Design

The present study used a mixed between- and within-subjects design. The between-subjects variable was *life history strategy*, which was assessed with two different measures. One was a multi-item scale, the Mini-K Short Form, (Mini-K; described below), and the other was a dichotomous variable indicating the contact or absence of father during childhood. The within-subjects variable was the perceptions of traits for each of the 45 photographs. We had two sets of trait ratings: soft traits (masculine traits) and hard traits (feminine traits). The dependent variable was the level of attraction as a short-term (sex and dating) vs. long-term (coparent and spouse) partner, which was rated for each of the 45 photographs. This research design resulted in multilevel data. At Level 1, we had each participant's trait ratings and attraction ratings for 45 photographs. At Level 2, we had each person's life history strategy. We analyzed the data using multilevel modeling.

Procedure

After institutional review board approval was given (13-0349), participants completed a 1-hr study to rate photos on a variety of personality traits. They were given instructions on MTurk and directed to a link that would open up the survey on Qualtrics® online survey software. Participants were asked to rate 45 male faces twice: the first time on a variety of personality traits and the second time on how attractive they found the person as a potential partner in various types of relationships (sex partner, spouse, and so on). Participants completed a background questionnaire to assess the stability of their environment, and therefore, their life history strategy. Participants were then thanked for their

participation and paid, and all guidelines for the ethical treatment of human subjects as set by the university and the American Psychological Association were followed throughout the study.

Stimuli. Participants were presented with photographs of 45 male faces. Most of these men were European American followed by Hispanic, Asian, and other ethnicities. They ranged in age from 18 to 34 and had a mean age of 21.8 ($SD = 2.8$). The photographs used in the present study were part of a larger investigation of face perception and caregiving behavior. For this reason, the 45 male photographs were screenshots taken from video data of male caregivers, acquired from a prior study of young adult couples. The still images were all selected to reflect the most neutral expression possible from the video clips and were edited to be approximately the same size and resolution.

Photograph ratings. Participants rated 45 male faces on a series of 14 traits: kind, warm, understanding, responsive to close others, trustworthy, assertive, masculine, feminine, dominant, friendly, physically attractive, caring, aggressive, supportive, and strong. Ratings ranged from 1 (*less than the average man*) to 5 (*more than the average man*). Three traits associated with testosterone (masculinity, dominance, and aggression; Dabbs & Morris, 1990) were averaged to form a composite representing hard traits ($\alpha = .77$). Four traits associated with good parental investment (caring, supportive, trustworthy, and kind) were averaged to form a composite representing soft traits ($\alpha = .87$). Participants then rated how attracted they were to each target in terms of six types of relationships: (a) a sex partner, (b) dating partner, (c) spouse, (d) coparent, (e) friend, and (f) coworker. Their ratings varied from 1 (*not at all attractive*) to 5 (*very attractive*). A *short-term mating composite* was created by averaging their attraction ratings for dating partner and sex partner ($r = .88$), and a *long-term mating composite* was formed by averaging their attraction ratings for spouse and coparent ($r = .83$).

Life history measures. We used two measures to assess life history. First, we included a validated life history questionnaire called the Mini-K (Figueredo et al., 2006). This measure is part of a larger battery of measures of life history called the Arizona Life History Battery (Figueredo, 2007). This larger set of measures assesses a number of validated psychological and behavioral correlates of life history strategy such as insight and planning, attachment, social contact, and support. The Mini-K consists of a few items targeted for

each questionnaire in the larger set of measures. The Mini-K is a 20-item measure ranging from -3 (*strongly disagree*) to +3 (*strongly agree*) and includes questions like "I make plans in advance" and "I often get emotional support and practical help from my blood relatives." High scores reflect slow life history, and low scores reflect fast life history.

Second, based on prior research, we used one question to assess paternal contact or no contact during childhood by asking, "Did you have any contact with your father or primary male guardian while growing up?" Participants answered yes or no to this question. Fourteen of our 61 female participants reported never having contact with their father.

Results

Preliminary Analyses and Descriptive Statistics

Prior to conducting our hypothesis tests, we examined correlations between all study variables and computed means and standard deviations. As shown in Table 1, there was no significant correlation between scores on the Mini-K and ratings of soft traits or hard traits. There was also no association between father contact and ratings of soft and hard traits. These correlations indicated that those with a slower versus faster life history strategy did not differ in how they perceived the photos. That is, they did not see the photos as more or less masculine or feminine. In addition, we found no correlation between Mini-K and short-term attraction or long-term attraction. We also found no correlation between father contact and short-term and long-term attraction. These correlations indicated that those with a slower versus faster life history strategy did not differ in their overall levels of attraction toward the photos.

Data Analysis Plan

	Hard traits	ST attraction	LT attraction	Mini-K	Father contact	M	SD
Soft traits	-.04	.30*	.34**	.18	-.01	2.87	0.72
Hard traits	—	.18	.12	.15	-.08	2.98	0.76
ST attraction	—	—	.77***	-.04	-.04	1.93	1.05
LT attraction	—	—	—	.03	-.05	1.84	1.02
Mini-K	—	—	—	—	.09	0.80	0.74
Father contact	—	—	—	—	—	0.77	0.42

Note. Mini-K is scored such that higher scores represent a slower life history strategy. ST = short term, LT = long term. Father contact is dummy coded 0 = No contact with father, 1 = Contact with father. * $p < .05$. ** $p < .01$. *** $p < .001$.

To analyze the within-person (Level 1) associations between the perception of hard and soft traits and attraction as moderated by the between-subjects (Level 2) variables (life history strategy as indexed by Mini-K and father contact), we estimated a series of multilevel models using HLM 6.0 software (Raudenbush, Bryk, & Congdon, 2004). In the first set of models, we used scores on Mini-K as the Level 2 moderator variable. In the second set of models, we used father contact or absence as the Level 2 moderator.

Effect of Mini-K on Attraction

Hard traits and attraction. First, we examined the association between hard traits and short-term attraction. As shown in Table 2, there was a significant main effect of hard traits ($b = .15, p < .001$), indicating that participants were more attracted to individuals who they perceived as having more masculine traits (masculine, dominant, aggressive). There was no main effect of Mini-K, indicating that average levels of short-term attraction did not differ for those who scored lower or higher on the Mini-K. Finally, contrary to our prediction, there was no significant interaction between hard traits and scores on the Mini-K, indicating that scores on the Mini-K did not increase or decrease attraction to hard traits. This finding was not consistent with our hypothesis that lower scores on the Mini-K (a faster life history strategy) would predict higher levels of attraction to masculine male faces.

Next, we examined the association between hard traits and long-term attraction. As shown in Table 2, there was a significant main effect of hard

traits ($b = .05, p = .02$), indicating that participants were more attracted as potential long-term mates to individuals who they perceived to be more masculine. There was no main effect of Mini-K and no significant interaction between hard traits and the Mini-K. Once again, this finding was not consistent with our hypothesis. Scores on the Mini-K did not moderate the association between hard traits and level of attraction as long-term mates.

Soft traits and attraction. Next, we examined the association between soft traits and short-term attraction. As shown in Table 2, there was a significant main effect of soft traits ($b = .31, p < .001$), indicating that participants were more attracted to individuals they rated as higher in soft traits (trustworthy, caring, kind). There was again no main effect of Mini-K, but as predicted, there was a significant interaction between soft traits and the Mini-K ($b = .15, p < .001$). To understand this interaction, we computed the simple slopes relating soft traits to attraction at high (+1 SD) and low (-1 SD) levels of Mini-K. As shown in Figure 1, we found a strong and significant positive association between soft traits and short-term attraction for women with a slower life strategy ($\beta = .31, p < .001$), and a much weaker, but still significant, association for women with a faster life strategy ($\beta = .15, p < .001$).

Finally, we examined the association between soft traits and long-term attraction. As shown in Table 2, there was a significant main effect of soft traits ($b = .32, p < .001$), indicating that participants were more attracted to individuals they perceived as having soft traits. There was no main effect of Mini-K, but there was a significant interaction between soft traits and Mini-K ($b = .16, p < .001$). The pattern of the interaction as indicated by the simple slopes was very similar to the pattern shown in Figure 1. Although women, in general, preferred men who were higher versus lower in soft traits (trustworthy, caring, kind, supportive), this association was significantly stronger for women with a slower life-history strategy (those with higher scores on Mini-K).

Effect of Father Contact on Attraction

Hard traits and attraction. First, we examined the association between hard traits and short-term attraction. As shown in Table 3, there was a significant main effect of hard traits ($b = .15, p < .001$), indicating that participants were more attracted to individuals who they perceived as more masculine (masculine, dominant, aggressive). There was no main effect of father contact, but there was

TABLE 2

The Moderating Role of Mini-K on the Link Between Perception of Hard and Soft Traits and Short-Term and Long-Term Attraction

Predictor variable	Outcome Variable	
	Short-term attraction	Long-term attraction
Hard traits		
Hard traits	.15***	.05*
Mini-K	.05	.04
Hard traits x Mini-K	-.02	.01
Soft traits		
Soft traits	.31***	.32***
Mini-K	-.05	.04
Hard traits x Mini-K	.15***	.16***

Note. Mini-K is scored such that higher scores represent a slower life history strategy. * $p < .05$. ** $p < .01$. *** $p < .001$.

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a significant interaction between hard traits and father contact ($b = .15, p = .02$). To understand this interaction, we computed the standardized simple slope relating hard traits to short-term attraction for women whose fathers were present ($n = 47$) and absent ($n = 14$). We expected that women who had no contact with their fathers would be more influenced by facial masculinity, and our hypothesis was supported. As shown in Figure 2, there was a significant positive association between hard traits and short-term attraction for women whose fathers were not present ($\beta = .13, p < .001$), but no significant association for women who had contact with their fathers ($\beta = .02, p = .63$). In other words, women who reported no contact with their fathers (or those with a faster life history strategy) reported higher levels of short-term attraction to men who they rated as looking more versus less masculine, aggressive, and dominant, while women who had contact with their fathers showed no such preference for masculine faces.

Next, we examined the association between hard traits and long-term attraction. As shown in Table 3, there was a significant main effect of hard traits ($b = .05, p = .03$), indicating that participants were more attracted to long-term potential mates that they perceived to be more masculine (masculine, dominant, aggressive). There was no main effect of father contact and no interaction between hard traits and father contact.

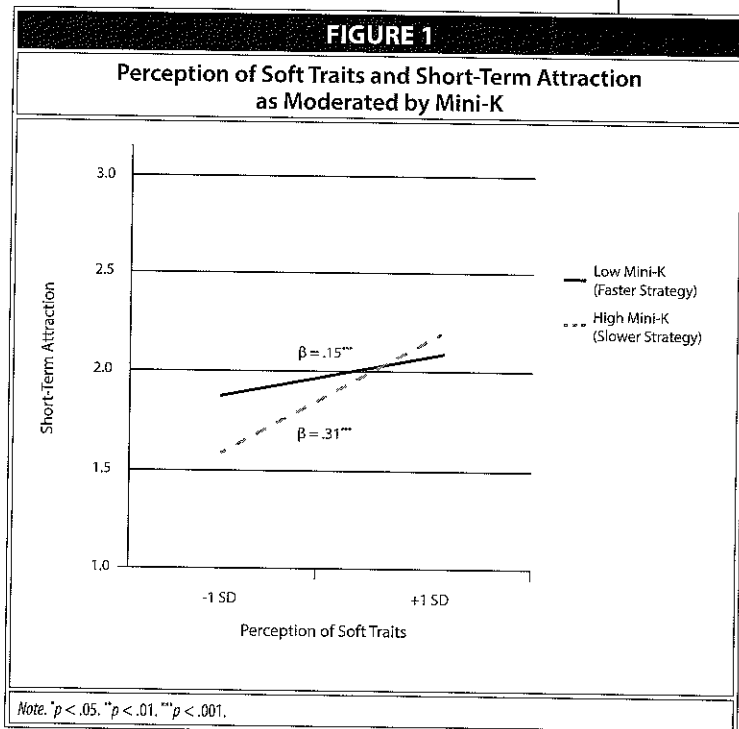
Soft traits and attraction. Next, we examined the association between soft traits and short-term attraction. As shown in Table 3, there was a significant main effect of soft traits ($b = .32, p < .001$), indicating that participants were more attracted to individuals who displayed softer traits (trustworthy, caring, kind, supportive). There was no main effect of father contact and, contrary to our prediction, no interaction between soft traits and father contact ($b = .06, p = .38$). We had predicted that women whose fathers were present would be more attracted to men with soft traits. We did not find this pattern for short-term attraction.

Finally, we examined the association between soft traits and long-term attraction. As shown in Table 3, there was a significant main effect of soft traits, indicating once again that participants were more attracted to individuals who displayed softer traits (trustworthy, caring, kind, supportive). There was no main effect of father contact, but there was a significant interaction between soft traits and father contact. To understand this interaction, we computed the standardized simple slope relating

soft traits to long-term attraction for women who had contact with their fathers ($n = 47$) and no contact at all ($n = 14$). As shown in Figure 3, there was a significant positive association between soft traits and long-term attraction for women who had no contact with their fathers ($\beta = .26, p < .001$), and a weaker (but still significant) association for women who had contact with their fathers ($\beta = .14, p < .001$). This pattern was inconsistent with our prediction.

Discussion

The objective of the present study was to investigate if women raised in stressful versus stable life environments, using different reproductive strategies, showed preferences for different kinds of male faces. Based on life history literature, cues from a woman's environment such as father absence or low scores on the Mini-K scale have been shown to gear women to employ a faster reproductive strategy (Figueredo, 2007). We anticipated that differences in life history strategy may not only direct women toward an early reproductive career, but also lead to complementary variation in mate preferences, such that women seek out partners consistent with their reproductive goals. We predicted that women on a faster life history track who had never had contact with their fathers and scored lower on the Mini-K life history measure would find masculine male faces more attractive, indicating a preference



for good health and immune function, especially for potential short-term mates. We also predicted that women on a slower life history track who had contact with their fathers in childhood and scored higher on the Mini-K life history measure would find softer male faces more attractive, indicating a preference for parental investment.

Results from our study were consistent with our hypotheses. In line with our first hypothesis, women employing a faster versus slower reproductive strategy with low scores on the Mini-K and father absence were more attracted to men who they perceived as more masculine, specifically when they were asked about short-term attraction. Women employing a slower life history strategy were not significantly more attracted to men with high versus low masculine traits. Consistent with our second hypothesis, women who should be employing a slower life history strategy with high scores on Mini-K and father contact were more attracted to men who had softer traits. This pattern emerged for both short-term and long-term mate attraction. Women employing a faster life history strategy were also more attracted to men with softer traits, but they were significantly less discriminating on this dimension. That is, softer traits were a stronger predictor of attraction for slow- versus fast-strategy women. In summary, our results revealed that women employing a slower life history strategy found softer (more feminine) traits as more attractive, whereas women with a faster life history strategy found men with harder traits (more masculine) as more attractive.

TABLE 3

The Moderating Role of Father Contact on the Link Between Perception of Hard and Soft Traits and Short-Term and Long-Term Attraction

Predictor variable	Outcome Variable	
	Short-term attraction	Long-term attraction
Hard traits		
Hard traits	.15***	.05*
Father contact	-.10	-.13
Hard traits x Father contact	.15*	.08
Soft traits		
Soft traits	.32***	.33***
Father contact	-.10	-.13
Hard traits x Father contact	.06	.17**

Note. Father contact is dummy coded 0 = No contact with father, 1 = Contact with father.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Women with a slower strategy reported more short-term and long-term attraction to men with more versus fewer soft traits who show more parental investment cues. These findings suggested that slow life history women were overall attracted to mates that demonstrated a potential for parental investment. Women with a faster life history strategy also reported short-term and long-term attraction to men high in soft traits, but this effect was not as strong. When asked to judge their short-term attraction to the male faces, however, women with a faster life history strategy were especially attracted to men who they ranked high on hard traits, suggesting that they were more attracted to masculine male faces that signal genetic quality and a strong immune system. How can we explain these findings?

Based on life history theory, we reasoned that different life history strategies would lead women to focus on different type of traits (parental investment vs. good genes) when selecting a mate. In line with this reasoning, we suggest that women employing a slower life history strategy show a preference for mates high in soft traits because these men can potentially provide them with the care, support, and paternal investment that they are looking for. It might have been more adaptive for these women who were born in stable life environments and could afford to grow and become more resourceful to not only reproduce later in life (Chisholm, 1999), but also to be careful in choosing a mate that may show early signs of paternal investment.

In contrast, women with a faster life history may be more willing to mate with someone who looks masculine and healthy because it was more adaptive for them to do so in the past. For these women who were raised in environments that were unstable, stressful, and potentially high in mortality, it would not only be advantageous for them to mate earlier in life as research has suggested (Chisholm, 1999), but also to choose a mate that can provide their progeny with great genes. Thus, from a life history perspective, it is possible that natural selection might have favored women in unstable environments to simply choose a mate who shows signs of strong genetic quality to increase the chances of them reproducing and their offspring surviving in environments where lifespans may have been short.

Limitations and Future Directions

One limitation of our methods was that, in the real world, women do not necessarily get to pick and choose what they want in a mate because their

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options are usually limited by the size of their mate pool. Instead, women make decisions based on what traits they find the most important in men who they believe to be necessary for their reproductive success (Li, Bailey, Kenrick, & Linsenmeier, 2002). To test this idea, we could have had our subjects participate in a forced choice task between the more masculine and more feminine male faces. To understand how differing reproductive strategy can affect mate preferences, it would have been beneficial to ask our participants to make forced choices between the two kinds of male faces by using questions such as "If you had to pick one of these men as a long-term romantic partner, which would you choose?" Following the example of Li et al. (2002), we also could have had participants prioritize certain traits over others to determine what features are most important in a mate given limited resources. Having our participants make these choices may provide clearer insight as to whether they prefer harder or softer traits in different situations.

Another limitation of our study was that we extracted our stimuli photographs from video data, which limited how uniform our faces looked. Instead of all of our photographs having one neutral pose, they varied in the expression of their faces and body positions. Our photographs were not specifically coded or manipulated to vary on degree of masculinity or femininity. Instead, we allowed participants to rate the perception of these traits. Often in the face perception literature, computer-morphing techniques are used to masculinize or feminize faces using various criteria (Cunningham et al., 1990). On the other hand, having real unmorphed images might be more naturalistic, capturing mate preferences as they might occur in everyday life. Therefore, this may be a strength rather than a limitation in our study. For future studies, it would be useful to obtain a set of photos that are standardized in terms of photo quality and photo features. It is possible that our participants might have responded differently if we had manipulated cues of masculinity, dominance, and aggression rather than gathering subjective ratings of those traits.

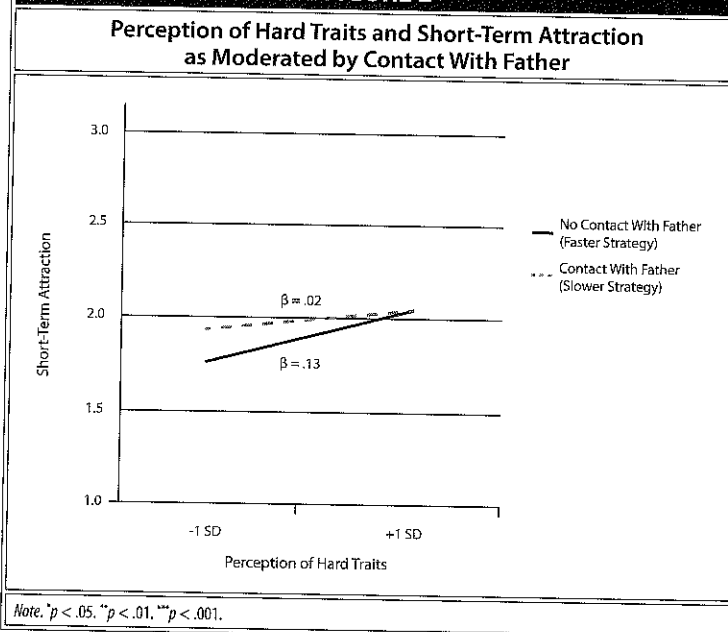
In future studies, it would also be useful to supplement self-report measures of attraction with physiological and behavioral measures of attraction. Although attraction is partially psychological, it is also a biological drive that can be measured using physiological measurements (Fisher, 2006). Scientists have demonstrated that self-ratings of

attraction are not always consistent with mate choices that people actually make in an ecologically valid context (Eastwick & Finkel, 2008). Evolution has shaped these psychological mechanisms in response to what was most adaptive in humanity's evolutionary past. However, so much is both unconsciously and consciously calculated by psychological mechanisms that these decisions could become very complex, and therefore not easily reported upon (Cosmides & Tooby, 1994). It would be helpful for future studies to assess attraction using physiological measures such as pupil dilation or behavioral measures such as length of time fixating on a picture in addition to a self-report questionnaire to measure attraction.

Scores on the Mini-K scale were also not especially varied. Although the theoretical range of the scale spanned from -3 to 3, our sample only ranged from -.7 to 2.45, showing a demonstrable skew to the positive side of the scale. Oversampling women who scored both very low and very high on the Mini-K would have given us a clearer picture of the data.

An additional shortcoming of our method was that we only asked one question inquiring about father contact. A new study has shown that the reason why the father is absent may also be an important factor in determining reproductive strategy (Shenk, Starkweather, Kress, & Alam, 2013). They found that women had earlier births and earlier age at first marriage if their father divorced

FIGURE 2



their mother or abandoned their family. However, they found for fathers who were migrant workers that paternal absence did not have an effect on age of first birth or marriage (Shenk et al., 2013). Therefore, asking more nuanced questions about the relationship that participants had with their fathers and why their fathers were absent would have given us more accurate information about their childhood stability.

Last, assessing life history theory using a biological cue such as time of menarche to outline reproductive strategy in addition to our self-report and demographic measures would have added to the reliability of our assessments. Previous research has shown that women who are born with absent fathers tend to experience menarche earlier as compared with girls who have fathers present during their childhood (Chisholm et al., 2005).

Future studies should focus on using biological correlates of life history theory (e.g., onset of menarche) and physiological measures of attraction. Also, the use of a forced choice task in a sample that includes both people who have a slow and fast reproductive strategy (people at both extremes) combined with more concrete measures of life history strategy and attraction might illuminate the processes that govern mate selection in women.

Implications

Using life history theory to study attraction can offer new insight into the world of decision making

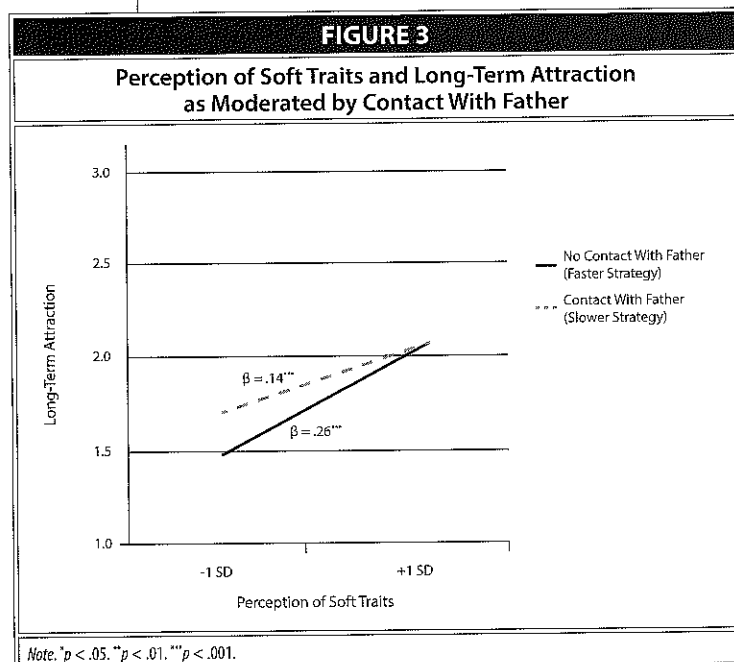
and mate choice. As research continuously demonstrates, these important decisions made by women every day are largely unconscious and might have been adaptive in the past, but they have serious implications for generations of women to come.

As our research demonstrated, if women on a faster life history track report lower levels of attraction to valuable diagnostic criteria in a male's face such as paternal investment cues, these women may be disadvantaged in being able to attain mates who can help raise their offspring. If these women with absent fathers are born to unsupportive environments and fail to select a mate that can offer them paternal investment, then this can lead to serious and adverse relationship outcomes. Being attracted to masculine men who may be unable to invest in children may lead to difficult lives for single mothers and unsupportive life environments. Single mothers have been shown to have a higher risk of being low-income, suffering from low self-esteem, and developing depression (Brown & Moran, 1997).

Moreover, the decisions that women make may not only affect them, but they could also have long-lasting effects for their children. For instance, high levels of perceived familial support have been linked to higher self-efficacy and positive health-related behaviors in children (Maldonado & Vaughn, 2013). Therefore, the lack of familial support, possibly due to an absent father, could have long-term affects on a child's psychological and physical health. Additionally, children who are raised in these conditions may also employ a faster life history strategy and favor unsupportive mates in their future, thus continuing the vicious cycle of absent fathers leading to unsupportive family environments, setting both women and their children on a faster life trajectory and subjecting them to adverse life consequences.

Conclusion

We discovered that there were specific differences in what kinds of mates women found attractive. We found that women employing a faster life history strategy (with father absence and lower scores on the Mini-K) reported lower levels of attraction to more feminine looking male faces and high levels of attraction to masculine looking faces. This might suggest that women on a faster life history track, raised in more stressful environments, developed a mate selection strategy that would have increased their reproductive success in the past, specifically by making them less selective when choosing a



mate. However, with increases in expected lifespan, technology, and medicine, this strategy may be maladaptive in environments where resources are ample and paternal investment is beneficial for healthy development.

Therefore, in many societies today, being unable to choose the right mate who is willing to invest time and energy in child rearing can become consequential for women and for their children's development. For these reasons, it is necessary to conduct more research on mate attraction and life history. Studying these mechanisms in ecologically valid contexts could further help women avoid the perpetuating cycle of single motherhood, low paternal investment, and adverse life outcomes.

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