

Original Article

**HUNGRY PEOPLE PREFER MORE MATURE MATES: A FIELD TEST OF
THE ENVIRONMENTAL SECURITY HYPOTHESIS**

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Abstract

The current studies tested the prediction that the visceral experience of hunger would lead men and women to show sex-specific preferences for mature partners because of the perceived value of mature characteristics under conditions of resource scarcity. Across two studies, unique samples of college students ($N=328$) were asked their preferences about ideal mates before or after eating dinner at a dining hall. Consistent with predictions, hungry males preferred females with more physically mature features, specifically females who were relatively heavier, taller, and older. Female participants who were hungry showed a marginally elevated preference for partners with a more mature personality profile. Hunger salience, manipulated by varying when hunger was assessed, had little effect on the overall pattern of results. Collectively, these studies indicate that visceral states can influence perceptions of environmental security, resulting in a preference shift for partners with characteristics that imply elevated maturity.

Keywords: Environmental Security, Evolutionary Psychology, Mate Preferences, Hunger, Attraction

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Hungry People Prefer More Mature Mates: A Field Test of the *Environmental Security Hypothesis*

An abundance of literature has documented several universal preferences when selecting a potential mate (see Ford & Beach, 1951). These preferences are quite consistent with evolutionary theory indicating that in order to maximize reproductive fitness, men prefer partner features that signal fertility, such as youth and beauty, while females prefer features that are signals of paternal investment (e.g., Buss, 1989; Trivers, 1972). But within these rather stable findings, subtle variations in mate preferences may arise, at least in part, from differential valuation of features in diverse ecological conditions.

Evolution and Current Environments: Differential Valuation of Thinness and Fatness

Recently, researchers have become interested in how certain environmental factors are capable of affecting the value people in various cultures place on certain mate preferences. An increasing number of researchers have explored how ecological variables influence the value that men place on the thinness or fatness of the female physique, mainly because of the underlying biological functions of female body fat. According to Anderson, Crawford, Nadeau, and Lindberg (1992), female body fat is of great evolutionary significance as it has historically served several fitness enhancing functions, including insulation, the storage of calories, and fertility regulation. However, their research indicates that preferential attitudes regarding female fatness are not static, but rather vary in a meaningful way with the reliability of the food supply within that culture. Specifically, men in cultures with scarce resources tend to prefer heavier women, whereas men in cultures with abundant resources prefer thinner women (Anderson et al., 1992).

In related research, Furnham and Baguma (1994) have shown that Ugandan participants assign higher attractiveness ratings to more obese male and female figures than do British participants. Similarly, Sobal and Stunkard (1989) found a direct relationship between socioeconomic status and female obesity rates in developing societies and an inverse relationship in developed nations. Collectively, these findings seem to suggest that resource availability may be a driving force in determining mate preferences (Tovée, Furnham, & Swami, 2007), such that a paucity of available resources leads men to shift their mate preferences to a partner whose physical characteristics imply elevated access to tangible resources.

In a recent extension of these findings, a creative series of studies has highlighted a more specific relationship between immediate resource scarcity, at the individual level, and female weight preferences. Specifically, Nelson and Morrison (2005) used financial satisfaction and hunger as variations of resource scarcity and found evidence that men who feel either poor or hungry prefer a potential female partner who is heavier compared to men who feel rich or satiated. Importantly, female hunger state and economic situation did not influence potential male partner weight preferences. Combining evolutionary and social cognitive theorizing, Nelson and Morrison suggest that affective and physiological states associated with resource availability at the individual level provide implicit information about collective resource availability, and that such information then influences the construction of personal preferences. Other research has corroborated these initial findings and has also found that hungry

individuals rate heavier females as more attractive than their thinner counterparts (Swami & Tovée, 2006).

Hunger → Heavier or More Mature?

The growing list of research indicating that the experience of hunger leads men to prefer heavier women is both robust and quite interesting. Extending beyond this relationship between the physiological state of hunger and a preference for heavier females, however, we conducted the current set of studies to explore whether there is actually a larger relationship between cues related to environmental threat, more broadly, and a preference for a variety of partner characteristics. According to the *Environmental Security Hypothesis* (*ESH*; Pettijohn & Tesser, 1999, 2005), individuals' interpersonal preferences may partially depend on how secure or insecure individuals feel regarding their surroundings at any given time. The *ESH* is a context-dependent theory of attraction and preferences drawing on evolutionary theory and ecology (Buss, 1994; Cunningham, 1986; McArthur & Barron, 1983). The *ESH* suggests that when individuals experience environmental threat, whether from social or economic conditions, they will prefer others with more mature characteristics compared to non-threatening conditions because maturity is associated with the ability to handle threat. Threatening conditions motivate individuals to select others whose mature characteristics convey a perceived ability to satisfy such needs. Several archival and experimental studies have found support for this theory using a variety of maturity-related measures (see Nelson, Pettijohn, & Galak, 2007, for a more comprehensive review).

The concept of maturity, when discussing preferences, is a broad construct that can refer to a variety of physical as well as behavioral characteristics of social targets. As this pertains to the current set of empirical predictions, the majority of the *ESH* research has documented the relationship between threatening conditions and an elevated male preference for females with more mature *physical* characteristics. For example, during historical periods of threat, actresses with mature facial features (Pettijohn & Tesser, 1999) and *Playboy* Playmates who were relatively older, heavier, taller, and who possessed larger waists and larger waist-to-hip ratios were preferred (Pettijohn & Jungeberg, 2004). These findings are quite consistent with previous evolutionary findings that male mate preferences are related to physical features that signal fertility (Buss, 1994; 1989; Singh, 1993; Symons, 1979).¹ The *ESH* adjusts evolutionary predictions by considering current social and environmental influences. Although males of reproductive age have an evolved preference for youthful females, it is predicted that elevated environmental uncertainty (e.g., hunger) will lead to a preference for a female partner who is slightly older and taller than their ordinary preferences due to a temporarily elevated preference for physically more mature female partners. Previous research reveals that taller individuals are perceived to be stronger, more independent, and more dominant than shorter individuals (Adams, 1980; Boyson, Pryor, & Butler, 1999; Melamed, 1992; Young & French, 1998). Thus, males experiencing environmental threat should be more willing to show a small, but significant, amount of flexibility with respect to partner fertility in order for a slight gain in partner maturity because of the perceived benefits of mature partner characteristics under environmental threat (e.g., physical maturity signals elevated access to tangible resources).

Due to the differential adaptive problems that reproduction has posed for women, such as greater parental investment in offspring (e.g., gestation, child-bearing,

lactation), women's preferences for potential mates do not revolve as much around the physical characteristics of potential mates, but rather on perceptions of their willingness to commit and invest in offspring (Parental Investment Theory; Trivers, 1972). As such, females tend to prefer a partner who is wealthy (Hudson & Henze, 1969), socially dominant (Sadalla, Kenrick, & Vershure, 1987), high in social status (Townsend & Levy, 1990), as well as dependable, stable, and intelligent (Okami & Shackelford, 2001). Thus, we predicted that any preference shifts in an ideal partner for females should be found with respect to preferences for personality profiles that are indicative of maturity, rather than systematic preference shifts for physical characteristics in males, because these mature personality characteristics would be more indicative of potential parental investment than would physical characteristics.

The Current Research

Applying the *Environmental Security Hypothesis* to resource scarcity stemming from visceral states, the current studies posit that hunger, like other forms of resource scarcity, is simply one of any number of threat related cues meant to prepare the organism for the most adaptive course of action, including adaptive changes in partner preferences. Just as more general cognitive manipulations of uncertainty and threat lead individuals to behave in a manner meant to ensure self-protection, such as through displays of elevated ingroup regard (Grieve & Hogg, 1999), immediate visceral factors, like hunger, should have a similar preparatory effect (Loewenstein, 1996). Hunger signals the need for nutritional input, which is a signal of resource scarcity, and should lead the individual to engage in behaviors and show preferences in line with that state of scarcity, or threat.

In the context of the *ESH*, these preferences will be reflected primarily by hungry men displaying an elevated desire for females who possess characteristics of physical maturity. Specifically, hungry men are not just expected to prefer a relatively heavier female partner, but also a female partner that is relatively taller and older. Weight, height, and age are physically mature characteristics that imply elevated access to resources. Unlike past research, however, we considered the Parental Investment Model (Trivers, 1972) to make tentative predictions about changes in female preferences under conditions of resource scarcity. We anticipated that female preference shifts with respect to physical characteristics would not be as strong as they would be for male participants, because of the overall reduced value women place on such characteristics (Buss, 1994; Pettijohn & Tesser, 2003; Sobal & Stunkard, 1989; Trivers, 1972). Thus, female results concerning weight and height were expected to be attenuated. However, hungry women were expected to show an elevated preference for males who possess more mature personality characteristics, because of the overall increased value women place on such characteristics in the context of obtaining mates with a high willingness to invest in offspring (Buss, 1994; Trivers, 1972).

Two studies were designed to test these predictions. Study 1 inquired about participant hunger state after the ideal mate preferences were recorded, consistent with Nelson and Morrison's (2005) methodology. Study 2 reversed the order such that hunger state was asked prior to inquiries regarding ideal mate preferences. Specifically, we wanted to see what effect explicit awareness of a need state would have on preferences for ideal partners. Similar to much of the research on goal activation effects (e.g., Chartrand & Bargh, 1996; Stapel & Koomen, 2005), we expected little difference in

partner preference shifts regardless of whether participants were not actively thinking about their hunger state (Study 1), or were made explicitly aware of their current state of hunger (Study 2).

STUDY 1

Method

Participants

A convenience sample of 162 undergraduate students (80 men, 82 women) were randomly approached and asked to complete a brief, informal interview with a researcher either before or after eating dinner at a college dining hall. Three additional students chose not to participate.

Materials & Procedure

Weight Preference Assessment. We obtained the national weight average for eighteen year-old males ($M=160.6$ lbs) and females ($M=138.9$ lbs) in America (National Health and Nutrition Examination Survey III, n.d.) and created six weight categories in 10 lb increments around these averages. The female weight categories were <119 lbs, 120-129 lbs, 130-139 lbs, 140-149 lbs, 150-159 lbs, and >160 lbs. The male weight categories were <139 lbs, 140-149 lbs, 150-159 lbs, 160-169 lbs, 170-179 lbs, and >180 lbs. Using these categories, participants were then asked “What is the weight of your ideal romantic partner?”

Height and Age Preference Assessments. Participants were asked “What is the height (feet and inches) of your ideal romantic partner?” and “How much older or younger (in years) is your ideal romantic partner?”

Personality Preference Assessment. Participants were shown two sets of personality clusters and asked “which of the following two personality descriptions is most attractive to you?” The mature personality cluster consisted of the traits “strong, mature, independent, competent” and the non-mature personality cluster consisted of the traits “warm, naïve, kind, agreeable.” These traits were chosen based on past research (Berry & McArthur, 1985; Keating, Mazur, & Segall, 1981; Pettijohn & Tesser, 2005) differentiating mature from non-mature attributions. Traits such as warmth and kindness may reveal an increased willingness to nurture offspring (MacDonald, 1992) whereas traits such as competence may communicate an increased willingness to protect offspring (Geary, 2007). Although both sets of traits are indicative of some type of investment in potential offspring, the mature constellation is consistent with impressions of status and wealth and the elevated ability to invest physical resources, compared to the non-mature constellation of personality characteristics.

Hunger Assessment. Participants were asked “On a scale from 0-10, 0 being not at all hungry and 10 being very hungry, how hungry are you at this moment?” to measure hunger state.

Procedure. The interviewer waited outside the entrance/exit of the dining hall and asked students to complete a brief questionnaire on “perceptions of ideal romantic partners.” A male researcher interviewed the male participants and a female researcher interviewed the female participants. Interviewers were blind to the study hypotheses. All questions were asked verbally and the interviewer wrote down the responses. All materials and questions were presented in random order, except the hunger question, which was always posed last. The interviews took place on several days over the course

of two weeks between the hours of 5 and 7 p.m. Participants were asked to verify they had not previously participated before interview questions were presented to guarantee the same respondents did not participate more than once.

Results and Discussion

Comparing the hunger responses between before and after dinner interviews revealed that the groups were significantly different in terms of their hunger states for both males, $t_{78}=13.8$, $p<.001$, $d=3.13$ ($M_s=6.78$ and 1.0 , respectively), and females, $t_{80}=18.7$, $p<.001$, $d=4.18$ ($M_s=6.44$ and $.37$, respectively).

Although six weight preference categories were used as response options, a portion of the categories were infrequently selected. Based on a median split, we combined categories for analysis. As predicted, there was a relationship between hunger state and ideal partner weight preference such that hungry male participants preferred ideal mates from the heavier category (>130 lbs) and satiated males preferred ideal partners from the lighter category (<130 lbs), $\chi^2_{1}=4.01$, $N=80$, $p=.04$, $\phi=.22$. We found no relationship between hunger state and female ideal partner weight preference (<180 lbs or >180 lbs), $\chi^2_{1}=.05$, $N=82$, $p=.83$.

Consistent with our predictions, a t-test revealed a non-significant trend such that males preferred ideal partners who were taller before eating dinner ($M=67.18$ inches, $SD=2.30$) compared to after eating dinner ($M=66.38$ inches, $SD=2.06$), $t_{78}=1.64$, $p=.10$, $d=.37$. Female ideal mate height preferences were approximately the same in the before dinner ($M=71.48$ inches, $SD=2.34$) and after dinner ($M=71.07$ inches, $SD=2.64$) conditions, $t_{80}=.75$, $p=.53$. Although not reaching conventional levels of significance, these results are consistent with our predictions. In retrospect, we postulated that measuring relative height preference, as opposed to absolute height preferences, would have provided a more sensitive height preference method (Sheppard & Strathman, 1989). This was a methodological detail that we addressed in Study 2.

As predicted, a t-test revealed a non-significant trend such that hungry male participants preferred ideal mates who were slightly older ($M=.45$, $SD=1.72$ years) than themselves while satiated males preferred ideal mates who were slightly younger ($M=-.34$, $SD=2.02$ years) than themselves, $t_{78}=1.88$, $p=.06$, $d=.43$. Female participants preferred ideal mates who were older than themselves in both the hungry ($M=1.98$, $SD=1.37$ years) and full ($M=2.23$, $SD=1.04$ years) conditions and these differences were not significant, $t_{80}=.96$, $p=.34$. Interestingly, although previous research exploring human mate preferences often indicates that females prefer older males and males prefer younger females (e.g., Bolig, Stein, & McKenry, 1984; Harrison & Saedd, 1977), our current results indicate that males actually prefer females who are slightly older than themselves when experiencing a resource threat (i.e., hunger). However, the hungry male preference for older females is consistent with other research indicating that young males often show variability in their age preference for potential mates (Kenrick, Keefe, Bryan, Barr, & Brown, 1995). Such variability in partner age preference, as previously reported and as found in the current research, may be partially explained by temporary psychological and physiological states, such as hunger. Indeed, hunger ratings were positively correlated with relative ideal mate age preference for male participants, $r_{78}=.25$, $p=.02$, and hunger ratings were negatively correlated with relative ideal mate age preference for female participants, $r_{80}=-.23$, $p=.04$.

The relationship between hunger condition and personality cluster preference for

the male participants was not significant, $\chi^2_1=2.49$, $N=80$, $p=.11$. However, we found a non-significant trend for the female participants, $\chi^2_1=3.47$, $N=82$, $p=.06$, $\phi=.21$ (see Figure 1). The hungry females showed a statistically significant preference for the mature personality traits (75.6%) over the non-mature personality traits (24.4%), $\chi^2_1=10.8$, $N=41$, $p<.001$, $\phi=.51$. Consistent with predictions, it seems that personality factors are a more important criterion in judging ideal mates for females rather than males.

STUDY 2

Study 2 was a conceptual replication of Study 1, with slight alterations as well as one substantial methodological variation. The hunger question was moved from last in the series of interview questions to first. We wanted to ensure that we could replicate the hunger-maturity relationship when participants were made directly aware of their current state of resource scarcity. Although we considered these preferences might be strengthened when hunger was salient, we predicted any differences would be relatively small. The questions concerning weight and height were also modified, to provide more finite weight categories for selection and to determine relative height preferences instead of absolute preferences.

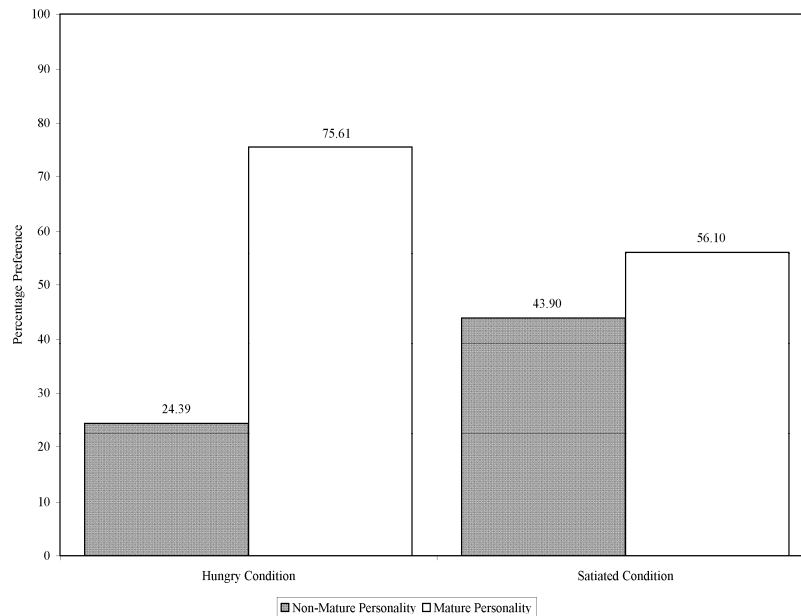


Figure 1. Female personality preference of ideal male partner by hunger condition, Study 1.

Method

Participants

A convenience sample of 166 undergraduate students (80 men, 86 women) were randomly approached and asked to complete a brief, informal interview with a researcher either before or after eating dinner at a college dining hall. Two additional students chose not to participate.

Materials & Procedure

The same materials and procedure used in Study 1 were also used in Study 2, with a few slight changes. We adjusted the height question from an absolute preference to a relative preference by asking participants “how much taller or shorter (in inches) is your ideal romantic partner?” Also, based on unequal responses to the weight preference categories in Study 1, we reconfigured the six categories to provide more weight preference options. The revised female weight preference categories were <114 lbs, 115-119 lbs, 120-124 lbs, 125-129 lbs, 130-134 lbs, and >135 lbs. The revised male weight preference categories were <164 lbs, 165-169 lbs, 170-174 lbs, 175-179 lbs, 180-184 lbs, and >185 lbs. The age and personality preference questions remained the same. We also asked the participants’ personal height and age so we could demonstrate the hungry/satiated groups were similar on these variables.

Results and Discussion

Comparing the hunger responses between before and after dinner interviews revealed that the groups were significantly different in terms of their hunger states for both males, $t_{78}=16.3$, $p<.001$, $d=3.69$ ($M_s=7.32$ and 1.15 , $SD_s=1.90$ and 1.46 , respectively), and females, $t_{84}=12.6$, $p<.001$, $d=2.75$ ($M_s=6.44$ and 1.40 , $SD_s=1.72$ and 1.99 , respectively). Participants in the hungry and satiated conditions were of similar age for males ($M_s=19.3$ and 19.1 years, $SD_s=1.51$ and 1.52 , respectively) and for females ($M_s=19.6$ and 19.6 years, $SD_s=1.52$ and 1.55 , respectively). Male participants in the hungry and satiated conditions were also similar heights ($M_s=71.6$ and 71.7 inches, $SD_s=3.62$ and 2.92 , respectively), as were the female participants ($M_s=64.8$ and 64.6 inches, $SD_s=2.82$ and 2.82 , respectively).

Again, based on a median split, we combined the six weight preference categories into two for analysis. As predicted, hungry male participants preferred ideal romantic partners who were relatively heavier (>120 lbs) and satiated males preferred ideal partners who were relatively lighter (<120 lbs), $\chi^2_1=8.58$, $N=80$, $p<.01$, $\phi=.33$. Female hunger state and ideal partner weight preference (<175 lbs versus >175 lbs) were not significantly related, $\chi^2_1=1.72$, $N=86$, $p=.19$. These results were similar to our results in Study 1, although male weight preferences were strengthened with hunger salience.

Males preferred ideal partners who were shorter than themselves when both hungry ($M=-3.38$ inches, $SD=2.27$) and satiated ($M=-4.50$ inches, $SD=2.75$), and as predicted, the difference in magnitude between these relative preferences was statistically significant, $t_{78}=2.0$, $p=.05$, $d=.45$ (see Figure 2). Female ideal mate height preferences were approximately the same in the hungry ($M=5.77$ inches, $SD=2.72$) and satiated ($M=5.47$ inches, $SD=2.77$) conditions, $t_{84}=.51$, $p=.61$. These height preference results in Study 2 are more precise than Study 1 since we asked about relative height

preferences instead of absolute preferences. These overall results were very similar to the results in Study 1, and we demonstrated the groups were comprised of similarly aged individuals.

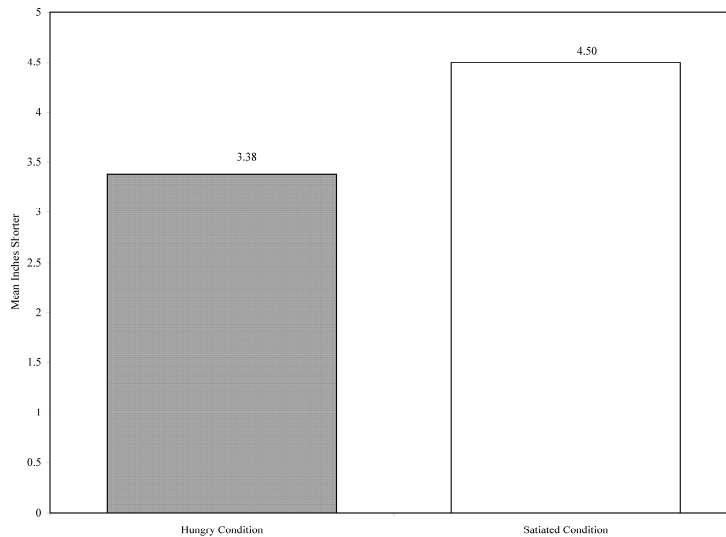


Figure 2. Mean relative male height preference of ideal female partner by hunger condition, Study 2.

As predicted, hungry male participants preferred ideal partners who were slightly older ($M=1.08$, $SD=2.27$ years) than themselves and full males preferred ideal partners who were slightly younger ($M=-.58$, $SD=1.38$ years) than themselves, and this difference in preferences between hunger states was statistically significant, $t_{78}=3.93$, $p<.001$, $d=.89$. Female participants preferred ideal partners who were older than themselves in both the hungry ($M=1.58$, $SD=1.14$ years) and full ($M=1.56$, $SD=1.44$ years) conditions, and this difference was not significant, $t_{84}=.08$, $p=.93$. Hunger ratings were positively correlated with relative ideal mate age preference for male participants, $r_{78}=.37$, $p<.001$, although hunger ratings were not correlated with relative ideal mate age preference for female participants, $r_{84}=.06$, $p=.56$. Compared to Study 1, the current relative male age preferences were similar but stronger (see Figure 3), with a larger effect size. Priming hunger appears to have strengthened age preferences for ideal mates in males.

As in Study 1, we did not find a significant relationship between hunger condition and personality cluster preference for the male participants, $\chi^2_1=1.84$, $N=80$, $p=.18$. Although we failed to find the relationship for hunger condition and personality cluster preference in the female sample that we found in Study 1, $\chi^2_1=.93$, $N=86$, $p=.34$, we did find a preference for mature traits (76.7%) over non-mature traits (24.3%) in the hungry condition, $\chi^2_1=12.3$, $N=43$, $p<.001$, $\phi=.53$. The hungry females' greater preference for mature traits was similar to the results in Study 1, although the effect size was slightly larger in Study 2. Although somewhat more tenuous than the results of Study 1, hungry females' preference for mature personality traits across both studies

supports our prediction that personality is more central to females' criteria for an ideal mate compared to males (Buss, 1994).

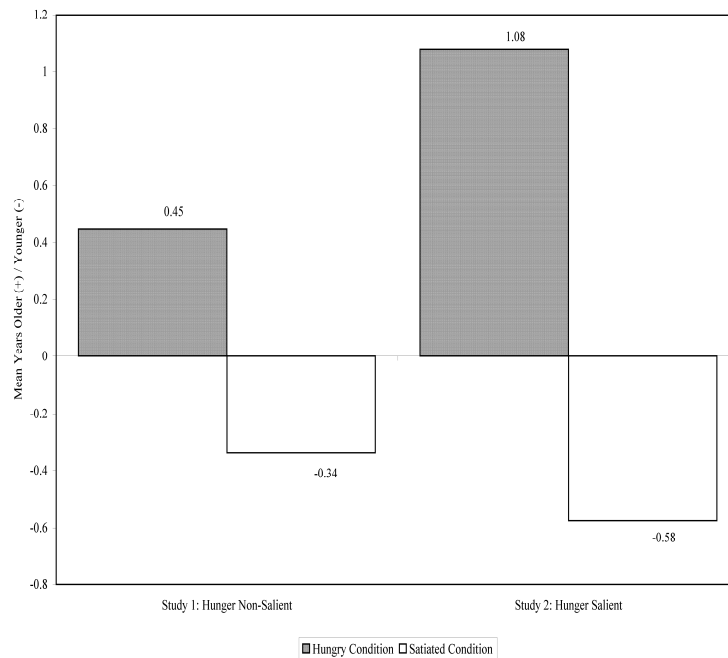


Figure 3. Mean relative male age preference of ideal female partner by hunger condition, Study 1 and Study 2.

As in Study 1, we did not find a significant relationship between hunger condition and personality cluster preference for the male participants, $\chi^2_1=1.84$, $N=80$, $p=.18$. Although we failed to find the relationship for hunger condition and personality cluster preference in the female sample that we found in Study 1, $\chi^2_1=.93$, $N=86$, $p=.34$, we did find a preference for mature traits (76.7%) over non-mature traits (24.3%) in the hungry condition, $\chi^2_1=12.3$, $N=43$, $p<.001$, $\phi=.53$. The hungry females' greater preference for mature traits was similar to the results in Study 1, although the effect size was slightly larger in Study 2. Although somewhat more tenuous than the results of Study 1, hungry females' preference for mature personality traits across both studies supports our prediction that personality is more central to females' criteria for an ideal mate compared to males (Buss, 1994).

General Discussion

Consistent with our *Environmental Security Hypothesis* predictions, these two studies offer evidence that the physiological experience of hunger, similar to the experience of other forms of threat, influences ideal partner preferences. Specifically, hungry males preferred females who were relatively older, taller, and heavier. Hunger salience strengthened differences between hungry and full male age preferences, but consistent with our predictions, hunger salience had little effect on polarizing other ideal partner preferences. Overall, female preferences for the physical characteristics of age, height, and weight were attenuated and not significantly altered by hunger state. However, hungry females preferred males with mature personality characteristics over non-mature characteristics. This is consistent with the theorizing that women place greater value on characteristics indicative of parental investment, such as personality traits, causing them to be especially sensitive to environmental cues, like hunger, that may require them to be more discerning in these preference areas (Buss, 1994; Trivers, 1972).

These results not only support previous research showing a relationship between male hunger and a preference for heavier females (Nelson & Morrison, 2005), and extend such results to a broader relationship between cues related to resource scarcity and preference shifts towards others who are physically and psychologically more mature. Specifically, the current research replicated the male preference for heavier female partners when experiencing resource scarcity, but extended both male and female partner preferences into the areas of age, height, and personality. Furthermore, we contend that the current results can be explained under the broad umbrella of the *Environmental Security Hypothesis*. Although this theory has argued that threat originating from societal threat or economic resource scarcity leads to an elevated preference for more mature others, the current study shows that the experience of immediate resource scarcity, specifically hunger, leads to many of the same systematic preference shifts for maturity found in past investigations.

Although provocative, the results of these studies do have some caveats. We conducted field studies, and thus we did not directly manipulate the physiological threat of hunger. A true experimental manipulation of hunger would reduce the ambiguity of the difference between hungry and satiated participants. Another variation of this research could be completed by asking the same males and females their mate preferences before and after eating. It is also important to note that the current sample of college students was not comprised of individuals with an extreme physiological need of food, and their hunger threat was relatively short term since they were anticipating access to food immediately before being surveyed. College students may not always eat nutritiously, but there is abundant food available on and around the college campus.

Future investigations could utilize samples with more uncertain food sources that experience more long term hunger threat, in other cultures or within the U.S., and with different age groups. We would expect similar patterns of preferences for mature partners in hungry individuals and preferences for less mature partners in satiated individuals across cultures, but we can also envision variation in the magnitude of these effects. Just as males and females show differential emphasis of mate selection criteria as explained by evolutionary theory (Buss, 1989), these patterns vary from location to location depending on social roles and social structure (Wood & Eagly, 2002). Although

we suggest that the shifts in mating preferences documented in our studies represent an evolved adaptive response, part of the adaptive nature of these response patterns are their sensitivity to variations in local ecologies that reflect different strategies for navigating one's environment (Gangestad & Simpson, 2000). As another example of environmentally-contingent adaptive responding, there is much evidence that humans evolved a behavioral immune system to detect potential cues of disease in others (e.g., sores, compromised gait) in order to avoid contracting such pathogens (Schaller & Duncan, 2007). One such cue, facial asymmetry, which is a sign of high mutagen load, is considered unpleasant cross culturally; yet this preference for symmetry is greater in cultures where the threat of disease is greater and the importance of detecting signs of health are then more important (Little, Apicella, & Marlowe, 2007).

While decisions about characteristics of an ideal mate were made in response to a short term hunger threat in the current study, ideal partner preferences may have short term and long term adaptive consequences. Although potentially puzzling, a great deal of literature indicates that individuals use feeling states as information about the environment (Schwarz, 1990). As argued by Nelson and Morrison (2005), individuals may use their immediate affective and physiological states stemming from hunger to implicitly infer the state of resource availability at the level of culture. Thus, a temporarily hungry person may assume that his general environment is resource scarce, leading him to make decisions to maximize survival and reproduction in a potentially indefinitely resource depleted ecology. That is, temporary hunger may implicitly be interpreted as evidence of an environment lacking in resources, which leads individuals to show adaptive preference shifts for long term survival in that environment (i.e., physically and psychologically mature characteristics).

It is also important to mention that hungry males did not indicate a preference for females with extremes in age, height, or weight differences. Instead, male preference differences were relatively small (~1 year in age, ~1 inch in height), but these differences were statistically significant and consistent across studies. While we obtained differences relying on self-reported preferences of weight and height, using visual preference stimuli, such as drawings or photographs of models, may increase ecological validity (Fallon & Rozin, 1985; Fink, Neave, Brewer, & Pawlowski, 2007). Finally, future investigations may consider how preferences for hair color, skin color, and other mate selection factors are influenced by resource scarcity.

Although we argue in the current studies that females experiencing elevated threat should show adaptive changes in their preferences for personality characteristics in potential mates while males' preference shifts should take place in the context of physical characteristics, this is not meant to imply that female and male preferences in these other domains are invariable. Specifically, there is much evidence indicating that females discriminate between men on the basis of certain physical cues related to inclusive fitness, such as facial masculinity (Johnson, Hagel, Franklin, Fink, & Grammer, 2001), body scents associated with symmetry (Gangestad & Thornhill, 1998), and the musculature of the body (Frederick & Haselton, 2007). There is also evidence that men prefer certain personality characteristics depending on relationship type, including a preference for passionate and sexually desirable females as short term mates and a more socially appealing partner as a long term mate (Regan, Levin, Sprecher, Christopher, & Cate, 2000). However, we make the argument that due to the different adaptive problems of reproduction that have evolved for males and females, men and

women are likely to show stronger preference shifts in those domains that are consistent with solutions to adaptive problems they have historically faced (Cosmides & Tooby, 1992). Thus, temporary threat should lead men to show partner preference shifts in domains related to physical characteristics and women in domains related to parental investment potential.

Does appetite for food result in an increased desire for more of everything, not just mate characteristics? Although not experimentally ruled out in the current study, other research (Swami, Poulgianni, & Furnham, 2006) has shown that hunger influences human body weight preferences, but does not influence preferences for larger sizes of anvils and bottles or bottles with more content. Future studies will have to tease apart the types of preferences which are influenced by hunger and those which are not to test the domain-specificity versus domain-generality of the current findings. Another question to consider is whether there is something special about the physiological threat of food scarcity which produces the ideal mate preference shifts reflected in the current studies, or whether threat, more broadly construed, influences ideal partner preferences similarly? Comparing the results of the current study with past investigations of the *ESH*, it seems that threat related cues, whether psychological, environmental, or visceral, seem to lead individuals to prefer maturity in others. Additionally, neuroimaging research indicates that threat cues from both social and physical experiences result in similar patterns of brain activation (Eisenberger & Lieberman, 2004). Future research may further explore the types of threat, specific or general, which activate preferences for maturity.

One interesting investigation into the possibility of generalized threat effects on mate preferences could explore how the experience of ostracism influences individuals' preferences for maturity in potential mates. Recent research indicates that one way in which individuals prioritize goals related to reproduction and survival is based on cues related to current levels of social belonging; that is, individuals made to feel socially included show increased mating interest compared to individuals made to feel socially excluded or control condition participants (Brown, Young, Sacco, Bernstein, & Claypool, 2009). Because belonging to social groups satisfies needs such as access to food and protection, included individuals can reprioritize effort into mating. However, because the interest in mating between control participants and excluded participants does not differ, it may be that exclusion (or a lack of access to basic resources necessary for survival) does not suppress mating interest, but rather refocuses it towards others with characteristics implying an enhanced ability to obtain resources, such as characteristics related to maturity. Consistent with hungry participants in the current study preferring mature partners, we would then hypothesize that socially excluded persons, because they may be lacking in resources similar to hungry individuals, would also show a preference for mates with more mature features. Consistency across a variety of threat domains ranging from visceral states, such as hunger, and social situations, such as ostracism, would provide a great deal of support for a more general mechanism whereby threat cues lead to a broad preference for mature others.

In sum, the current findings extend the *Environmental Security Hypothesis* and contribute new insights into how immediate environmental circumstances related to resource scarcity are capable of influencing basic human mate preferences. Successfully identifying and acquiring mates requires a careful assessment of the potential value of partners. As such, selection pressures have led to the development of sensitivities to

cues that may be indicative of high mate value. Since environmental threat is a constantly changing evaluation, mate preferences may also change based on their ecological assessments. Hungry men prefer female partners who are *physically* more mature and hungry women prefer male partners with more mature *personality* profiles, even when hunger state is not directly salient. Knowledge of these fluctuations may provide insight into interpersonal attraction variations and help people understand their penchant for certain mate qualities.

Note

¹ Some research indicates that such mate preferences are not as universal as previously suggested (e.g., Tassinary & Hansen 1998) and that environmental context is important in specifying a more context-sensitive, flexible set of mate preferences (Sugiyama, 2004, 2005). However, arguments that mate preferences are environmentally contingent are consistent with the hypotheses of the current research.

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