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Intrasexual Competition Among Women: The Influence of Same-sex Rivals on Women's Purchasing and Risk-taking Behavior Across the Ovulatory Cycle

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by

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Dedication

This dissertation is dedicated to my mother, Donna Durante Finch, who believed in and supported me through every endeavor. And, to my husband, James F. Winschel III, whose unwavering support made this current endeavor possible.

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**Intrasexual Competition Among Women: The Influence of Same-sex Rivals on Women's
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The following will explore the operation of evolved mechanisms connected with cycling fertility. I first address strategic shifts in women's behavior near ovulation and hypothesize that certain behavioral shifts at high fertility reflect an increase in women's intrasexual competition tactics when conception is most probable. A simulated, online shopping program was designed to track women's spending patterns (at varying budgets) on clothing, undergarments, shoes, jewelry, and other fashion accessories – items that likely enhance a woman's ability to attract a high quality mate and effectively compete with same-sex rivals. Additionally, a laboratory task was created to assess women's likelihood of incurring a risk to appear more attractive and have access to more resources than same-sex peers. Studies 1-3 will explore the effect of fertility on women's consumer behavior and the influence of same-sex peers on fertility-induced motivation to appear more attractive. Study 4 will further examine fertility-induced shifts in women's intrasexual competitiveness by measuring context-specific risks women take to gain a positional advantage over same-sex peers. The current studies present new data that provide novel insights into human adaptations to cycling fertility and highlight important decision-making processes that guide women's social competition within a variety of domains.

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Chapter 1 – The Ovulatory Shift in Purchasing Behavior

I dress for the image. Not for myself, not for the public, not for fashion, not for men.

- Marlene Dietrich

I dress for women and I undress for men.

- Angie Dickenson

In 2005, why did women spend 171.3 billion dollars – 50% more than the U.S. federal government spent on education – on fashion apparel (Women’s Wear Daily, 2005)? Why do young men use credit cards to purchase electronics, entertainment, and food, but women use credit cards primarily to obtain new clothing (Turner, 2000)? According to a fashion industry observer, for young women, it is “all about dating, mating, and being attractive.” (Women’s Wear Daily, 2005). That is, women’s purchases of clothing seem to be motivated and guided by desires to enhance their appearance to potential mates. On the surface, this appears to be a reasonable explanation. However, by digging deeper, we contend that women’s consumer behavior may be more directly motivated by intrasexual competition (outdoing other women) than by the allure of potential mates. To investigate this overlooked but important distinction (Durante, Li, & Haselton, 2008), we examined what motivates women’s attractiveness-related consumer behavior. In particular, we examined intra-individual shifts in women’s consumer purchasing across the monthly ovulatory cycle. We were interested in whether fertility status influences women’s consumption of sexy and revealing fashion and accessories items and whether this shift is driven by mating-related motivations (i.e., the presence of attractive men) or by intrasexual competitive motivations (i.e., the presence of attractive women).

Do Women Enhance Their Attractiveness for Men or for Other Women?

Whereas a man's mate value is strongly influenced by his ability to generate and provide resources, a woman's mate value depends more on her current fertility (Symons, 1979). Because ancestral women likely varied in their ability to produce offspring, men may have evolved attraction toward visible cues related to age and health (Symons, 1979; Williams, 1975).

Consistent with this, extensive mate preference research has shown that men consider a woman's physical attractiveness to be especially important in long-term and short-term romantic partner (e.g., Buss, 1989; Fletcher, Tither, O'Loughlin, Friesen, & Overall, 2004; Li, Bailey, Kenrick, & Linsenmeier, 2002; Li & Kenrick, 2006). More specifically, women with soft facial features, facial symmetry, large breasts, and a low waist to hip ratio – features reliably correlated with fertility – are highly desired by men (Jasienska et al., 2004/2006; Singh, 1993; Singh & Randall, 2007; Symons, 1979).

Unlike men, whose competitive tactics are overt and often involve displays of aggression to indicate social dominance (e.g., Van Vugt, DeCremer, & Janssen, 2007), women compete with one another largely on appearance (Campbell, 2004) by using make-up, tanning services and products, anti-wrinkle creams, push-up bras, and tight clothing (Saad & Peng, 2006; Saad, 2007; Tooke & Camire, 1991). As women age, they use larger quantities of make-up and other beauty products (e.g., hair coloring) to correct asymmetries and to signal youth, and many resort to surgical procedures (Etcoff, 1999). Indeed, according to the American Society of Plastic Surgeons (Report of Procedural Statistics, 2008), 90% of the 11.7 million cosmetic surgical and non-surgical procedures occurring in the United States in 2007 were performed on women.

Although such behaviors suggest that women are going to great lengths to appear more physically attractive to men, women may actually be more directly concerned with besting other women. That is, because women's mate value depends largely on their underlying fertility, and fertility is implicitly gauged by a woman's physical appearance, attempts to enhance appearance are ultimately tied to enhancing perceived reproductive value to potential mates. However, at a more immediate level, women may be motivated by intrasexual competition rather than by mating.

This distinction may, at first glance, seem very subtle. However, it is an important distinction and one that is apparent in other lines of research, including consumer behavior. Dating back to Thorstein Veblen's *Theory of the Leisure Class* (1899, 1994), research in consumer decision-making has sought to understand why people's preferences are often influenced by the preferences and spending patterns of others. Veblen coined the term *conspicuous consumption* to define the human tendency to spend money on unnecessary luxury goods to signal that one has enough money such that they can afford to engage in wasteful spending. Instead of seeking to maximize personal consumption utility, many individuals make consumer decisions based on the preferences and resource holdings of their peers (Frank, 1999). In particular, people tend to value having a higher amount of reproductively relevant qualities (e.g., money, attractiveness) than their peers – even if it means having less in terms of absolute quantity (Hill & Buss, 2006). Because individuals are evaluated by potential mates in the immediate context of how well they compare to other same-sex individuals, it is arguably more important (and evolutionarily adaptive when survival is not threatened) to be concerned with how well one stacks up against their peers rather than with obtaining high absolute amounts of key qualities. Similarly, I contend that women's efforts to enhance their appearance may be

motivated more by competition with other women than by the allure of potential mates themselves – even though mating success is ultimately the goal of such activities.

Ovulation – A Window of Fertility and Intrasexual Competition

Given that female reproductive viability is constrained not only in terms of total years (i.e., fertility declines precipitously at age 35; Bunting & Boivin, 2008), but also by the brief window within each menstrual cycle when an oocyte is fertilizable (Lipson & Ellison, 1996; Yoshimura & Wallach, 1987), women's behaviors may have especially large reproductive consequences around the time of ovulation. Indeed, a significant body of research has shown that women's mating psychology is sensitive to fertility status and, near ovulation, women's motivations and behaviors shift in adaptive ways (see Gangestad, Thornhill, & Garver-Apgar, 2005b for a review). For instance, near ovulation women are more attracted to men with symmetrical and masculine faces (Penton-Voak & Perrett, 2000; Penton-Voak, Perrett, & Castles, 1999; Thornhill & Gangestad, 2003; Thornhill et al., 2003), those who display greater social dominance (Gangestad, Simpson, Cousins, Garver-Apgar, & Christensen, 2004), and those possessing deeper voices (Puts, 2005). All of these markers are thought to signal a man's underlying genetic fitness but likely also serve as cues to a man's current health and resource holding potential. As such, female preference for these specific males traits likely arose because of the direct benefits these traits are associated with, such as the higher quality resources these men provide to their partners and resulting offspring (cf. Kirkpatrick & Barton, 1997). Additional evidence indicates that the ovulatory increase in preference for these traits is directed toward non-primary partners (Gangestad, Thornhill & Garver, 2002), particularly if a woman's primary partner lacks specific indicators of genetic fitness (cf. Garver-Apgar, Gangestad, Thornhill, Miller, & Olp, 2006).

However, emerging research on the ovulatory cycle suggests that women's mating-related behaviors may be directly motivated *not* by the allure of potential mates, but rather, by intrasexual competition. For example, Fisher (2004) found that, compared to other cycle points, women rated photographs of other women as lower in attractiveness mid-cycle. Fisher interpreted this finding to suggest that women are derogating their competitors when fertility is highest. In another study, women were less likely to share a monetary award near ovulation and more likely to reject a low offer to share a stake of the award with another woman (Lucas, Koff, & Skeath, 2007). The authors interpreted this result as evidence that women may be prone to compete with other women for material resources near ovulation. Taken together, both studies suggest that at the most fertile point in the cycle, female-female competition may be especially strong.

Most recently, research has found that near ovulation, women use clothing to enhance their appearance. For instance, photographs of women near ovulation were rated as "trying to look more attractive" compared to photographs of the same women at low fertility points in the cycle (Haselton, Mortezaie, Pillsworth, Bleske, & Frederick, 2007). Further, Durante et al. (2008) informed women that they would be attending a party that evening where single, attractive people would be in attendance. The women were then told to sketch the outfit they would wear onto a paper doll using colored pencils. Near ovulation, women sketched outfits that were significantly more revealing and sexy than when not near ovulation, and this effect was strongest for single women. The authors argued that these results suggest that women become more intrasexually competitive when fertility within the cycle is highest. However, neither that study nor any other research to date has directly examined the underlying motivation behind fertility-induced shifts in choice of dress. In addition, no research has yet examined the effects of

ovulation on consumer behavior. Building on these findings, the current research set out to investigate 1) whether women's purchases of sexy clothing and accessories would vary depending on fertility status in the ovulatory cycle, and 2) whether such ovulatory shifts in appearance-enhancing behavior are directly motivated by mating or by intrasexual competition.

The Function of Ovulatory Shifts in Choice of Dress: Competing Hypotheses

There are three competing explanations for menstrual cycle-related shifts in clothing preference. First, shifts in choice of dress may simply be a by-product of cyclic hormonal fluctuation. Shifts in clothing preference may reflect hormone-mediated changes in motivation resulting from cycle shifts in sexual interest and sociability (e.g., Fessler, 2003; Gangestad et al., 2002). That is, women may generally feel greater sexual desire around the time of ovulation and thus, may be motivated to dress more attractively. Second, under certain conditions, women may pay more attention to their attire to attract an extra-pair partner. Along these lines, previous research has found stronger cycle shifts in sexually related female behavior for mated women (Havlicek, Roberts, & Flegr, 2005; Pillsworth, Haselton, & Buss, 2004; also see Little, Jones, Penton-Voak, Burt, & Perrett, 2002). Researchers reasoned that shifts in desires and preferences across the cycle (e.g., increased desire for men other than one's primary partner) may be designed to secure genetic benefits for offspring through an extra-pair copulation (EPC) with a mate displaying indicators of good genes (Gangestad, Thornhill, & Garver-Apgar, 2005a; Haselton & Gangestad, 2006; Pillsworth & Haselton, 2006). Third, ovulatory shifts in choice of dress may reflect an increase in intrasexual competitiveness at high fertility. That is, motivation to compete intrasexually and thus, to be more attractive for potential mates, may be high especially at the time when conception is most likely.

Intersexual Courtship vs. Intrasexual Competition

Fertility-induced shifts in women's motivations and behaviors likely reflect adaptations that arose via sexual selection processes and, thus, have reliably enhanced women's reproductive success across human evolutionary history. That is, women who experience certain shifts in specific motivations and behaviors (e.g., an increase in motivation to appear more attractive) near ovulation enhance their ability to attract a high quality mate when conception probability is highest. Biologists identify two distinct pathways of sexual selection that can augment an individual's reproductive success: *intersexual* courtship and *intrasexual* competition (Andersson 1994). *Intersexual* courtship involves members of one sex participating in behaviors that directly attract members of the opposite sex. For example, when given a mating-relevant motivation (e.g., the presence of attractive women), men are driven to conspicuously consume luxury goods and services in order to display their ability to acquire resources that are highly desired by women (Griskevicius et al., 2007). *Intrasexual* competition, on the other hand, involves members of the same sex competing amongst each other to become the most desired by the opposite sex. For example, men are motivated to engage in face-to-face confrontations with other men in order to boost their relative status or reputation which, in turn, often leads to greater access to highly desired women (Griskevicius et al., 2009).

At first glance, *intersexual* courtship and *intrasexual* competition seem quite similar in that both motives are clearly linked to reproductive success (i.e., attracting high quality mates). Thus, activating a courtship or competition motive might produce very similar behavioral displays. However, the relative costs associated with courtship and competition can be very different depending on the currently activated biological motivation system (e.g., increased or decreased fertility) and the dynamics of the current social situation (e.g., presence or absence of

highly attractive same-sex peers). If women are spending more money on and wearing sexier clothing near ovulation, who is the intended audience for such displays? Do women dress sexier at ovulation to attract men (*intersexual* courtship) or to best other women (*intrasexual* competition), or both?

The primary distinction between *intersexual* courtship and *intrasexual* competition lies in the intended audience of the behavioral display. Consequently, one way to disentangle the underlying function of ovulatory shifts in choice of dress is to employ a priming methodology. The evolved architecture of the human mind should be sensitive to changes in environmental conditions and enable adjustments to motivations and behaviors when specific adaptive problems arise (Kenrick, Li, & Butner, 2003; Shaller, Park, & Mueller, 2003). Research has shown that ecological cues can subconsciously activate goal states (e.g., mating, self-protection) and effectively shift behavior, including consumer-related motivations (e.g., Chartrand et al., 2008; Goldstein, Cialdini, and Griskevicius, 2008; Griskevicius et al., 2009). Mating-related cues have been shown to induce motivations and behaviors that are associated with mating success. For example, when men are primed with photographs of attractive women they are more likely to participate in conspicuous consumption, displays of wealth, and monetary discounting (Griskevicius et al., 2006, 2007; Roney, 2003; Wilson & Daly, 2004). I reasoned that, if attractive opposite-sex others activate behavior aligned with mating success (i.e., *intersexual* courtship), photographs of attractive, same-sex others should activate behaviors and motivations aligned with successful *intrasexual* competition.

When Do Women Dress to Impress Other Women?

On the surface, it appears that women are going to great lengths to enhance their physical appearance to attract men near ovulation. However, it is possible that women may actually be

more directly concerned with besting other women when fertility is highest. Because women compete with one another by attempting to enhance their attractiveness (Campbell, 2004), ovulatory-induced shifts in motivation to appear attractive may reflect an increase in *intrasexual* (female-female) competition. Across species, fertility status positively predicts the intensity of intrasexual competition for access to mates (Low, 2000; Palagi, Telara, and Tarli. 2004). That is, motivation to compete intrasexually is especially high at the time when conception is most likely and, thus, the reproductive benefits that stand to be gained outweigh the costs. Conversely, when fertility is low, the reproductive gains are minimal and the costs may outweigh any potential benefit. This may be especially true when local, same-sex peers are thought to be highly attractive. The cost of expending energy to enhance attractiveness relative to highly attractive same-sex peers may be perceived as too steep when fertility is low and the expected payoff is negligible. If women's mating psychology is indeed calibrated to hormones that regulate fertility, a drop in specific hormone levels may signal the brain to down-regulate energetic expenditures on mating when the probability of a successful outcome is low.

Research Overview

To examine the effect of intra-individual fertility on women's purchases of appearance-enhancing clothing and accessories and whether such consumer behavior is motivated more directly by intrasexual competition versus mating, I conducted a series of three studies with fertility status (high versus low fertility) as a within-subject variable. A consumer purchasing paradigm was used to track women's spending patterns across varying budgets using fashion items that likely enhance a woman's ability to attract a mate and effectively compete with same-sex rivals.

Study 1 was designed to investigate shifts in women's spending patterns towards sexy versus non-sexy clothing and accessories across the cycle and measure the presence or absence of ovulatory shifts across varying budgets (low, medium, and high). Studies 2 and 3 were designed to directly test the hypothesis that the ovulatory shift in choice of dress is a reflection of an increase in intrasexual competitive tactics at high fertility. To do this, I examined the influence of attractive same-sex peers (Study 2) and attractive men (Study 3) on women's purchasing behavior at high and low fertility.

PREDICTIONS DERIVED FROM THE OVULATORY SHIFT HYPOTHESIS

Prediction 1: When given varying budgets (e.g., low, medium, and high), the ovulatory shift in favor of sexy and revealing items will be stronger for the high budget than for the low budget. When budgets are high, a large portion of one's income can be allotted to the purchase of luxury items. In contrast, when budgets are low (or constrained), individuals tend to purchase only those items that are of greatest need. When applying principles of economics to decisions regarding romantic relationships, it was found that men and women differ in the priority placed on certain characteristics when selecting a long-term mate (Li, Bailey, Kenrick, & Linsenmeier, 2002). Participants were given low, medium, and high budgets of "mate dollars" to purchase characteristics pertaining to an ideal long-term mate. Men and women differed profoundly when operating from a constrained low budget. Women spent significantly more on resource-related characteristics, whereas men prioritized physical attractiveness. Only when additional income (mate dollars) became available did spending on resources and physical attractiveness decrease and spending on what were deemed "luxury" characteristics (e.g., creativity, friendliness) increase.

In terms of clothing, items such as stiletto heels, pencil skirts, and lingerie tops are likely not considered necessities. In contrast, items that such as loafers, jeans, and t-shirts, may be considered more practical, and therefore necessary for regular, day-to-day activity. Items in the former list may be considered luxuries in that they are not needed to clothe one's self as a day-to-day necessity but may function to augment perceived attractiveness or status. Thus, when operating on a constrained budget, it is not predicted that women's purchases will differ between high and low fertility. However, it is predicted that as budgets increase, so too will spending on sexy and revealing clothing and accessory items under high fertility versus low fertility.

Prediction 2: Single women will show a stronger shift in favor of sexy and revealing items when nearest to ovulation. Durante et al. (2008) found that when women were at high fertility, they preferred revealing clothing for school and for a social event, more than when the women were at low fertility. This was especially true for single rather than partnered women, thereby suggesting that shifts in choice of clothing may reflect shifts in social motivations that are more relevant to single than to partnered women. Single women are solving a very different set of adaptive problems than women who are already in committed relationships. Whereas partnered women may compete intrasexually to stave off interlopers, extract resources for their primary partner, or perhaps lure short-term partners that are of higher quality than their current mate, single women compete intrasexually to, first and foremost, increase the probability of being chosen by a high quality, long-term partner. In particular, single women may have greater reason to compete on the mating market than women who are partnered; thus, it is predicted that the purchasing of sexy and revealing clothing near ovulation may be strongest for single women.

Prediction 3: Women lower in self-perceived attractiveness will purchase more revealing and sexy items near ovulation compared to women higher in self-perceived attractiveness.

Women of lower self-perceived attractiveness experience a stronger shift in preference for revealing and sexy clothing near ovulation (Durante et al., 2008). It is possible that an ovulatory increase in clothing sexiness may have the biggest potential return for those of low attractiveness. Wearing short skirts and low cut tops can be risky – revealing too much skin may attract unwanted attention from undesirable men or lead to reputational damage for appearing promiscuous. Given these costs, the marginal benefit of revealing more skin may be too small for women who are already able to compete effectively (i.e., women high in attractiveness). Thus, it is predicted that women of low to average self-perceived attractiveness to exhibit a stronger effect of fertility on the purchasing of sexy and revealing items.

Prediction 4: Woman who have not experienced sexual intercourse, or who are sexually restricted (as measured by the Sociosexual Orientation Inventory - SOI) will not show an ovulatory shift in purchasing behavior in favor of items that are sexy and revealing.

Psychological mechanisms regulating female behavioral changes during the fertile window may be sensitive to sexual experience. It is not until a woman is sexually active that a problem like retaining choice over the biological father of offspring, promoting male investment in the relationship, or being able to compete with other women to secure a high-quality mate would become crucial. Further, previous research documented that women at a discotheque were aware of the social signals conveyed through their clothing choice and that a woman's choice for revealing and sheer clothing was predictive of her motivation for sex (Grammer, Renninger, & Fischer, 2004). Other findings suggest that women who are more open to casual sexual encounters desire outfits that are more revealing and wear clothing that is sexier specifically at high fertility (Durante et al., 2008). Therefore, it is predicted that sexually experienced women

and/or women with an unrestricted sociosexual orientation will show a stronger shift in purchasing behavior at high fertility.

Prediction 5: Women will show a stronger shift in purchasing behavior near ovulation after viewing and rating photographs attractive females as opposed to photographs of females of average attractiveness or landscapes. Women compete with one another by drawing attention to and altering their appearance (Walters & Crawford, 1994; Cashdan, 1998). As such, women should be more inclined to alter their appearance-related consumer behavior in the presence of attractive same-sex rivals, as opposed to rivals of average attractiveness or landscapes. Thus, it is predicted that women will respond to images of attractive females who may be viewed as rivals and alter their purchasing behavior in favor of items that are sexier and more revealing at high fertility. In contrast, it is predicted that images of women of average attractiveness will not elicit the same response.

Prediction 6: The ovulatory shift in the purchase of sexy fashion items will be absent after viewing photographs of potential mates (attractive males). Previous research has found changes in men's consumer behavior and monetary risk-taking after introduction of a mating-related prime (e.g., photographs of attractive females) but has failed to find parallel changes for women (Wilson & Daly, 2004; Griskevicius et al., 2007). Men tend to respond to visual cues that signal the possibility of a sexual encounter with potential mates (Symons, 1979; Hertz & Cahill, 1997). In contrast, women generally have less to gain through casual sexual encounters (e.g., Buss & Schmitt, 1993) and, having more to lose from choosing the wrong partner, may be less directly motivated to alter their behaviors after simply seeing potential mates. Thus, it is predicted that the increase in purchase of sexy fashion items will be absent after viewing photographs of men.

Prediction 7: The influence of attractive same-sex rivals on purchasing behavior will be strongest when the rivals are from one's local social network. Over the course of human evolutionary history, social interaction was limited to the people living within one's local environment. For much of human history, long-distance travel and communication were, for the most part, unfeasible and therefore, likely unimaginable. When engaging in social exchange and competition, we should be chiefly concerned with those who live in relatively close proximity to us and who we are likely to encounter during day-to-day activity. It is predicted that women who, prior to testing, view and rate photographs of attractive females thought to be students at their own school (UT-Austin) will show a stronger effect of fertility on purchasing behavior than women who view and rate photographs of attractive females thought to be students at another school of comparable status (University of Michigan).

Prediction 8: The influence of attractive same-sex rivals on purchasing behavior will be strongest for single women. As mentioned above, single women may have greater reason to compete on the mating market than women who are partnered. Thus, the presence of same-sex rivals should have greater implications for the mating strategies of single women. As such, it is predicted that single women, more so than partnered women, will show a greater effect of attractive same-sex rivals on purchasing behavior at high fertility.

The following table compares the predicted effects of two key variables on the magnitude of ovulatory shifts, derived from each competing hypothesis regarding the function, if any, of ovulatory shifts in clothing choice. For example, under the intrasexual competition hypothesis, ovulatory shifts are expected to be greater (sexier and more revealing clothing during high versus low fertility) when women are single versus when they are partnered.

Table 1.

When ovulatory shifts are expected to be moderated: Comparisons of predictions derived from competing hypotheses regarding the function of the ovulatory shift in choice of dress.

Independent Variable	Hypothesis		
	By-product	Genetic Benefits/EPC	Intrasexual Competition
Women's relationship status	Single = Partnered	Single < Partnered	Single > Partnered
Presence of others: same-sex competitors vs. potential mates	Attractive women = Attractive men	Attractive women < Attractive men	Attractive women > Attractive men

STUDY 1: TESTING THE OVULATORY SHIFT IN PURCHASING

Previous research has found that women attempt to look more attractive at high fertility compared to low by altering their choice of clothing (Durante et al., 2008; Haselton et al., 2007). If women are paying more attention to their choice of dress near ovulation, presumably to attract a high-quality mate - I reasoned that their purchasing behavior should also shift in favor of clothing and accessories that are more revealing and sexy. To test this, a simulated, online shopping program was designed such that participants could purchase clothing and accessories from three distinct budgets. When applying principles of economics to decisions regarding romantic relationships, participants were given low, medium, and high budgets of “mate dollars” to purchase characteristics pertaining to an ideal long-term mate (Li et al., 2002). It was found that men and women differed profoundly when operating from a constrained low budget.

Women spent significantly more on resource-related characteristics and men spent more on physical attractiveness. Only when additional income (mate dollars) became available did spending on resources and physical attractiveness decrease and spending on what were deemed “luxury” characteristics (e.g., creativity, friendliness) increase.

Sexy clothing items such as stiletto heels, pencil skirts, and lingerie tops are not generally considered clothing necessities, but rather, luxuries. However, single women or women actively searching for a mate, may consider sexier clothing to be more of a necessity or priority when shopping for clothing and accessories. As such, for Study 1, I predicted that (1) as budgets increase, relative spending on sexy and revealing clothing and accessory items at high versus low fertility will become larger; (2) at high versus low fertility, single women, as opposed to mated women, will show a stronger shift in favor of sexier clothing and accessory items; and (3) when operating from a low (or constrained) budget, single women will show a stronger fertility-induced shift in spending on sexy fashion items .

Method

Participants

Participants were 52 female undergraduates at the University of Texas, Austin. All women were 17 to 22 years of age ($M=19.0$, $SD=1.31$) and normally ovulating (not using the pill or other hormonal contraceptive). Participants were compensated with research credit for a psychology course or with \$30. All 52 participants completed high fertility on the day of their luteinizing hormone surge (LH; a pituitary hormone that peaks 24-48 hours prior to ovulation) and no later than four days following their LH surge and were considered to be fertile at the time of high fertility testing (after Durante et al., 2008). One-hundred three participants were originally recruited for this study. However, 32 participants did not complete both testing

sessions and 19 participants failed to show evidence of a surge in LH. An effort was made to complete high fertility testing on the day of the participant's LH surge or the day of ovulation. On average, high fertility testing sessions took place .71 days after the LH surge ($SD=1.18$) and .29 days before day-of-ovulation ($SD=1.18$). Low fertility sessions were scheduled seven days or more after the LH surge or at least three days before onset of their menstrual periods. On average, low fertility testing sessions took place 4.46 days prior to menses ($SD=3.22$). Twenty-nine participants completed high fertility testing first and 23 completed low fertility testing first.

Design and Procedure

The overall design of the experiment was a 2 (Session: high vs. low fertility) x 2 (Budget: low vs. high) x 2 (Relationship Status: single vs. in a relationship) mixed-factorial design with differences in the number of sexy fashion items purchased across budgets at high versus low fertility as the dependent variable. A key predictor variable in this research was fertility within the cycle. Therefore, women were prescreened over the telephone, and only women who reported regular monthly menstrual cycle (e.g., cycles running 25-35 days) and were not on any form of hormonal contraception were recruited for participation in the study.

On the basis of the information women provided about their cycles during the telephone prescreening interview, each participant was scheduled to come into the lab for two experimental sessions – one on an expected high fertility day and one on an expected low fertility day. Women also reported to the lab to complete LH tests (over-the-counter urine applicator tests--Clearblue[®] Easy Ovulation Test Kit). The first urine test was scheduled two days before the expected day of ovulation. If an LH surge was not detected, women came back each day until an LH surge was detected or six tests had been completed, whichever came first. If any of the six days required to

detect ovulation fell on a weekend, the participant was given testing sticks and directions to take the test at home and return it to the lab on Monday.

The format of each session remained constant between high- and low-fertility testing. At the start of each testing session, participants were presented with a simulated, online shopping program. The shopping program contained photographs of 130 items. Items included clothing, undergarments, shoes, jewelry, and other accessories found on the websites of leading retailers of women's fashion. The items were pre-rated by three research assistants, blind to the purpose of the research, for how revealing and sexy they appear. Ratings were based on a 9-point scale with anchors: 1 = Not at all revealing/sex; 9 = extremely revealing/sexy (revealing – $\alpha = .956$; sexy – $\alpha = .894$; composite – $\alpha = .965$). Jewelry, shoes, and handbags were rated for sexiness only. Any item that received a sexy and revealing rating above the median of 5 was considered an item high in sexiness. Sixty-four consumer items were considered *low* in sexiness/revealingness and 66 items were considered *high* in sexiness/revealingness. In an effort to control for pricing confounds, participants used a point system to make purchases. Each item on the shopping program webpage was worth 1 point. Participants were given the following instructions:

You have **10 points** to spend toward item(s) of your choosing. Each item pictured below costs **1 point**.

When shopping, select items you would like to own for yourself and take home with you today. For this portion of the task, do not spend less than or more than **10 points**. Simply click the item to select it. If you change your mind, you can click the item again to deselect it.

When you are finished you will submit your choices and be taken to the next page. Please follow the instructions given to you on the pages that follow.

Participants were given three varying budgets. First, participants were given a low budget (10 points to spend). After completing the first round of purchasing, participants were then given 10 more points to spend on additional items (for a total of 20 points to spend). Finally, participants were given another 10 points (for a total of 30 points to spend). Participants were unaware of the impending budget increases during their first testing session. The shopping program allowed participants to change their low budget purchases once the budgets expanded. However, participants were not instructed that they would be able to alter their purchasing decisions and low budget purchases were recorded separately. The program recorded all changes made to selected items as the budgets increased. Two versions of the shopping program were created and participants viewed the same items in reverse order at the second testing session.

Finally, participants completed several biographical measures. Participants completed a romantic relationship survey that obtained information regarding the participant's sexual history, current romantic relationship and relationship history. In addition, participants completed the *Sociosexual Orientation Inventory* (SOI; Simpson & Gangestad, 1991). This scale measures an individual's willingness to have sexual intercourse without commitment (composite: $\alpha=.970$). Item 4 asks "How often do you fantasize about having sex with someone other than your current dating partner?" Because this item pertains only to participants currently involved in a romantic relationship, it was dropped so that SOI scores could be obtained for all women in the sample (after Durante et al., 2008). Participants also answered questions designed to assess self-

perceived desirability compared to same-sex peers (after Durante et al., 2008). All items were rated on a 9-point scale. Three items were used to form an average composite attractiveness score: (1) “compared with most women, how attractive is your body to men?” (anchors: 1 = not all attractive, 9 = extremely attractive); (2) “compared with most women, how attractive is your face to men?” (anchors: 1 = not all attractive, 9 = extremely attractive); and (3) “compared with most women, how sexy would men say you are?” (anchors: 1 = not at all sexy, 9 = extremely sexy).

Results

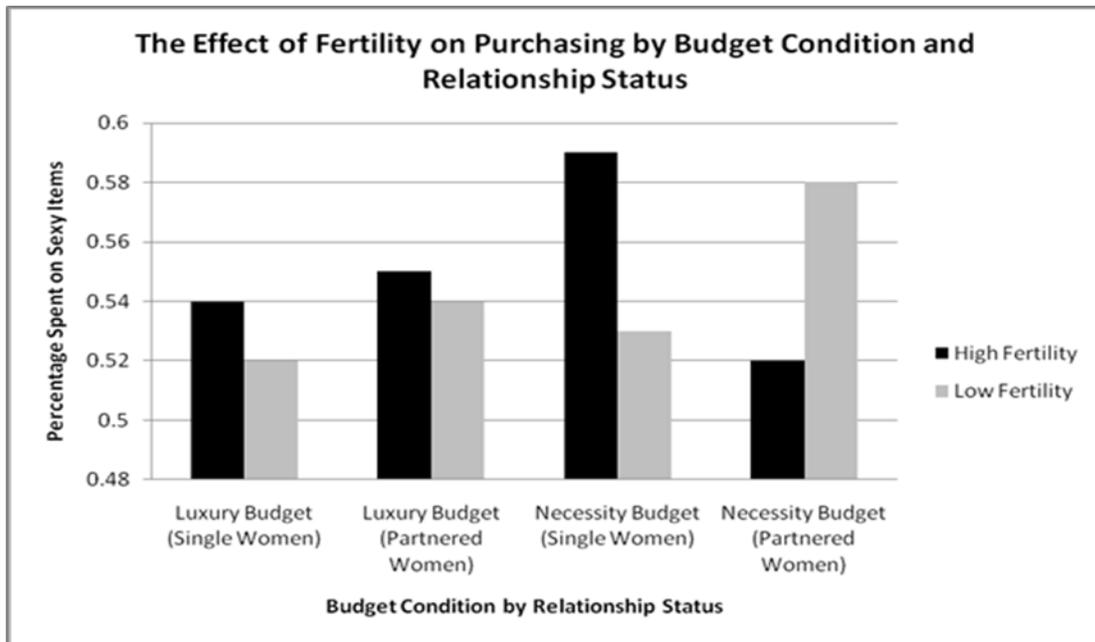
To investigate whether or not spending on sexy and revealing fashion items is a necessity or a luxury, differences in spending patterns on the low (necessity-based) and high (luxury-based) budget were examined. The total number of sexy and revealing items purchased from the low and high budgets were summed and converted into a percentage score. Differences in sexy and revealing purchases across budgets and fertility were examined using repeated measures ANOVA (GLM; SPSS 15.0) with “session” (high versus low fertility) and “budget” (low and high) as repeated factors. The above base model for primary analysis included relationship status (single vs. in a relationship; single $n=31$; in a relationship $n=21$) as a between-subjects factor. Secondary analyses included the sexual experience variable (had sex vs. not had sex; had sex $n=33$; not had sex = $n=19$) as an additional between-subjects factor and self-perceived attractiveness and SOI score as continuous, independent variables.

The repeated measures ANOVA revealed a two-way interaction between session and relationship status, $F(1, 49)=7.74, p=.008, \eta^2=.14$. Single women were purchasing sexier and more revealing fashion items at high fertility ($M=.56; SD=.19$) compared to low fertility

($M=.52$; $SD=.19$, $F(1, 29)=7.75$, $p=.009$. There was no significant effect of fertility on purchasing for women in relationships (high fertility – $M=.53$, $SD=.22$; low fertility – $M=.55$, $SD=.22$), $p=.21$.

Further, consistent with predictions, a significant three-way interaction between session, budget, and relationship status, $F(1, 49)=6.58$, $p=.013$, $\eta^2=.12$, indicated that the predicted fertility-induced shift in purchasing behavior for single women was strongest for low-budget (necessity-based) spending, $F(1, 30)=6.30$, $p=.018$.

Figure 1. The effect of fertility on purchasing behavior as a function of relationship status.



Sexual Experience and Purchasing

There was no interaction between fertility session, budget, and sexual experience. However, for low budget spending, there was a marginal session x sexual experience interaction, $F(1, 48)=2.88$, $p=.09$, $\eta^2=.06$. Women who had experienced sexual intercourse were spending

more of their budget on sexy and revealing items at high fertility ($M=.58$, $SD=.25$) compared to low fertility ($M=.55$, $SD=.22$). The reverse was true for women who had not yet experienced sexual intercourse (high fertility – $M=.51$, $SD=.40$; low fertility – $M=.56$, $SD=.36$). There was no interaction between session and sexual experience for high budget spending.

Self-perceived Attractiveness and Purchasing

There was a marginal interaction between fertility session and self-perceived attractiveness, $F(1, 46)=3.89$, $p=.07$, $\eta^2=.07$, indicating that women of lower attractiveness were spending more on sexy and revealing fashion items at high fertility compared to low fertility, corresponding partial $r(47)=-.28$. Self-perceived attractiveness did not moderate the effect of fertility on purchasing across budgets.

SOI and Purchasing

SOI score did not moderate the effect of fertility on purchasing behavior, $p=.24$.

Discussion

Study 1 found that women purchased more sexy and revealing items at high fertility compared to low when operating from a low budget. Prediction 2 was confirmed: single women showed a stronger effect of fertility on preference for revealing and sexy clothing and accessories. The fertility-induced shift in spending for single women was strongest when operating from a low (or constrained) budget. This result suggests that sexy attire is a necessity rather than a luxury for single women when fertility within the cycle is highest.

Regarding Predictions 3 and 4, sexual experience and self-perceived attractiveness marginally influenced the effect of fertility on purchasing behavior but neither interaction was significant. SOI score did not moderate the effect of fertility on purchasing.

Although Study 1's results were mostly consistent with predictions, there are at least three competing explanations for the observed shift in women's clothing preferences near ovulation. First, shifts in choice of dress may be the result of hormone-mediated changes in sexuality and feelings of attractiveness (Gangestad et al., 2002; Haselton & Gangestad, 2006). In other words, women may be more motivated to dress up simply because they feel greater sexual desire near ovulation. Second, previous work examining shifts in women's mating motivations across the cycle has found that women experience increased interest in men other than their primary partners near ovulation and are more likely to have an extra-marital affair at high fertility (e.g., Baker & Bellis, 1995; Bellis & Baker, 1990; Gangestad et al., 2002; Gangestad et al., 2005a; Pillsworth & Haselton, 2006). Researchers have reasoned that shifts in women's motivations and behaviors at high fertility (e.g., increased sexual desire and preference for extra-pair partners) operate to secure genetic benefits for offspring through attracting and mating with a man of higher genetic quality than the primary partner. As such, fertility-induced shifts in choice of dress may reflect behavior designed to attract men high in genetic fitness. Third, whereas previous research on cycle shifts has found stronger effects for mated women, I found that single women show a stronger effect of fertility on clothing preference. This pattern of results, coupled with previous findings (cf. Durante et al., 2008), is consistent with the possibility that women experience an increase in motivation to compete intrasexually on attractiveness at high fertility. Thus, the ovulatory shift in favor of sexier clothing and accessories may reflect an increase in intrasexual competition tactics with the goal of appearing more attractive than same-sex rivals to potential mates.

Although the pattern of findings from Study 1 is consistent with a general intrasexual competitiveness explanation, the precise function of fertility-induced shifts in choice of dress

was not directly tested. Therefore, I investigate the influence of same-sex peers on women's spending patterns in Study 2.

STUDY 2: TESTING THE INFLUENCE OF SAME-SEX PEERS ON PURCHASING

Coupled with previous research, the results of Study 1 suggest the operation of evolved mechanisms connected to cycling fertility; however, the exact function of the ovulatory shift in clothing preference remains unclear. Study 2 was designed to directly test the hypothesis that the shift in clothing preference at high fertility reflects an increase in intrasexual competition.

The evolved architecture of the human mind should be sensitive to changes in environmental conditions and enable adjustments to motivations and behaviors when specific adaptive problems arise (Kenrick, Li, & Butner, 2003; Shaller, Park, & Mueller, 2003). Research has shown that ecological cues can subconsciously activate goal states (e.g., mating motivations) and effectively shift behavior (e.g., Chartrand & Bargh, 2002). Mating-related cues (e.g., photographs of attractive opposite sex others) have been shown to induce motivations and behaviors that are associated with mating success (Griskevicius et al., 2006, 2007; Roney, 2003; Wilson & Daly, 2004). I reasoned that, if attractive opposite-sex others activate behavior aligned with mating success, photographs of attractive, same-sex others should activate behaviors and motivations aligned with successful intrasexual competition. Thus, if the ovulatory shift in clothing preference is a reflection of a fertility-induced increase in intrasexual competition, viewing photographs of attractive same-sex others should strengthen the effect of fertility on the purchase of sexy fashion items.

Further, successfully out-competing rivals is likely most relevant within one's current social network. Because a woman in Texas is not in direct competition with a woman from Michigan for access to high-quality, investing male partners, the brain mechanisms responsible

for motivating intrasexual competitive behavior are likely most sensitive to those who are immediate threats to reproductive success. I predicted that the effect of fertility on women's spending patterns will be most pronounced after viewing and rating photographs of attractive women, particularly if the women in the photographs are thought to be students at the participant's university. Additionally, I predicted that attractive rivals will induce a fertility effect for low budget, necessity-based spending.

Method

Participants

Participants were 59 female undergraduates at the University of Texas, Austin between the ages of 17 to 27 years ($M = 18.67$; $SD=1.67$). All were normally ovulating and not on hormonal contraceptives. Recruitment procedure followed as described in Study 1. One-hundred two participants were originally recruited for this study. However, 20 participants failed to complete both testing sessions and 23 participants did not show evidence of a surge in LH. High fertility testing sessions took place, on average, .78 days after a surge in LH ($SD=.81$) and .24 days before day-of-ovulation ($SD=.77$). On average, low fertility testing sessions took place 4.76 days prior to menses ($SD=3.56$). Thirty-four participants completed high fertility testing first and 25 completed low fertility testing first.

Design and Procedure

The overall design of this study was a 2 (Fertility Session: High vs. Low fertility) x 2 (Budget: Low vs. High) x 5 (Prime Condition: Attractive Females Local, Attractive Females Distant, Average Females Local, Average Females Distant, Landscapes) mixed-factorial design with differences in the number of sexy fashion items purchased across budgets at high versus

low fertility as the dependent variable. The procedure followed that described in Study 1 with the addition of the intrasexual competition prime. Prior to the shopping task, participants viewed and rated photographs in one of five conditions. Participants were assigned to either (1) view and rate 10 facial photographs of same-sex others from the University of Texas, Austin who are high in physical attractiveness; $n=11$ (2) view and rate 10 facial photographs of same-sex others from the University of Texas, Austin who are average in physical attractiveness; $n=9$ (3) view and rate 10 facial photographs of same-sex others from the University of Michigan who are high in physical attractiveness; $n=13$ (4) view and rate 10 facial photographs of same-sex others from the University of Michigan who are average in physical attractiveness; $n=13$ (5) or view and rate 10 photographs of landscapes prior to the shopping task; $n=13$.

For the photographs of same-sex others, participants were given the following instructions:

We are currently running a study designed to assess how individuals determine their own self-perceived physical attractiveness. Our primary goal is to see how accurately individuals can measure their own physical attractiveness and how similar self-ratings of physical attractiveness are to outsider-ratings of physical attractiveness.

In this task you will be presented with a series of 10 photographs of individuals who participated in a separate research study that is currently being conducted at the University of Michigan (University of Texas, Austin).

You will be asked to view the photographs and rate them using the questions and rating scales provided below the picture.

For each photograph, participants answered the following questions: (1) “compared with most women, how attractive is this woman’s face to men?” (anchors: 1 = not at all attractive, 9 = extremely attractive); (2) “compared with most women, how sexy would men say this woman is?” (anchors: 1 = not at all sexy, 9 = extremely sexy); and (3) “compared with most women,

how friendly would you say this woman is?” (anchors: 1 = not at all friendly, 9 = extremely friendly). Participants rated the same photographs prior to the shopping task at each testing session. Photographs were presented in reverse order during the participants second testing session.

For the photographs of landscapes, participants were given the following instructions:

We are currently running a study designed to measure how accurately individual assessments of visual photography predict overall opinion of a photograph’s artistic beauty.

In this task you will be presented with a series of 10 photographs. You will be asked to view the photographs and rate them using the questions and rating scales provided below the picture.

For each photograph, participants answered the following questions: (1) “compared with other photographs of landscapes, how visually attractive is this photograph?” (anchors: 1 = not attractive, 9 = very attractive); (2) “compared with other photographs of landscapes, how calming is this photograph?” (anchors: 1 = not calming, 9 = very calming); and (3) “compared with other photographs of landscapes, what is the overall quality of the photograph?” (anchors: 1 = low quality, 9 = high quality).

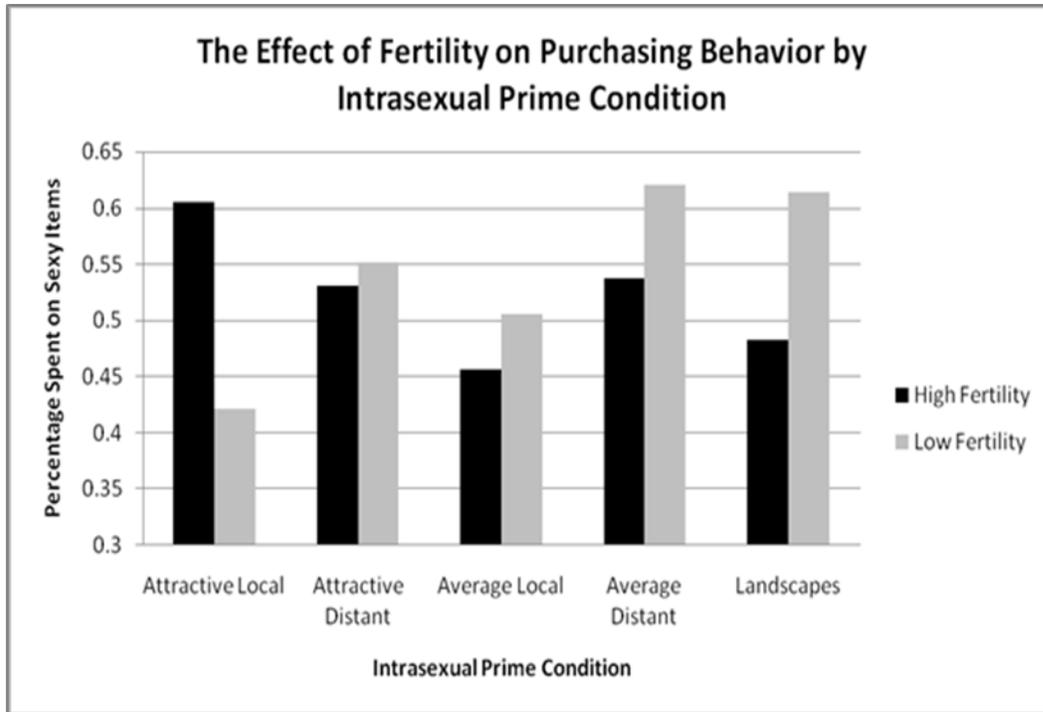
Although participants were told the individuals in the photographs were University of Texas or University of Michigan students, photographs were obtained from public online domains (e.g., www.hotornot.com) and pre-rated for physical attractiveness on a 9-point scale. Three male and 13 female research assistants, blind to the purpose of the research, rated all photographs for physical attractiveness. Mean attractiveness rating for the attractive female photographs was 7.47 ($SD = .54$) and mean attractiveness rating for the average female photographs was 4.25 ($SD = .69$) (attractive - $\alpha=.763$; average - $\alpha=.870$).

Results

Again, the total number of sexy and revealing items purchased from each budget was summed and converted into a percentage score. Differences in sexy and revealing purchases across budgets and fertility were examined using repeated measures ANOVA (GLM; SPSS 15.0) with “session” (high vs. low fertility) and “budget” (low vs. high) as repeated factors. The above base model for primary analysis included “prime condition” (attractive local females, attractive distant females, average local females, average distant females, and landscapes) as a between-subjects factor.

As predicted, there was a 2-way interaction of fertility session X prime condition, $F(4, 52)=3.75, p=.009, \eta^2=.22$, indicating that more sexy and revealing fashion items were purchased at high fertility compared to low fertility for women who viewed and rated photographs of attractive, same-sex others thought to be students at the participant’s university. A 3-way interaction between fertility session, budget, and stimuli-type indicated that the shift in spending pattern at high fertility in the attractive, local stimuli condition was strongest for low-budget spending but this finding did not reach conventional significance, $F(4, 52)=1.88 p=.13, \eta^2=.13$.

Figure 2. The effect of fertility on purchasing behavior as a function of prime condition.



To further examine the effect of viewing attractive same-sex others on women's spending patterns, the attractive female conditions ($n=18$) and average female conditions ($n=26$) were collapsed across university location (UT vs. UM). Again, a 2-way interaction between fertility session and stimuli-type (attractive vs. average female photographs) indicated that a greater number of sexy and revealing items were purchased at high fertility compared to low fertility for women who viewed and rated attractive female photographs prior to the shopping task (attractive prime: high fertility - $M=.57$, $SD=.27$; low fertility, $M=.48$, $SD=.29$; average prime: high fertility - $M=.50$, $SD=.22$; low fertility - $M=.56$, $SD=.24$), $F(1, 42)=5.45$, $p=.024$, $\eta^2=.12$ (see Figure 3). A 3-way interaction between fertility session, budget, and stimuli-type, $F(1, 42)=4.16$, $p=.048$, $\eta^2=.09$, indicated that the fertility-induced shift in spending found in the attractive female condition was most pronounced for low-budget spending (Figure 4).

Figure 3. The effect of fertility on spending as a function of female prime condition.

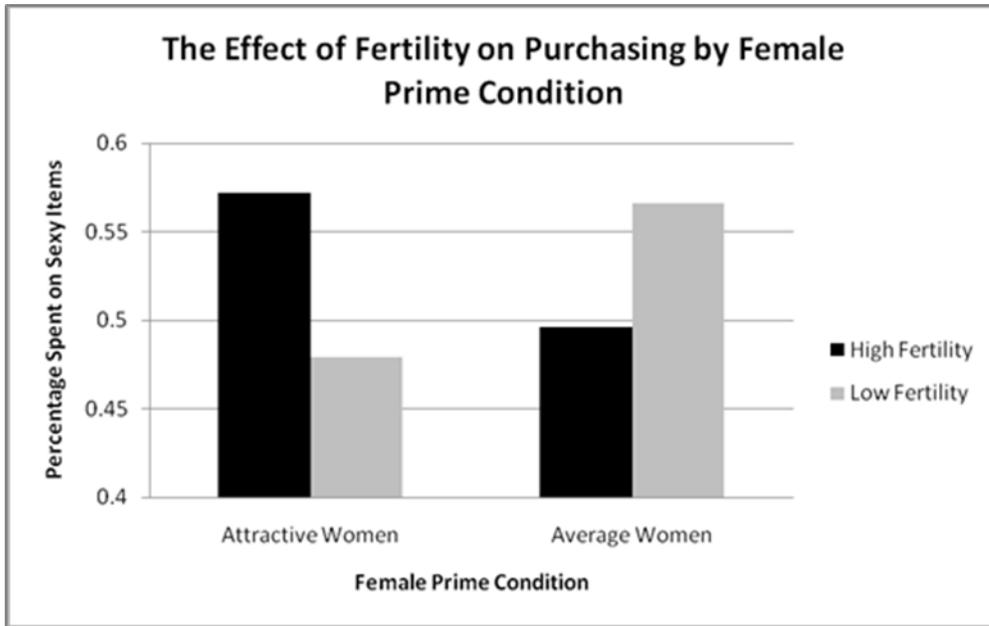
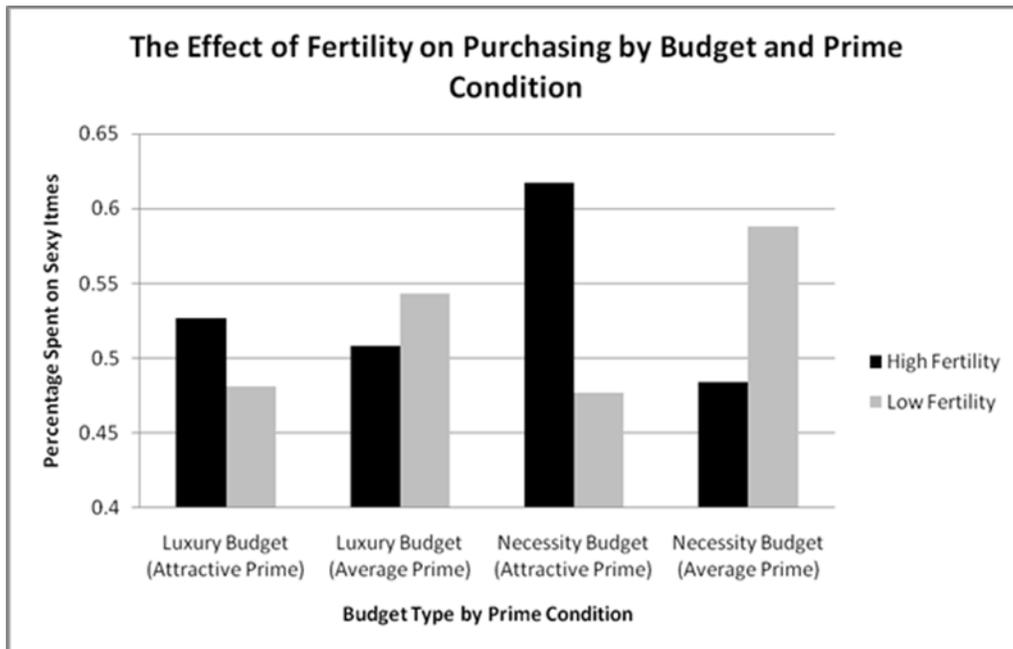


Figure 4. The effect of fertility on purchasing behavior as a function of budget and prime condition.



There was no interaction between the effect of fertility on spending, prime condition, and relationship status, $p=.22$. The influence of attractive same-sex peers on spending patterns did not differ between single and partnered women.

Discussion

Results of Study 2 add an important piece to the puzzle surrounding the function of fertility-induced shifts in choice of dress. Consistent with Prediction 5, it was found that the effect of fertility on women's clothing purchases was most pronounced after viewing and rating photographs of attractive women. Women in the attractive female prime condition were purchasing a greater number of sexy and revealing fashion items at high fertility compared to low fertility. This effect of fertility on clothing purchases was absent after viewing and rating photographs of women of average attractiveness and landscapes. Further, the fertility-induced shift in spending on sexy fashion items in the attractive female prime condition was strongest for low-budget, necessity-based spending. Purchasing sexy and revealing clothing and accessories appears to be a necessity rather than a luxury at high fertility when primed with attractive, same-sex others. Consistent with Prediction 7, the effect of fertility on clothing purchases occurred when competitors were thought to be from one's own university versus one in a different state.

Although results of Study 2 suggest that the effect of fertility on choice of sexy and more revealing fashion items is the function of an increase in women's intrasexual competitiveness at high fertility, I further explore the functional nature of such shifts with the addition of a mating-related prime in Study 3.

STUDY 3: TESTING THE INFLUENCE OF OPPOSITE-SEX OTHERS ON PURCHASING

Previous research on ovulatory shifts in women's social motivations and behaviors has suggested that such shifts (e.g., increases in flirtatiousness and interest in men other than the primary partner) function to enable women to attract and mate with men displaying indicators of high genetic quality when fertility is highest. However, Study 2 found the effect of fertility on choice of sexy fashion items to be strongest after women were primed with attractive same-sex peers. This suggests that ovulatory shifts in women's choice of dress reflect a fertility-induced increase in women's intrasexual competitiveness. That is, women experience increased awareness of intrasexual rivals when their own fertility is highest, motivating them to engage in attractiveness enhancing behaviors in effort to appear more attractive than same-sex peers. However, the influence of a mating-related motivation (i.e., attractive men) on fashion preferences across the ovulatory cycle was not examined.

Study 3 was designed to shed more light on whether the ovulatory shift in dress is the result of an increase in intrasexual competition or if the shift functions to attract a man of high genetic quality when fertile, or, perhaps, serves both ends. To do this, I substituted the intrasexual competition prime (attractive same-sex others) with a mating-related prime (attractive opposite sex others) prior to completion of the shopping task. If the ovulatory shift in dress operates to attract a high-quality partner, then the effect of fertility on the purchase of sexy and revealing fashion items should be strongest when viewing photographs of attractive men and absent (or marginal) when viewing photographs of average looking men and landscapes. If, however, ovulatory shifts in choice of dress reflect an increase in female-female competition, as

Study 2 suggests, then viewing attractive men prior to completing the shopping task should not influence the effect of fertility on preference for sexy and revealing clothing and accessories.

Method

Participants

Participants were 54 female undergraduates at the University of Texas, Austin between the ages of 17 to 38 years ($M = 18.93$; $SD=2.8$). All were normally ovulating and not on hormonal contraceptives. Eighty-eight participants were originally recruited for this study. However, 8 participants failed to complete both testing sessions and 26 participants did not show evidence of a surge in LH. High fertility testing sessions took place, on average, .59 days after a surge in LH ($SD=.98$) and .29 days before day-of-ovulation ($SD=1.03$). On average, low fertility testing sessions took place 3.85 days prior to menses ($SD=3.52$). Thirty-four participants completed high fertility testing first and 20 completed low fertility testing first.

Design and Procedure

The overall design of this study was a 2 (Fertility Session: High vs. Low Fertility) x 2 (Budget: Low vs. High) x 5 (Mating Prime Condition: Attractive Males Local, Attractive Males Distant, Average Males Local, Average Males Distant, Landscapes) mixed-factorial design with differences in the number of sexy fashion items purchased across budgets at high versus low fertility as the dependent variable. The procedure followed that described in Study 2 and the mating-related prime was substituted for the intrasexual competition prime.

Participants were assigned to either (1) view and rate 10 facial photographs of opposite-sex others from the University of Texas, Austin who are high in physical attractiveness; $n=10$ (2) view and rate 10 facial photographs of opposite-sex others from the University of Texas, Austin

who are average in physical attractiveness; $n=13$ (3) view and rate 10 facial photographs of opposite-sex others from the University of Michigan who are high in physical attractiveness; $n=12$ (4) view and rate 10 facial photographs of opposite-sex others from the University of Michigan who are average in physical attractiveness; $n=6$ (5) or view and rate 10 photographs of landscapes prior to the shopping task; $n=11$.

Instructions for the photograph ratings were consistent with those outlined in Study 2. For each photograph of a male face, participants answered the following questions: (1) “compared with most men, how attractive is this man’s face to women?” (anchors: 1 = not at all attractive, 9 = extremely attractive); (2) “compared with most men, how sexy would women say this man is?” (anchors: 1 = not at all sexy, 9 = extremely sexy); and (3) “compared with most men, how friendly would you say this man is?” (anchors: 1 = not at all friendly, 9 = extremely friendly). For the landscape photographs, questions remained as outlined in Study 2.

The male facial photographs were pre-rated for physical attractiveness on a 9-point scale. Three male and 13 female research assistants, blind to the purpose of the research, rated all photographs for physical attractiveness. Mean attractiveness rating for the attractive male photographs was 6.84 ($SD = .929$). Mean attractiveness rating for the average male photographs was 4.049 ($SD = .622$) (attractive - $\alpha=.926$; average - $\alpha=.775$).

Results

The total number of sexy and revealing items purchased from each budget was summed and converted into a percentage score. Differences in sexy and revealing purchases across budgets and fertility were examined using repeated measures ANOVA (GLM; SPSS 15.0) with “session” (high vs. low fertility) and “budget” (low vs. high) as repeated factors. The above base

model for primary analysis included “mating prime condition” (attractive local males, attractive distant males, average local males, average distant males, and landscapes) as a between-subjects factor.

The mating prime did not influence the effect of fertility on purchasing behavior across prime conditions, $p=.16$ (Figure 5). There was no interaction between fertility session, budget, and prime condition, $p=.75$, nor an interaction with relationship status, $p=.46$. As in Study 2, to further investigate the influence of viewing attractive versus average looking men on purchasing behavior, the attractive male conditions ($n=24$) and the average male conditions ($n=19$) were collapsed across university locations. Again, there was no interaction between fertility session and mating prime condition, $p=.66$, nor a 3-way interaction of fertility session, budget, and prime condition, $p=.52$.

Figure 5. The effect of fertility on purchasing as a function of mating prime condition.

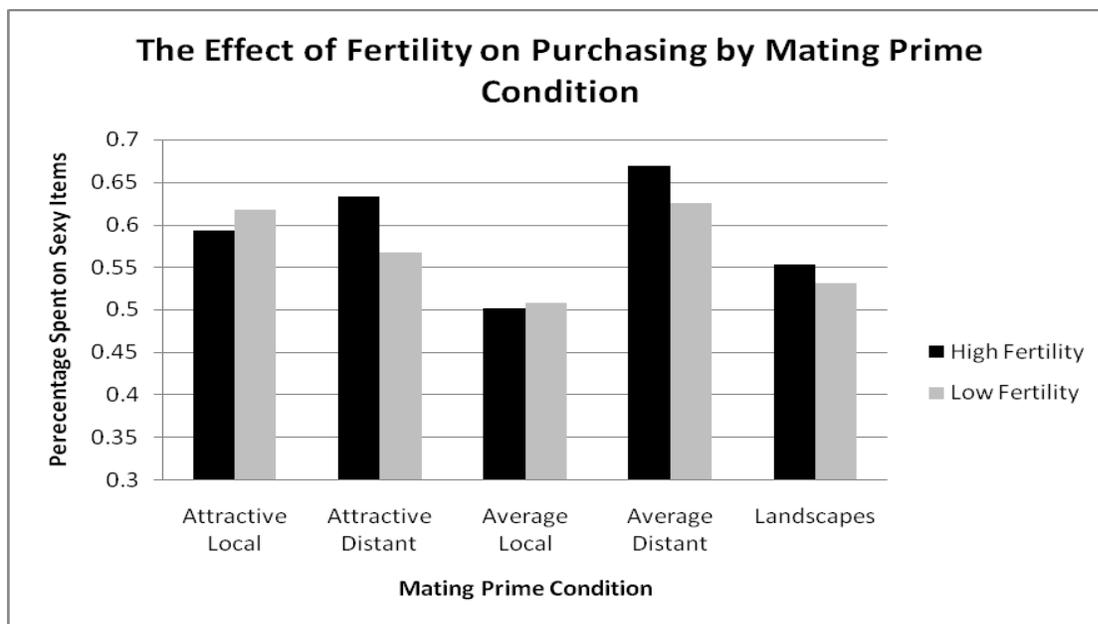


Table 2.

Summary Study 1 – 3: Results of predictions derived from competing hypotheses regarding the function of ovulatory shift in choice of dress.

Independent Variable	Hypothesis		
	By-product	Genetic Benefits/EPC	Intrasexual Competition
Women's relationship status	Single = Partnered	Single < Partnered	Single > Partnered**
Presence of others: same-sex competitors vs. potential mates	Attractive women = Attractive men	Attractive women < Attractive men	Attractive women > Attractive men**

** $p < .01$

Discussion

The results of Study 3 indicate that, consistent with Prediction 7, viewing attractive men, whether local or distant, did not influence woman's purchasing behavior across the cycle. These results directly contrast those of Study 2, in which the viewing of allegedly local women led to greater spending on sexy fashion items. When taken together, the results from Studies 2 and 3 support Predictions 5-7 and the hypothesis that fertility-related shifts in choice of dress more immediately reflect intrasexual competition on appearance, rather than attempts to attract the opposite sex..

More generally, previous research has found that men, but not women, are motivated to conspicuously consume luxury products and discount future earnings to gain immediate monetary rewards after viewing photographs of attractive, opposite sex others (Griskevicius et

al., 2007; Wilson & Daly, 2004). In contrast, results of Studies 2 and 3 suggest that women's fashion-related consumer behavior may be more sensitive to the presence of attractive women than to potential mates. Finally, attractive women in one's local (or in-group) social network appear to elicit strategic shifts in attractiveness-enhancement behaviors as compared to distant (or out-group) attractive women who are unlikely to be encountered on a day-to-day basis.

General Discussion

The initial aim of the current research was to test whether a woman's purchasing behavior changes across the ovulatory cycle and shed light on the possible function of shifts in choice of dress at high fertility. The number of sexy and revealing clothing and accessory items women purchased at high and low fertility was measured using a simulated, online shopping program that tracked women's spending patterns across varying budgets. Although recent work has found that women choose sexier and more fashionable styles of dress near ovulation (Durante, et al., 2008; Haselton et al., 2007), I extended this research by directly examining potential underlying motivations as well as important contingencies to this strategic shift in behavior.

Results from three studies supported 5 out of 8 predictions and marginally supported 2 additional predictions. Study 1 found that when women were closest to ovulation, they spent significantly more on sexy and revealing fashion items. The effect of fertility on spending was stronger for single women than for partnered women and the fertility-based shift in purchasing was most evident when operating from a low, necessity-based budget. In Studies 2 and 3, I examined three competing functions of the strategic shift in choice of dress near ovulation: by-product (no real function), extra pair genetic benefits, and intrasexual competition. Results

indicated that the effect of fertility on choice of dress was significantly more pronounced when participants were primed with photographs of attractive women (Study 2) but not when primed with photographs of attractive men (Study 3), thereby supporting the overall hypothesis that processes of intrasexual competition may underlie ovulatory shifts in clothing preferences (see Table 2). These studies are the first to empirically investigate shifts in women's consumer behavior across the ovulatory cycle and the first to directly test the influence of intrasexual rivals on women's attractiveness-enhancing behavior.

The Function of Strategic Shifts in Choice of Dress

While partnered women tended to value sexy clothing and accessories as luxuries, single women tended to purchase sexy clothing and accessories as a low-budget necessity. This finding is in line with previous research that found the fertility-induced shift in choice of dress to be strongest for single women (Durante et al., 2008), despite a larger body of work suggesting that cycle shifts in sexually related behaviors are stronger for mated women (e.g., Havlick et al., 2005; Little et al., 2002; Pillsworth et al., 2004). Single women are more active on the mating market than women already in committed relationships and, thus, are solving a different set of adaptive problems (e.g., outcompeting other women on appearance, ultimately to attract the highest-quality, investing partner available) and these problems are likely most relevant when fertility within the menstrual cycle is highest. Thus, our findings are consistent with the proposal that the fertility-induced shift in dress is a reflection of an increase in intrasexual competition rather than behavior designed for partnered women to attract an extra-pair partner near ovulation.

It has been argued that the shift in preference for sexy and revealing clothing at high fertility is a by-product of increases in steroid hormone levels nearest to ovulation (Thornhill & Gangestad, 2008). Scholars have reasoned that a functional role underlying women's motivation

to “advertise” their fertility status is difficult to reconcile. Distinct from many other species, the fertile period of the human ovulatory cycle is mostly concealed (e.g., Burt, 1992). Concealed ovulation and women’s continuous sexual receptivity across the cycle may have evolved to extend male investment and sexual interest throughout the cycle (Benshoof & Thornhill, 1979; Thornhill, 2007) and promote the socially monogamous bond between a man and a woman (Alexander & Noonan, 1979). Concealed ovulation may also function to enable women to retain control over mate choice. For example, by making it difficult for men to keep track of women’s fertile window, women are in a better position to mate and have offspring with a man other than the current social partner (Thornhill, 2007). As such, advertising fertility status via sexy and revealing clothing would be costly. Revealing too much skin may attract unwanted attention from undesirable men or lead to reputational damage for appearing promiscuous. However, if the cost of such behavior is high (e.g., diminishing women’s ability to retain control over mate choice) and the potential payoff negligible (e.g., low probability of attracting a higher quality mate) selection pressure would have likely dampened the influence of ovulatory hormones on motivation to dress provocatively. Although clothing and other fashion accessories are relatively modern conveniences, particularly in the context of deep evolutionary time, the motivation that underlies fertility-induced shifts in dress – appearing more attractive – could nonetheless be deep-seated within female mating psychology and modern day fashion is simply a new tool employed to reach a desired end. The current research suggests that the cycle shift in choice of dress is a context-specific adaptation to increases in fertility, as opposed to a trivial hormone-mediated by-product, that increased women's ability to attract a high quality mate.

Unlike previous research, our work directly tested the underlying function of the ovulatory shift in choice of dress by activating the salience of specific goal-states (e.g.,

Chartrand & Bargh, 2002). Specifically, I examined the influence of both intrasexual rivals (i.e., attractive local women) and potential romantic partners (i.e., attractive local men) on women's motivation to purchase sexy and revealing fashion items at high fertility. Viewing attractive women thought to be students at the participants' university significantly moderated the effect of fertility on the purchase of sexy and revealing clothing and accessories. Across five prime conditions, women who saw and rated photographs of attractive, local women prior to the shopping task showed a stronger fertility-induced increase in preference for sexy fashion and accessories. Viewing women of average attractiveness, women who were allegedly from a distant university, or landscapes did not influence the effect of fertility on clothing preference. Further, results of Study 3 found that exposure to attractive men also did not influence women's spending on sexy and revealing fashion items.

Taken together, results suggest that the ovulatory shift in choice of dress reflects an increase in female-female competition and is not a hormone-mediated by-product, behavior designed to attract an extra-pair partner (when mated), or behavior specifically designed to attract a man of high genetic quality. That women were motivated to enhance their attractiveness by same-sex competitors and not by the opposite sex lends strong support to the proposition that women become more intrasexually competitive when fertility within the cycle is highest (e.g., Durante et al., 2008; Fisher, 2004; Lucas et al., 2007). Clothing and other fashion accessories (e.g., high heel shoes) can enhance the perceived reproductive quality of a woman. These fashion items can camouflage asymmetries or correct the appearance of features that men find most attractive (e.g., push-up bra improving the appearance of the bust line) or accentuate a woman's best features (e.g., a form fitting dress displaying a woman's waist-to-hip ratio). Our findings

suggest that women use clothing and other fashion accessories to appear more attractive than other women when their own fertility is highest.

Implications for Women's Consumer Motivations

Previous research has employed budget allocation methods to uncover context-dependent shifts in human preferences that remain elusive when using traditional self-report methodology (Li et al., 2002; Li & Kenrick, 2006). When options are constrained, individuals must prioritize what items, characteristics, or outcomes are most critical given current environmental conditions or the salience of specific goals. Because physical attractiveness is a cue to a woman's reproductive health (Durante & Li, 2009; Symons, 1979; Williams, 1975), men's evolved mating psychology places a high priority on a woman's facial and body attractiveness, particularly for long-term partners. Indeed, when selecting a long-term mate, men desire a minimal level of physical attractiveness in a romantic partner before being concerned about other characteristics (Li et al., 2002). In other words, a woman's ability to produce offspring (as denoted by physical attractiveness) is a necessity when mating options are constrained, whereas other characteristics (e.g., intelligence, friendliness, creativity), although important, are considered luxuries in that they were selected when men were allowed to add additional characteristics to their preferred romantic partners.

In the current research, when women were at high fertility, they purchased significantly more sexy items than when they were at low fertility. Further, for single women and when women were primed with attractive intrasexual rivals, the favoring of sexy items at high versus low fertility was seen at the low budget, which suggests that competing on appearance may be especially critical for single women and when attractive peers are present.

Limitations and Future Directions

An important limitation of the current research is that the shopping program used to track shifts in purchasing behavior contained only fashion-related items. All of the items were related to physical appearance (e.g., clothes, shoes); thus, it is possible that the demonstrated effect of increased willingness to spend on sexy items may actually result from a more general desire to conspicuously consume at high fertility or when primed with intrasexual rivals. Future research is needed to demonstrate that women purchase products related to attractiveness enhancement (e.g., sexy clothes) during periods of high fertility, but do not purchase other products or services not related to attractiveness (e.g., electronics or vacations) to rule out this alternative hypothesis.

Future research into fertility-induced increases in intrasexual competition can also benefit from a deeper investigation of women's current mating motivations. For example, because men are less selective when choosing a short-term partner, women may be less competitive when they are most interested in securing a short-term sexual partner as opposed to when they are currently expending effort to securing a long-term partner. In addition, a third testing session at the onset of women's menstrual periods may add greater depth to the effect of fertility on women's clothing preferences. Near menses, ovarian hormones are at their lowest levels and, perhaps, the magnitude of the difference in attractiveness-enhancement motivations from high fertility points would be even greater. Finally, although not significant, women in relationships were showing a greater increase in the purchase of sexy fashion at low fertility. Previous research has found that, near ovulation, women's primary partners are more protective and participate in more mate guarding behavior (Pillsworth & Haselton, 2006). It is possible that the mate retention tactics of the male partners near ovulation may be dampening or reversing the effect of fertility on

partnered women's clothing choice. Future research can benefit for obtaining reports of primary partner mate-guarding behaviors across the cycle to determine if there is any moderating effect.

Although lingerie and stiletto pumps are modern-day clothing options, I have hypothesized underlying mechanisms that are evolutionarily adaptive. Similar to men preferring luxury vehicles when primed with mating goals (Griskevicius et al., 2007), female-competition mechanisms may result in evolutionarily novel behaviors; however, such behaviors may still serve to signal the same adaptive cues as they would have in ancestral times. Nevertheless, hypotheses of adaptive mechanisms should also be investigated in non-modern societies (Marlowe, 2005). For instance, Burmese women of the Padaung tribe ornament themselves by wearing heavy coils around their necks, calves, and wrists (Etcoff, 1999). If such behaviors also increase according to fertility status and the presence of same-sex competitors, then the proposed intrasexual competition mechanisms could be viewed as more evolutionarily valid.

Conclusion

In summary, these studies are the first to test shifts in women's consumer behavior across the ovulatory cycle and the first to directly test the influence of intrasexual rivals on women's attractiveness-enhancing behavior. In doing so, a key predictor variable – the ovulatory cycle – has been identified, opening the field for future investigations that may further explain variation in women's social competition.

Chapter 2 – The Ovulatory Shift in Risk-taking Behavior

Economists and social scientists have long been interested in how humans make decisions and judgments under risk (e.g., Kahneman & Tversky, 1979). Specifically, researchers have consistently found that human decision-making does not always follow the usual axioms of economic theory (e.g., expected utility; risk aversion; Bayesian updating; rational expectations) but instead can follow a seemingly less rational path (De Bont & Thaler, 1995). Pioneering work by Kahneman and Tversky (1979) drew attention to the human tendency to be less willing to gamble with profits than with losses. Much of our decision-making is influenced by how a particular problem is framed. Specifically, when the outcome is viewed as a gain, decision-makers tend to be risk-averse. On the other hand, when the outcome is defined as a loss, decision-makers will be risk-seeking.

Choice under constraint

Not surprisingly, emotions and memory play an important role in decision-making heuristics and biases (e.g., Mather, Shafir, & Johnson, 2000; Wirtz, Kruger, Scollon, & Diener, 2003; Muramatsu & Hanoch, 2005). It has been established that human decision-making takes place with only a limited set of knowledge about the outcome of certain options and, therefore, individuals must optimize under constraints. Emotions function as a cognitive guide, exerting systematic influence on thinking and choice.

When making decisions, our environment plays an important role in regulating the emotions that drive our decision rules (Todd & Gigerenzer, 1999). Resource availability, sex ratio, perceived mate value and mating opportunities likely guide our behavior and thus, the decisions we make. Further, we do not have time to be looking for an apartment, mate, food, or

job for the rest of our lives, so our search ends when we encounter one cue that discriminates between two options. When calculating our future behavior, we often look to our social environment and the actions of those around us to determine a course of action.

Positional concerns

Instead of seeking to maximize personal utility, many decisions are based on the preferences and resource holdings of our peers (Frank, 1999). Obtaining a high relative standing compared to others in one's environment likely conferred important fitness-enhancing benefits throughout human evolutionary history. For example, having above average physical attractiveness and having greater access to resources than our peers can help us secure high-quality mates. Recent research has found that both men and women consistently prefer having a positional advantage over their same-sex peers in terms of income and women are significantly more concerned with their position with regard to their physical attractiveness (Solnick & Hemenway, 1998; Hill & Buss, 2006). In other words, having less absolute income or less absolute attractiveness can be preferred as long as income and attractiveness level are higher than one's same-sex peers.

Successfully competing with our rivals involves consistent monitoring of our position relative to those around us. Those individuals who lacked concern for how their peers were faring in terms of acquiring resources were more susceptible to steep downturns in their reproductive success. A decision to dismiss a potential rival carries a higher cost than does monitoring the actions of our rivals and adjusting our behavior accordingly.

Risk-taking and intrasexual competition

Evolutionary social psychological models predict that human motivations and behaviors are driven by competition for limited reproductive resources (i.e., mates, wealth, and status).

Most social species have evolved motivational systems that function to successfully navigate dominance and status interactions (Archer, 1988). The evolved architecture of these systems track information about relative position and/or status and calculate the costs and benefits of engaging in risky behavior to acquire access to resources – particularly those resources that are highly desired by the opposite sex.

The psychological mechanisms that regulate intrasexual competition should be present in both men and women but the domains of competition are likely quite different. Because reproduction is so energetically costly for women, those who mate with and secure investment from a resourceful man are more likely to see their offspring not only survive, but thrive (Geary, 2000). Therefore, women desire men with high status and access to valuable resources that confer a greater degree of reproductive success (e.g., money, food, shelter, protection; Buss, 1989; Li et al., 2002). Accordingly, men are more likely to incur risk to acquire status or resources, especially when competing with men of similar status rankings (Ermer, Cosmides, & Tooby, 2008). Women, on the other hand, compete with one another in terms of their physical attractiveness – a feature highly desired by men when selecting a long-term mate (Campbell, 2004). As such, it is possible that women will be most likely to incur risk to appear more attractive than same-sex peers. Further, because material resources (i.e., direct benefits) are a greater necessity for successful reproduction than are genetic resources (i.e., indirect benefits), selection pressures should be stronger for evolved female mate preferences for those male features or traits that confer direct benefits (i.e., ability to acquire resources; Cameron, Day, & Rowe, 2003). Accordingly, women should also be more willing to incur a risk to secure a mate who provides high-quality resources.

Risk-taking and fertility

Recent fMRI research has found that women experience an increase in desire for immediate rewards near ovulation (Dreher et al., 2007). Further, research suggests that women may become more intrasexually competitive near ovulation. When asked to rate other women's facial attractiveness, women's ratings were lower mid-cycle when estradiol levels were high (Fisher, 2004). Another study of female competitiveness found that women closest to expected day of ovulation were less likely to share a monetary award and more likely to reject a low offer to share in a monetary stake with another woman (Lucas et al., 2007). The authors proposed that near ovulation, women may be prone to compete for material resources. For women, the reproductive stakes are highest at peak fertility. If a woman's ultimate goal is to portray herself as desirable as possible to the opposite sex compared to others who are attempting to do the same (Buss & Dedden, 1990), actions taken to achieve this goal may be heightened when conception is most likely. As such, it is hypothesized that a woman's willingness to incur a risk to gain position over her same-sex peers will increase when conception probability is highest. Specifically, when they are most fertile, women should be most willing to incur a risk to appear more attractive than same-sex peers and to secure a mate with access to quality material resources.

PREDICTIONS DERIVED FOR THE OVULATORY SHIFT IN RISK-TAKING HYPOTHESIS

Prediction 1: Near ovulation, women will be more likely to incur a health risk to appear more attractive than their same-sex peers. Men place great importance on physical attractiveness when it comes to selecting a mate, especially a mate in whom they will invest time and resources

(Buss & Schmitt, 1993; Li et al., 2002). Thus, women compete with one another in terms of their appearance (Cashdan, 1998).

When evaluating same-sex peers, women tend to pay particular attention to the waist, hips, and legs of their perceived rivals (Dijkstra & Buunk, 2001). Throughout history, women have altered perceived body abnormalities in an attempt to achieve a fuller bust, smaller waist or tighter thighs and buttocks (Campbell, 2004). The American Society of Plastic Surgeons reported that, of the 11.7 million cosmetic surgical and non-surgical procedures performed in the United States in 2007, 10.6 million were performed on women (Report of Procedural Statistics, 2008). As medical innovations and public acceptance increase, this number is likely to rise significantly. In addition, women often go to extreme lengths to maintain a desired body weight. It has been proposed that anorexia and bulimia may represent a dysfunctional form of female competition (Mealey, 2000) and that female intrasexual competition for mates is the driving factor behind women's perfectionism, body dissatisfaction, drive for thinness and, thus, both bulimia and anorexia (Faer, Hendriks, Abed & Figueredo, 2005).

Near ovulation, when reproductive concerns are most relevant, a woman's desire to outcompete her rivals may be even stronger than usual. Therefore, I predicted that women will be willing to incur a health risk to appear more attractive (in terms of both face and body attractiveness) than their same-sex peers, and the likelihood of incurring this risk will increase nearest to ovulation.

Prediction 2: Women will be more likely to incur a monetary risk to appear more attractive than her same-sex peers near ovulation. The likelihood of incurring a monetary risk will be higher than that of incurring a risk to health or relationship. Following from Prediction 1, if women are willing to incur a risk to their future health and well-being to appear more

attractive than their same-sex peers, they may be more likely to discount the future and incur a monetary debt to achieve a similar goal. The future costs associated with spending money one does not have, particularly when a line of credit is extended, may be viewed as lower than the costs associated with a risk to health or relationship.

Credit card debt has nearly tripled in the last two decades (Bennett, J., *Newsweek*, Aug. 16, 2006). Among college-age credit card users, it was found that women use credit cards to purchase clothing whereas males use their credit to purchase electronics, entertainment, and food (Turner, 2000). These findings suggest that women are discounting the future by incurring a debt to enhance their appearance (via clothing and accessories) and men are discounting the future by incurring a debt to spend the evenings out on the town and purchase dinners and drinks. Presumably these purchasing behaviors are undertaken with the ultimate goal of attracting, securing, and maintaining a mate. As mentioned earlier, a recent study found that, when presented with photographs of attractive females, men – but not women – tend to discount the future by accepting a smaller sum of money immediately rather than waiting to receive a larger sum (Daly & Wilson, 2004). If men are willing to discount the future in response to women who are attractive, then conversely, women might be willing to discount the future in order to out-compete women on what men are looking for -- attractiveness. Specifically, I predicted that women may be willing to incur a monetary debt to purchase expensive clothing, accessories, make-up, and other grooming products/services to appear more attractive than their same-sex peers when anticipating an upcoming social event. This purchasing behavior will be especially strong at a time when fertility is highest – near ovulation – and will occur at a higher rate than a risk to health or relationship.

Prediction 3: Near ovulation, women will discount the future of a romantic relationship to secure a romantic partner with a greater ability to acquire resources than partners of her same-sex peers. Women place a high premium on a man's ability to acquire resources (Li et al., 2002). Recently, it was found that men discount the future and accept low but immediate monetary rewards, rather than accepting a higher monetary award at a later date, specifically in response to a mating-related prime. If men discount the future to gain resources that help attract a high-quality mate, women should discount the future for access to rich, high status men.

Natural selection has likely shaped women's mating psychology to be sensitive to changes in fertility status. It is plausible that the physiological mechanisms involved in facilitating a fertile menstrual cycle may be linked to cognitive mechanisms adjusting for the relative resource acquisition potential of men in the local environment. Therefore, I predicted that when conception probability is highest (near ovulation), women will be more willing to accept a high probability of the relationship's eventual demise in exchange for the immediate rewards of a mate who can provide a strong income, expensive car, nice dinners, and other high visibility items.

Prediction 4: Near ovulation, relationship status should impact a woman's willingness to take risks to gain position over her same-sex peers in terms of physical attractiveness and securing a mate who can provide quality resources. Women who are *not* already in a committed relationship are solving a very different adaptive problem than women in relationships – attracting a high-quality partner. As such, single women are likely more competitive on the mating market and thus, more likely to take risks to compete with other women on attractiveness. This difference in competitive risk taking between single and partnered women should be especially high nearest ovulation, when fertility is highest.

Women who have already secured a partner, on the other hand, may be more interested in signaling the commitment level of their current partners through display of status-signaling consumer items. Unlike single women, women in relationships face the adaptive problem of mate poaching (e.g., losing their mate to a same-sex rival). Thus, women in relationships may be more likely to take a risk to garner resources that signal status. Many women are very conscious of brands and “labels” when purchasing consumer products (particularly fashion items). Most men, however, know very little about the differences between specific female fashion labels. Thus, carrying a designer handbag likely does not increase a woman’s ability to attract a mate. Without necessarily being consciously aware of their motives, modern women may use designer consumer goods to signal status to other women, perhaps as a way to convey information about her partner’s level of commitment to the relationship and effectively deter possible interlopers.

Research has found that men conspicuously consume products that signal status (e.g., cars, vacations, watches) when primed with photographs of attractive women or other mating-related motivation (Griskevicius et al., 2007). This suggests that women desire ownership of these products and services in their mates. Thus, it is predicted that women in relationships may be more likely to incur a risk, and discount the future, to secure high-end consumer items that are provided by their romantic partners.

Prediction 5: Women of lower self-perceived attractiveness will take greater risks to gain position relative to same-sex rivals in terms of both physical attractiveness and acquiring a mate who can provide significant (if temporary) resources. In addition, the willingness to accept a risk will be most pronounced near ovulation. Just as an ovulatory increase in preference for clothing sexiness may have the biggest return for those of low attractiveness, so too will risks incurred to compete with and gain position on same-sex peers. Because of the potential costs associated with

a risky intrasexual competition strategy, the marginal benefit may be too small for women who are already able to compete well (i.e., women high in attractiveness). Thus, it is predicted that a strong ovulatory shift in favor of incurring a risk to out-compete rivals should be strongest for women of low to average physical attractiveness.

Prediction 6: The ovulatory shift in risk-taking to gain positional advantage over same-sex peers will increase after viewing and rating photographs of attractive, same-sex others.

Women may be more inclined to take greater risks when primed with photographs of attractive, same-sex rivals as opposed to rivals of average attractiveness or photographs of men. Thus, I predicted that women will respond strongly to images of attractive females who may be viewed as rivals and alter their risk-taking behavior at high fertility. More generally, risks incurred to gain position relative to rivals should increase after exposure to highly attractive same-sex rivals.

STUDY 4: TEST OF THE OVULATORY SHIFT IN RISK-TAKING

In this study, I test the predictions outlined above with a survey paradigm modeled after methodology used in prior behavioral and economic decision-making research (Kahneman & Tversky, 1979; Frank, 1985; Solnick & Hemenway, 1998; Hill & Buss, 2006). However, instead of simply framing the questions as options involving a positional versus non-positional advantage (e.g., having more income relative to same-sex peers versus having more absolute income) or options involving a risky choice (e.g., 50% chance to win \$1,000 versus \$450 for sure), I combine the two paradigms to examine the extent to which women will incur a risk to gain relative position over same-sex others.

Method

Participants

Participants were 109 female undergraduates at the University of Texas, Austin aged 17 to 38 years ($M=18.84$, $SD=2.24$). All women were normally ovulating (not using the pill or other hormonal contraceptive). Participants were compensated with research credit for a psychology course or with \$30. An effort was made to complete high fertility testing on the day of the participant's LH surge or the day of ovulation. On average, high fertility testing took place .59 days after a positive test indicated a surge in LH ($SD=.92$). Low fertility sessions were scheduled seven days or more after the LH surge or at least three days before onset of their menstrual periods.

Procedure

Participants were prescreened as outlined in Study 1. The testing procedure ran as indicated in Study 1 and included the intrasexual competition and mating primes described in Study 2 and Study 3.

At the start of testing, participants viewed and rated photographs in one of eight conditions corresponding to a 2 Target Sex (female, male) x 2 Proximity (local, distant) x 2 Physical Attractiveness (high, average) design plus a control condition. Thus, participants were assigned to one of the 9 prime conditions: (1) view and rate 10 facial photographs of same-sex others from the University of Texas, Austin who are high in physical attractiveness, $n=11$, (2) view and rate 10 facial photographs of same-sex others from the University of Texas, Austin who are average in physical attractiveness, $n=13$, (3) view and rate 10 facial photographs of same-sex others from the University of Michigan who are high in physical attractiveness, $n=9$, (4) view and rate 10 facial photographs of same-sex others from the University of Michigan who

are average in physical attractiveness, $n=13$, (5) view and rate 10 facial photographs of opposite-sex others from the University of Texas, Austin who are high in physical attractiveness; $n=10$, (6) view and rate 10 facial photographs of opposite-sex others from the University of Texas, Austin who are average in physical attractiveness; $n=6$, (7) view and rate 10 facial photographs of opposite-sex others from the University of Michigan who are high in physical attractiveness; $n=12$, (8) view and rate 10 facial photographs of opposite-sex others from the University of Michigan who are average in physical attractiveness; $n=9$ (9) or view and rate 10 photographs of landscapes prior to the shopping task; $n=26$. Instructions for the photograph ratings were consistent with those outlined in Study 2 (intrasexual prime) and Study 3 (same-sex prime).

Immediately following the photograph rating, participants completed the shopping program detailed in Study 1 and completed a 20-item risk-taking survey (see Appendix B). Survey items were randomized in two different forms. Participants received a different randomization of the survey items at high and low fertility. For each survey item, participants were shown two options. One option contained a positional advantage relative to same-sex peers accompanied by a significant health, monetary or relationship risk. The other option contained a positional disadvantage accompanied by a low risk to health, budget, or relationship or accompanied by no risk at all. Participants were given the following instructions:

In this task you will be presented with a series of questions. Each question contains two choices (either Choice A or Choice B) to represent a particular action or situation.

Please select the choice that best fits the action you would take (or the situation you would prefer) given the two options. Keep in mind that there are NO "correct" answers.

Sample question:

1. Choice A: You are a 6 in body attractiveness and your same-sex peers are an 8. You have a 15% chance of gaining 75 lbs. in 10 years.
2. Choice B: Due to a revolutionary new diet pill, you are an 8 in body attractiveness and your same-sex peers are a 6. You have an 80% chance of gaining 75 lbs. in 10 years.

Immediately following, participants completed a short survey designed to measure *individual* as well as *family* socio-economic status and desire for long-term and short-term mates as well as effort allocated to acquiring a new mate (see Appendix C). Socio-economic status may influence a woman's willingness to spend money on items that augment physical attractiveness and a woman's competitiveness on the mating market may influence the likelihood she will take a risk to appear more attractive. Finally, participants completed the biographical measures outlined in Studies 1 through 3.

Results

Data Coding and Analyses

To examine differences in risk-taking across the ovulatory cycle, the risk-taking and positional bias items were coded as dichotomous variables. Selection of the risky, positional *advantage* option was coded as a 1 and selection of the non-risky, positional *disadvantage* option was coded as a 0. To examine the ovulatory shift in willingness to incur a risk to gain position on same-sex rivals, the data were transposed as follows: (1) a risky-shift at low fertility (i.e., selection of the risky option at low fertility but not high fertility) was coded as **-1**, (2) a risky-shift at high fertility (i.e., selection of the risky option at high fertility but not low fertility) was coded as a **1**, and (3) the absence of a risky-shift (i.e., no change in risk taking across low and

high fertility) was coded as a 0. One-sample T-tests were used to determine whether or not women were more likely to take a risk to gain position over rivals at high compared to low fertility by testing for a mean significantly greater than zero. One-way analysis of variance was used to examine the influence of relationship status.

Main Effects: Ovulatory Shift in Risk-Taking

Women were significantly more likely to accept a high risk of partner infidelity (80% likelihood) at high fertility compared to low fertility ($M=.092$, $SD=.40$) in order to receive a Prada handbag (high-end designer, higher cost) from their romantic partners while their same-sex peers received Banana Republic handbags (non-designer, lower cost) from their romantic partners, $t(108)=2.41$, $p=.018$.

Women were also more likely to accept a high risk of partner infidelity (75% likelihood) at high fertility compared to low fertility ($M=.064$, $SD=.28$) to receive a 4kt diamond ring from Tiffany's (larger diamond, designer, higher cost) while their same-sex peers received 1kt rings from Macy's (smaller diamond, lower cost), $t(108)=2.38$, $p=.019$.

Women were marginally more likely to accept a high risk of career failure to obtain a higher salary (\$80K/year vs. \$50K/year) than same-sex peers at high fertility compared to low fertility ($M=.055$, $SD=.43$), $t(108)=1.35$, $p=.18$, and marginally more likely to accept a high risk of partner infidelity to secure a romantic partner who is more attractive than the partners of same-sex peers at high fertility compared to low fertility ($M=.046$, $SD=.34$), $t(108)=1.39$, $p=.16$.

Risk-taking did not differ across fertility sessions for all other risk items. Out of 20 items, 11 means were above zero, indicating an increase in willingness to take a risk at high-fertility. However, of the 20 items, only two were statistically significant (Table 3).

Table 3. Summary of results: Test of the fertility-induced shift in risk-taking. (Note: $*p < .05$; **bold** indicates fertility-induced shift in risk-taking.)

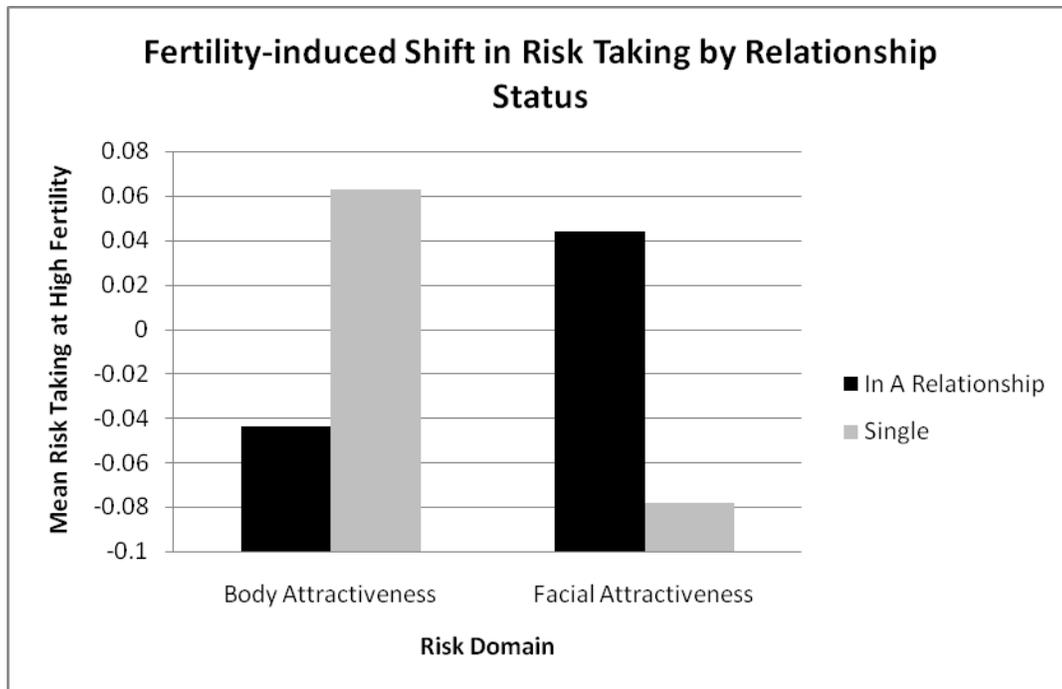
Variable	Mean
Partner Car	-.037
Your Facial Attractiveness	-.028
IQ	-.037
Partner Buy Handbag	.092*
Your Income	.055
Partner Attractiveness	.046
Tanning	.000
Partner Income	-.018
Partner Vacation	.018
Your Body Attractiveness	.018
Partner Ring	.064*
Lie About Your Income	.028
Lie About Your Job	.028
Lie About Your Weight	.018
Buy Outfit	.019
Buy Make-up	.000
Buy Tanning	-.037
Buy Shoes	-.018
Buy Hair Styling	.046
Buy Bra	-.009

Ovulatory Shift in Risk-Taking and Relationship Status

As predicted, single women ($n=64$) were significantly more likely ($M=.063$, $SD=.24$) than women in relationships ($n=45$; $M=-.044$, $SD=.30$) to take diet pills and accept a high risk of gaining a significant amount of weight (75lbs.) in 10 years at high compared to low fertility in order to be currently higher in *body* attractiveness than their same-sex peers, $F(1, 107)=4.22$, $p=.042$.

However, contrary to predictions, women in relationships ($M=.044$, $SD=.30$) were marginally more likely than single women ($M=-.078$, $SD=.41$) to have cosmetic surgery and accept an increased probability of early aging at high compared to low fertility to currently obtain higher *facial* attractiveness than their same-sex peers, $F(1, 107)=2.90$, $p=.09$. See Figure 6.

Figure 6. The effect of fertility on risk taking to appear more attractive as a function of relationship status.



Relationship status did not significantly influence the effect of fertility on risk-taking across the remaining 18 items.

Risk-Taking by Domain

To further test the effect of fertility on women’s risk-taking behavior, the risk items were grouped across three domains: 1) *health* related risks to appear more attractive than same-sex peers, 2) *monetary* related risks to appear more attractive than same-sex peers, and 3) *relationship* related risks to receive more partner resources than same-sex peers. The raw data (0=positional disadvantage/low risk; 1=positional advantage/high risk) were summed as follows: Health Risk to Increase Attractiveness (sum: facial attractiveness, tanning, and body attractiveness), Monetary Risk to Increase Attractiveness (sum: buy dress, buy make-up, buy tanning, buy shoes, buy hair styling/spa services, buy bra), and Relationship Risk to Garner Resources (sum: partner car, partner handbag, partner income, partner vacation, partner ring).

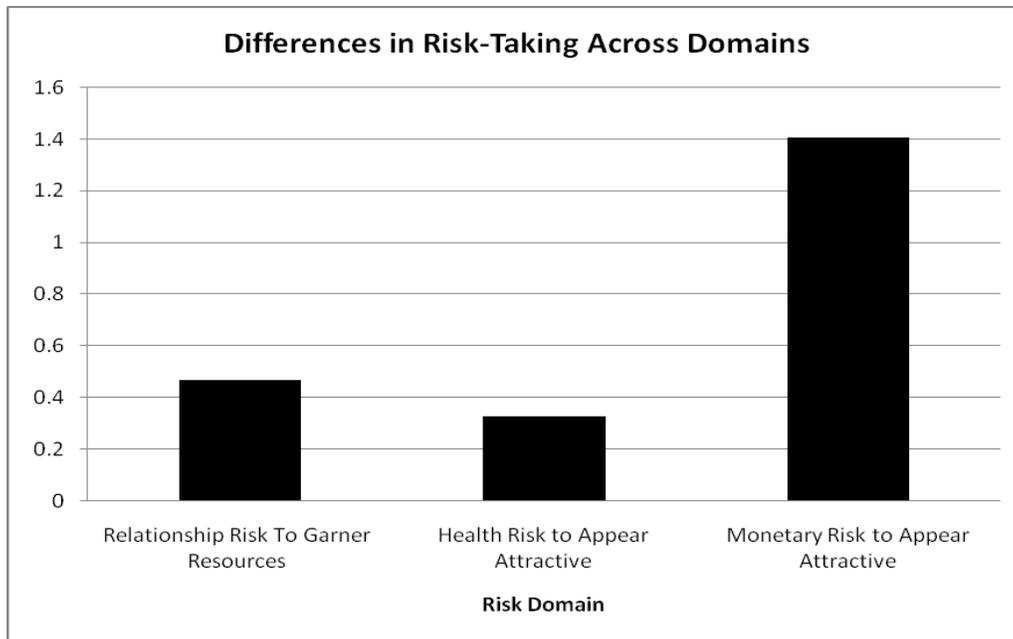
First, differences between high and low-fertility testing sessions were examined

using paired samples T-tests. Second, a 2 (Session: high vs. low fertility) x 3 (Domain: health risk to increase attractiveness vs. monetary risk to increase attractiveness vs. relationship risk to garner resources) repeated measures analysis of variance (ANOVA) was used to probe fertility-induced risk-taking across domains. Relationship status (in a relationship vs. single) and stimuli condition (photographs of attractive vs. average men/women vs. landscapes) were entered into the ANOVA model as between-subject factors and self-perceived attractiveness was entered as a continuous covariate.

Ovulatory Effects on Risk-Taking by Domain

Women were more likely to accept a greater risk of relationship demise to obtain access to higher quality resources (as allocated by their romantic partner) than same-sex peers at high fertility ($M=.54$, $SD=.93$) compared to low fertility ($M=.39$, $SD=.81$), $t(108)=1.94$, $p=.05$. There were no differences across fertility sessions in women's willingness to take *health* or *monetary* risks to appear more attractive than same-sex peers.

The repeated measures ANOVA revealed a significant main effect for risk domain. Women were more likely to incur a *monetary* risk to appear more attractive than same-sex peers, $F(2, 107)=43.52$, $p<.001$, than to incur a *health* risk to appear more attractive or a risk to relationship to garner partner resources. (Figure 7). A marginal fertility session x risk domain interaction, $F(2, 107)=2.37$, $p=.09$, indicated an increased willingness to accept a risk to garner resources at high fertility. There was no main effect of fertility on risk-taking across domains. Figure 7. Differences in risk-taking by domain.



The Influence of Relationship Status on the Ovulatory Shift in Risk-Taking by Domain

There was a fertility session x risk domain x relationship status interaction, $F(2, 104)=3.04, p=.05$. Single women were more likely to accept a risk to future relationship demise at high compared to low fertility in order to obtain higher quality resources from their romantic partners than those obtained by same-sex peers but the simple effect did not reach conventional significance, $F(1, 105)=3.17, p=.078$. See Figures 8 & 9.

Figure 8. The effect of fertility on risk across domains for single women.

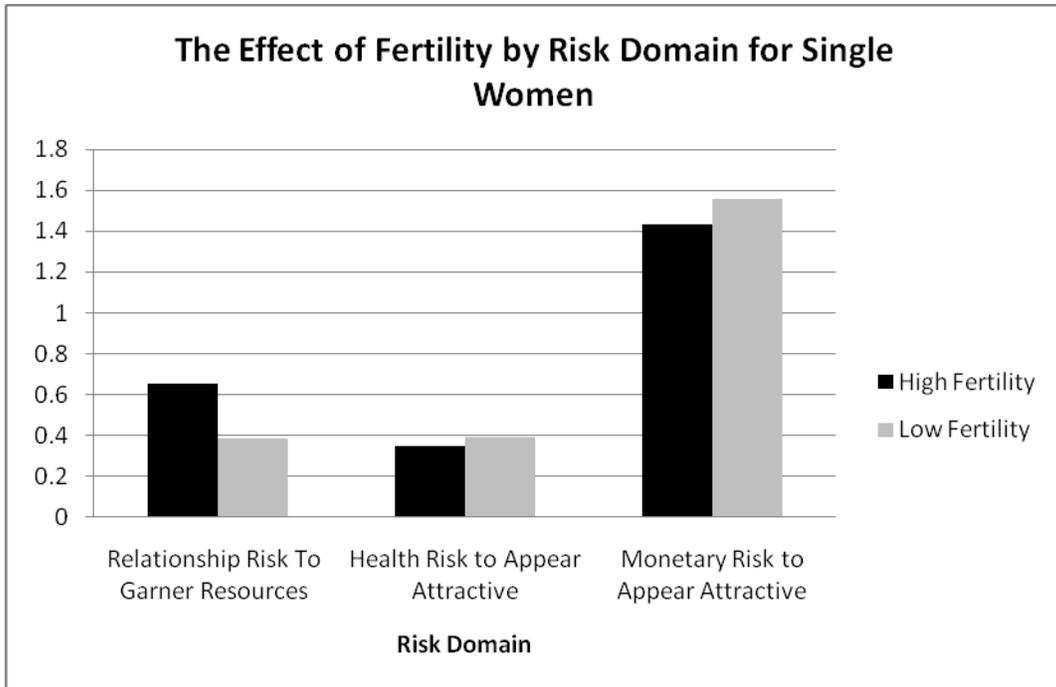
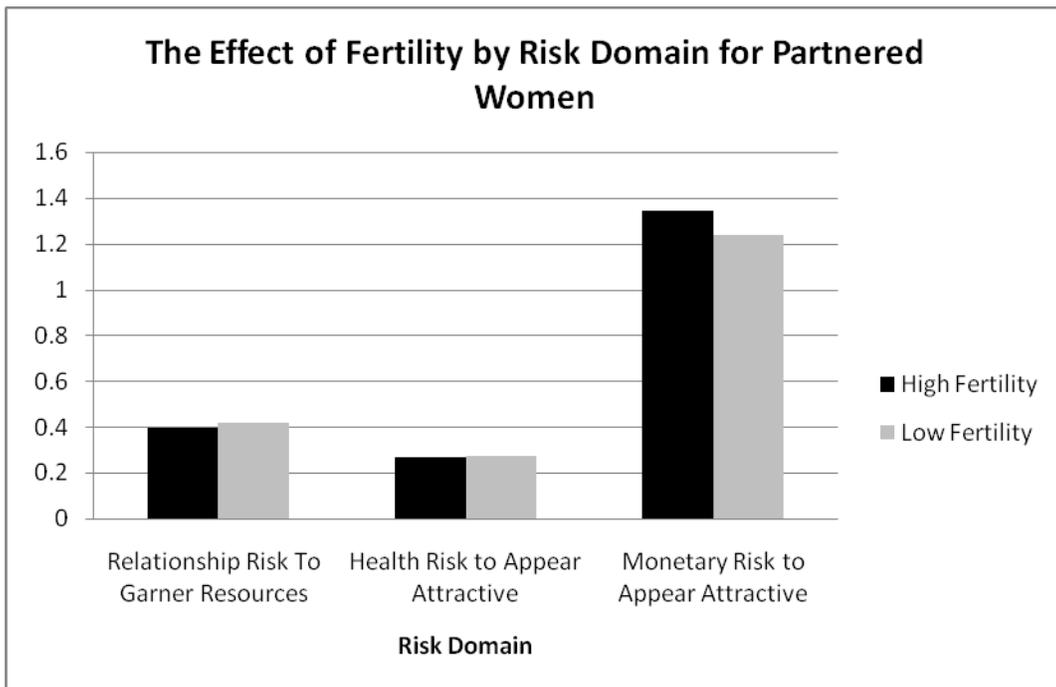


Figure 9. The effect of fertility on risk across domains for women in relationships.



The Influence of Physical Attractiveness on the Ovulatory Shift in Risk-Taking by Domain

There was a significant fertility session x risk domain x attractiveness interaction, $F(2, 104)=3.50, p=.034$. Contrary to predictions, women with higher self-perceived attractiveness were more likely to accept an increased risk of future relationship demise to obtain higher quality resources than same-sex peers at high fertility compared to low fertility, partial $r(105)=.20, p=.04$. Self-perceived attractiveness did not influence the effect of session for *health* or *monetary* risks to appear more attractive than same-sex peers.

The Influence of Same-Sex Peers on the Ovulatory Shift in Risk-Taking by Domain

There was no effect of stimuli condition (attractive local women, average local women, attractive distant women, average distant women, attractive local men, average local men, attractive distant men, average distant men, and landscapes) on willingness to incur a risk to gain position on same-sex peers across risk domains.

Control for Confounds

Analyses were also run to examine the effects of family and participant socio-economic status, order-of-session (high vs. low-fertility session first), days-to-menstrual onset (number of days until onset of menstruation following low-fertility testing), and days-to-ovulation (number of days to ovulation the high-fertility session was completed) on the dependent measure. There were no interactions between these measures and risk-taking across fertility sessions.

Discussion

Out of the 20 risk items, 11 means were above zero, indicating an increase in women's willingness to take a risk at high fertility. However, of the 20 items, only two were statistically

significant. Women were more likely to accept an increased risk of future relationship demise at high fertility to receive an expensive *designer handbag* and a *4kt diamond ring* from their romantic partners while same-sex peers received similar items of lesser value. Women were marginally more likely to take risk to obtain a higher salary and a more attractive romantic partner at high fertility. There was no significant increase at high fertility in women's general likelihood of incurring a risk to obtain a higher IQ or look more attractive than same sex peers.

Predictions 1 and 2 were not supported. There was no overall effect of fertility on the likelihood women would incur a *health* or *monetary* related risk to appear more attractive than same-sex peers. However, partially consistent with Prediction 2, women were significantly more likely to spend money they did not have to appear more attractive than to accept a health-related risk or a risk to relationship to become more attractive or obtain higher quality material resources. This finding suggests that individuals may view the costs associated with spending on credit as lesser than the costs associated with other risk domains.

Consistent with Prediction 3, women were more likely to incur a risk of future relationship demise to obtain immediate, higher quality resources at high compared to low fertility. Women appear to be more risk-seeking in competing for material resources (i.e., direct benefits) when conception probability is highest. Although there are clear benefits available to women from securing short-term sexual partners high in genetic quality at high fertility (e.g., see Gangestad et al., 2005a), women's efforts may be best utilized by ensuring partner resource investment (direct benefits) first, and seeking mates high in genetic quality (indirect benefits) after direct benefits are secured. Therefore, the function of an increase in intrasexual competitiveness at high fertility may be to secure the highest quality resources available. As such, fertility-induced shifts in motivation to appear attractive may constitute a proximate-level

goal that has been reliably correlated with successfully securing material resources over evolutionary time.

In line with Prediction 4, single women were more likely to take a risk to secure high quality resources near ovulation. This finding is consistent with the idea that motivation to compete for material resources at high fertility is paramount when women are unpartnered and, thus, resource investment may not be secured. Indeed, research documenting heightened desire for men possessing characteristics thought to be indicative of high genetic quality were found specifically for partnered women, who presumably already have secured resources (e.g., symmetry, Gangestad, et al., 2004; Gangestad & Thornhill, 1998; facial masculinity, Penton-Voak et al., 1999; major histocompatibility complex gene compatibility, Garver-Apgar et al., 2006). This preference was especially strong for women with primary partners who lack these quality markers (Gangestad et al., 2005a; Garver-Apgar et al., 2006; Pillsworth & Haselton, 2006).

Further, single women were also more likely to take diet pills to obtain higher *body* attractiveness than same-sex peers at ovulation. However, contrary to predictions, women in relationships were more likely to opt for cosmetic surgery to have higher *facial* attractiveness at high fertility. These findings suggest that fertility-related shifts in desire to enhance *body* attractiveness may reflect shifts in motivations that are more relevant to single than to partnered women, while the opposite may be true for *facial* attractiveness. This interpretation is consistent with prior findings on changes in dress across the menstrual cycle. Researchers have demonstrated that women dress more provocatively when ovulating, a behavior found to be especially pronounced in those actively seeking romantic partners (Durante et al., 2008). However, a study with only mated participants did not find an ovulatory increase in choice of

revealing or sexy dress, but did find that photographs of the women were rated as “trying to look more attractive” at high fertility compared to low fertility (Haselton et al., 2007). One interpretation is that single women are likely more active on the mating market and *bodily* cues to fertility and/or reproductive quality play a greater role in mate attraction than *facial* attractiveness. Thus, partnered women may be more inclined to compete directly with other women in terms of *facial* attractiveness to maintain the interest of one's current partner and deter interlopers. However, this interpretation is somewhat speculative and further work with more direct measures of female competition is required to verify the underlying function, if any, in the observed differences in attractiveness-enhancement motivation.

Prediction 5 was not supported and, contrary to predictions, women higher in physical attractiveness were more likely to incur a risk of future relationship demise to obtain higher quality resources than same-sex peers at high fertility. Previous research has found that attractive women have especially high mating standards (Buss & Shackelford, 2008). Because it is difficult to obtain a partner who is a good provider and also has good genes, women often have to trade off between having a long-term mate who provides continual material resources, or more physically attractive, short-term sexual partners with good genetic resources (Gangestad & Simpson, 2000). However, highly attractive women demand greater amounts of both types of resources in a male partner, in addition to good parenting and partner skills (Buss & Shackelford, 2008). Thus, physically attractive women may have more mating alternatives and fewer reasons to be committed to any particular partner. A risk to relationship success, therefore, may carry less weight for attractive women who have a greater chance of finding a high quality alternative mate.

Finally, no support was found for Prediction 6. Neither same-sex rivals nor opposite-sex others influenced the effect of fertility on willingness to incur a risk to gain position on rivals. Additional data analyses are currently under way to more fully probe the influence of same-sex competitors and potential mates on fertility-induced shifts in risk-taking, as well as the other moderating variables of interest. These more detailed analyses, coupled with new research being developed to extend the current findings, may help elucidate the nature of risk-taking in women's social competition.

Limitations and Future Directions

One important limitation of the current study is the use of a forced-choice measure with hypothetical outcomes. Specifically, women were chose between incurring a significant risk for a positionally greater, but absolutely smaller amount of the same good or attribute versus incurring little to no risk for an absolutely greater, but positionally smaller amount of a good or attribute. This forced-choice methodology effectively bundled three variables and did not incorporate a full factorial design (risk level x positional amount x absolute amount). A more complete experimental design could potentially reveal more specific effects than the current design revealed. It is also possible that the hypothetical forced choices may not have adequately captured the risk and positional tradeoffs that women face in real-life decisions. For example, some women may not even be aware of the underlying risk involved in their decisions to gain positional advantage. In addition, the study did not allow participants the option of having the same amount of the described goods or attributes as their same sex competitors. It is thus possible that women ideally prefer to be neither better nor worse off than their competitors. Additional research is needed to rule out the possibility that risk-taking to gain position on same-sex peers is an artifact of laboratory research methodology.

Conclusion

In summary, Study 4 found limited, mixed support for the hypothesis that women are more willing to incur various long-term risks in order to secure immediate positional advantages over same-sex peers during high versus low fertility but uncovered an important contingency in fertility-induced risk-taking. Women were more willing to incur relationship risks to obtain immediate resources at high versus low fertility, and this was especially true for single women, who may place a greater priority on obtaining resources than partnered women do, and for physically attractive women, who may be in a better position to find quality alternative mates.

The current study is the first to examine domain-specific contingencies in fertility-induced increases in women's intrasexual competitive behavior. Although the benefits associated with successful intrasexual competition are not limited to the brief window of fertility within the human menstrual cycle, the observed increase in competitive motivation likely reflects the operation of the same adaptive mechanisms that regulate mating decisions across the human life cycle. Unlike modern women, ancestral females faced long periods of suppressed fertility due to pregnancy, extended lactation, and energetic stress (Ellison, 2004). Therefore, psychological mechanisms may have evolved to rely on a hormone that regulates fertility (i.e., estradiol) as an overall index from which to calibrate mating psychology. As estradiol reaches its highest level near ovulation, within-cycle preference shifts may be generated even if the primary mechanism is designed to adjust mating psychology across lifespan fertility (Roney & Simmons, 2008). Thus, aside from the possibility that within-cycle fertility-induced shifts in competitiveness are themselves adaptive, they may, more generally, provide a looking-glass snapshot into the nuances of human female social behavior.

6. Have you had sexual intercourse with anyone other than your partner since you got involved with him?

_____ Yes _____ No

7. Has your partner had sexual intercourse with anyone other than you since you got involved with him?

_____ Yes _____ No

8. Please rate your sexual satisfaction with your current relationship? (circle one)

1 2 3 4 5 6 7

Extremely dissatisfied Neutral Extremely satisfied

9. Please rate your emotional satisfaction with your current relationship. (circle one)

1 2 3 4 5 6 7

Extremely dissatisfied Neutral Extremely satisfied

10. Please rate your overall satisfaction with your current relationship. (circle one)

1 2 3 4 5 6 7

Extremely dissatisfied Neutral Extremely satisfied

11. I am attracted to (check all that apply)

_____ People of the opposite sex _____ People of the same sex

12. Please rate the degree to which you typically seek or have sought long and short-term relationships for each:

(indicate 0 if you have not had intercourse with any of these partners)

Desirability Scales

Instructions:

If you are currently in a relationship, the following sections will ask you to rate your current partner's and your own attractiveness to members of the opposite sex, relative to others in your peer group and relative to each other. **Please complete all 3 sections.**

If you are not currently in a relationship, please skip Section II & Section III and **complete Section I only.**

Section I: Self Desirability (please check mark your answer)

1. How desirable do you think men find you as a *short-term mate or casual sex partner*, compared to most women?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9
Not at all				Average				Extremely
Desirable								Desirable

2. Compared with most women, how *attractive* is your *body* to men?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9
Not at all				Average				Extremely
Attractive								Attractive

3. How desirable do you think men find you as a *long-term mate or marriage partner*, compared to most women?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9
Not at all				Average				Extremely
Desirable								Desirable

4. Compared with most women, how *attractive* is your *face* to men?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9
Not at all				Average				Extremely

10. Compared with most women, how *intelligent* would men say you are?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9
Not at all Intelligent				Average				Extremely Intelligent

IF you are NOT in a Current Relationship skip Section II & III.

Section II: Partner Desirability (please check mark your answer)

1. How desirable do you think women find *your partner* as a *short-term mate or casual sex partner*, compared to most men?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9
Not at all Desirable				Average				Extremely Desirable

2. Compared with most men, how *attractive* is *your partner's body* to women?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9
Not at all Attractive				Average				Extremely Attractive

3. How desirable do you think women find *your partner* as a *long-term mate or marriage partner*, compared to most men?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9
Not at all Desirable				Average				Extremely Desirable

4. Compared with most men, how *attractive* is *your partner's face* to women?

Not at all
Sexy

Average

Extremely
Sexy

10. How *intelligent* would women say *your partner* is, compared to most men?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9
Not at all Intelligent				Average				Extremely Intelligent

Section III: Relative Desirability (please check mark your answer)

1. How easy or difficult would it be for *you* to find a *long-term mate* (e.g. a partner in a long-term committed relationship or marriage) who is as *desirable* as your current partner?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9
Very easy to find				Moderately Difficult				Extremely Difficult

2. How easy or difficult would it be for *you* to find a *short-term mate* (e.g. a partner in a one-night sexual encounter or brief affair) who is as *desirable* as your current partner?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9
Very easy to find				Moderately Difficult				Extremely Difficult

3. How easy or difficult would it be for *you* to find a *short-term mate* (e.g. a partner in a one-night sexual encounter or brief affair) who is as *sexy* as your current partner?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9
Very easy to find				Moderately Difficult				Extremely Difficult

4. How easy or difficult would it be for *your partner* to find a *long-term*

mate (e.g. a partner in a long-term committed relationship or marriage) who is as *desirable* as you?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9
Very easy to find				Moderately Difficult			Extremely Difficult	

5. How easy or difficult would it be for *your partner* to find a short-term mate (e.g. a partner in a one-night sexual encounter or brief affair) who is as *desirable* as you?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9
Very easy to find				Moderately Difficult			Extremely Difficult	

6. How easy or difficult would it be for *your partner* to find a short-term mate (e.g. a partner in a one-night sexual encounter or brief affair) who is as *sexy* as you?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9
Very easy to find				Moderately Difficult			Extremely Difficult	

Confidential Biographical Information:

1. What is your age? _____

2. What is your race/ethnicity? (check all that apply)

_____ African American/Black _____ Hispanic/Latino

_____ Asian American/Asian _____ Caucasian/White

_____ Native American _____ Middle Eastern

_____ Other (please specify): _____

APPENDIX B

Please check the box provided to indicate selection.
YOU MAY SELECT ONLY ONE OPTION.

1.

Choice A: Your romantic partner drives a Honda Civic; your same-sex peers' romantic partners drive Cadillac Escalades. There is a 10% chance you will no longer be together in 6 months.

Choice B: Your romantic partner drives a Cadillac Escalade; your same-sex peers' romantic partners drive Honda Civics. There is a 80% chance you will no longer be together in 6 months.

2. Assume attractiveness is measured on a scale from 1 (lowest) to 10 (highest).

Choice A: Due to a revolutionary new surgical technique, you are an 8 in facial attractiveness and your same-sex peers are a 6. You have an 80% chance of getting wrinkles in 10 years.

Choice B: You are a 6 in facial attractiveness and your same-sex peers are an 8. You have a 15% chance of getting wrinkles in 10 years.

3.

Choice A: After taking an herbal supplement on a regular basis, you have an IQ of 130 and your same-sex peers average 100. You have an 80% chance of acquiring Alzheimer's disease at age 65.

Choice B: You have an IQ of 100 and your same-sex peers average 130. You have a 15% chance of acquiring Alzheimer's disease at age 65.

4.

Choice A: Your romantic partner buys you the newest Prada bag; your same-sex peers' romantic partners buy them the newest Banana Republic bag. There is an 80% chance your partner will cheat on you.

Choice B: Your romantic partner buys you the newest Banana Republic bag; your same-sex peers' romantic partners buy them the newest Prada bag. There is an 10% chance your partner

will cheat on you.

5.

Choice A: You accept a job offer out of college that pays \$80,000/year and your same-sex peers average \$50,000/year. There is an 80% chance that the skills you acquire at this job will be completely obsolete in 10 years, leaving you with no good career options at that time.

Choice B: You accept a job offer out of college that pays \$50,000/year and your same-sex peers average \$80,000/year. There is a 15% chance that the skills you acquire at this job will be completely obsolete in 10 years, leaving you with no good career options at that time.

6.

Choice A: You start dating a person who is a 6 in attractiveness and your same-sex peers are dating people who average 8. This person is 15% likely to cheat on you.

Choice B: You start dating a person who is an 8 in attractiveness and your same-sex peers are dating people who average a 6. Due to your attractiveness being slightly lower than his/her, this person is 80% likely to cheat on you.

7.

Choice A: You begin a tanning program that guarantees you the most natural, sun-kissed glow. There is a 60% chance you will have skin damage from the procedure 10 years from now.

Choice B: You stay away from natural and artificial sun exposure. There is a 5% chance you will have skin damage from general exposure 10 years from now.

8.

Choice A: Your romantic partner earns \$80,000 a year; your same-sex peers' romantic partners earn \$50,000 a year. There is an 75% chance you will no longer be together in 6 months.

Choice B: Your romantic partner earns \$50,000 a year; your same-sex peers romantic partners earn \$80,000 a year. There is an 5% chance you will no longer be together in 6 months.

9.

Choice A: Your romantic partner takes you camping at local park over a long weekend; your

same-sex peers' romantic partners take them to Paris for a long weekend. There is a 5% chance your partner will cheat on you.

Choice B: Your romantic partner takes you to Paris for a long weekend; your same-sex peers' romantic partners take them camping at a local park over a long weekend. There is a 75% chance your partner will cheat on you.

10.

Choice A: You are a 6 in body attractiveness and your same-sex peers are an 8. You have a 15% chance of gaining 75 lbs. in 10 years.

Choice B: Due to a revolutionary new diet pill, you are an 8 in body attractiveness and your same-sex peers are a 6. You have an 80% chance of gaining 75 lbs. in 10 years.

11.

Choice A: Your romantic partner buys you a 4kt ring from Tiffany's; your same-sex peers' romantic partners buy them 1kt rings from Macy's. There is a 75% your partner will cheat on you.

Choice B: Your romantic partner buys you a 1kt ring from Macy's; your same-sex peers' romantic partners buy them 4kt rings from Tiffany's. There is a 5% chance your partner will cheat on you.

For questions 12 through 14, imagine that you've secured a date with someone you've been very interested in.

12.

Choice A: You significantly exaggerate your income. By making this exaggeration you're confident there's a 90% probability that you'll get another date but an 80% chance your date will find out a month down the road and no longer be interested in you.

Choice B: You are upfront about having a relatively low income. By having provided this information, you estimate there's a 15% chance of getting a second date.

13.

Choice A: You are upfront about not having a job lined up. By having provided this information, you estimate there's a 25% chance of getting a second date.

Choice B: You lie about having a job lined up. By lying you're confident there's an 80% probability that you'll get another date but a 90% chance your date will find out a month down the road and no longer be interested in you.

14. You do not like exercising or eating well to maintain your weight. You are going on vacation soon and because you want to be thin and appear in shape, you have decided to take diet pills to control your appetite. You know this is not something you can do for a long period of time.

Choice A: You are upfront about taking the diet pills. By having provided this information, you estimate there's a 15% chance of getting a second date.

Choice B: You lie and say that your physique is the result of eating healthy and exercising. By lying you're confident there's a 90% probability that you'll get another date but an 80% chance your date will find out a month down the road and no longer be interested in you.

For questions 15 through 20, imagine you have a big social event to attend where there will be a lot of single, attractive men and women in attendance. You have been anticipating the event for some time.

Imagine that you don't have any available cash right now. However, you do have a credit card to use. The credit card will accrue interest but you do not have to pay the card off in full each month.

15.

Choice A: You purchase an outfit from a top designer in New York that looks better on you than anything you've ever tried on. You can have it today, before anyone else can buy it, for \$350.

Choice B: You wear an outfit you already own to the event. Purchase the designer outfit in 6 months when it is on clearance for \$100.

16.

Choice A: You purchase make-up and facial products from the corner drug store (e.g., Walgreens, CVS). Total price is \$20.

Choice B: You purchase new make-up and facial products from a luxury department store that are on sale. The new items will give you plumper lips and softer, more even skin. Total price is \$80.

17.

Choice A: You purchase a state-of-the-art tanning package from a local spa that uses the latest technology to give you the most natural, healthy glow without any skin damage. The total cost for the program is \$450.

Choice B: You use traditional tanning beds at \$5/session. The tanning beds significantly increase the probability of seeing skin damage in 10 years.

18.

Choice A: You spot and purchase shoes to go with your outfit at a local shoe warehouse. Sale price is \$45.

Choice B: You spot and purchase the latest designer shoes from a sample sale that compliment your outfit for the event and make your legs look longer and leaner than they actually are. Sample sale price is \$150.

19.

Choice A: You do your own hair and styling for the event with new products you purchased for \$40.

Choice B: You go to your favorite salon for a day of pampering (including hair styling, manicure, and make-up) for \$150.

20.

Choice A: You purchase a bra to wear under your outfit at Victoria's Secret for \$20.

Choice B: You purchase a bra to wear under your outfit at Victoria's Secret for \$75. It is the new bra line that enhances and lifts your bust line and contours your body with no skin pinching or wires.

APPENDIX C

1. What is your current income bracket?

- < 15,000/year 15,000 - 30,000/year
 30,001- 50,000/year > 50,000/year

2. What is your parent's current income bracket?

- < 15,000/year 15,000 - 30,000/year 30,001 - 50,000/year
 50,001 – 75,000/year 75,001 – 100,000/year 100,001 – 150,000/year
 150,001 – 200,000/year 200,001 – 300,000/year >300,000/year

3. What is your relationship status?

- Single In a relationship

If SINGLE, please answer questions 4 through 7. If IN A RELATIONSHIP, please skip to question 8.

4. How much do you desire a long-term relationship?

Not at all			Somewhat			Very much		
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8	<input type="checkbox"/> 9

5. How much effort are you putting in to acquiring a long-term mate?

Not effort			Some effort			A lot of effort		
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8	<input type="checkbox"/> 9

6. How much do you desire a short-term relationship?

Not at all			Somewhat			Very much		
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8	<input type="checkbox"/> 9

7. How much effort are you putting in to acquiring a short-term mate?

Not effort			Some effort			A lot of effort		
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8	<input type="checkbox"/> 9

If IN A RELATIONSHIP, please answer questions 8 and 9.

8. How secure do you feel your relationship is?

Not secure			Somewhat secure			Extremely secure		
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8	<input type="checkbox"/> 9

9. How committed do you feel the relationship is?

Not committed			Somewhat committed			Extremely committed		
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8	<input type="checkbox"/> 9

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