Variability in Women's Perception of Potential Female Rivals: Effects of Fertility, Mating Orientation, and Revealing Dress Biases

Katelyn M. Gomes

Health, Hormones, & Behaviour Laboratory (HHAB Lab)

Department of Psychology

Lakehead University, Thunder Bay, Ontario

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Supervisor: Kirsten Oinonen, Ph.D., C.Psych.

Second Reader: Josephine Tan, Ph.D., C.Psych.

Internal Examiner: Mirella Stroink Ph.D.

External Examiner: Dr. Jennifer Gordon, Ph.D. C.Psych.

Abstract

Two studies were conducted to better understand individual difference factors that influence women's mating-relevant perceptions of other women. In Study 1, biases about revealing dress were examined and the extent to which mating-relevant individual differences variables are associated with these biases. Study 2 examined whether jealousy and perceptions of potential mating rivals and style of dress change with fertility across the menstrual cycle. Results from the first study revealed that women judged more revealingly dressed women to be more attractive, feminine, promiscuous, and flirtatious; and less trustworthy, nice, and intelligent than less revealingly dressed women. Other revealing dress biases included a non-friend bias, a jealousy bias, and a rival bias (i.e., the report that one's partner would be more attracted to her). Characteristics of the observing women (e.g., relationship status, virginity status, and hormonal contraceptive use) were significantly associated with specific revealing dress biases. In addition, compared to women with low short-term mating orientation (STMO), women with high STMO showed more of the attractiveness revealing dress bias; and less of the untrustworthy, not-nice, unintelligent, promiscuous, flirtatious, and not-friend revealing dress biases. In Study 2, women viewed revealingly dressed women more negatively when fertility was high versus low. Women were also more jealous of all potential rivals (regardless of clothing style) at higher versus lower fertility cycle phases. In addition, women low on STMO were more jealous of all potential rivals at higher versus lower fertility days, while women high on STMO showed the opposite pattern. The results from these studies have implications for understanding individual differences in women's perceptions and attributions about other women based on style of dress and provide support for the existence of mating-relevant evolutionary mechanisms in revealing dress biases.

Keywords: perceptions of women, biases of revealing dress, menstrual cycle, short-term mating orientation, competitor derogation, mate rival

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Chapter 1:

General Literature Review and Introduction

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Women differ in the extent to which they engage in short-term (ST) or long-term (LT) mating strategies. A woman's mating strategy may affect how she views other women and her relationships with other women. Given that survival of the species (and one's own genes) is dependent on finding a mate for conception and a mate to aid in raising offspring (not necessarily the same mate), women have evolved adaptations to aid in this endeavour. While good relationships with other women can be beneficial for many reasons (e.g., extra parental care), other women also represent mating rivals (i.e., individuals one competes with to obtain access to a potential mate). Thus, women's perceptions of other women may be influenced by the extent to which they view or perceive other women as potential rivals. This can be influenced by the perceiving woman's investment in short-term (ST) and long-term (LT) mating, and the extent to which she perceives the other woman as being invested in ST and LT mating. Revealing dress is often perceived as suggesting interest in sex or a ST relationship. Thus, women who dress in a revealing fashion may be more likely to be perceived as mate rivals or as women who men may be interested in for ST sexual relationships. The present dissertation examines women's perceptions of revealingly dressed women, whether any biases in perception are related to women's mating strategies, and whether changes in women's fertility is related to biases of revealing dress.

ST mating is defined as fleeting sexual encounters such as hookups or one-night stands. Between these two extremes on this relationship continuum are brief affairs, prolonged romances, and other intermediate-term relationships (Buss, 2005). LT mating is typically marked by extended courtship, heavy investment, the emotion of love, and the dedication of resources to

the relationship and any offspring that result (Buss & Schmitt, 1993). Before discussing some of the main evolutionary theories of human mating, it is first important to discuss the reproductive constraints of humans that have helped shape mating behaviours. As suggested by Buss and Schmitt (1993), men have historically been constrained in their reproductive success only by the number of fertile women they can successfully mate with (i.e., inseminate). Furthermore, this reproductive constraint is further separated into four distinct problems that men have to solve in order to effectively pursue ST partners: (a) find a high number of partners; (b) identify sexually accessible women (i.e., identify women who are willingly sexually available to men; Clements-Schreiber, Rempel, & Desmarias, 1998); (c) identify fertile women; and (d) minimize commitment and investment. Buss and Schmitt also identified reproductive constraints in men's pursuit of LT partners. The pursuit of LT partners has also been separated into four adaptive challenges: (a) identification of reproductively valuable women; (b) ensuring certainty in paternity to minimize risk of cuckoldry; (c) identification of women with good parenting skills; and (d) identification of women who are willing and able to commit to a LT relationship to minimize the likelihood of cuckoldry.

Women have also been faced with reproductive constraints which have been separated into two adaptive problems that need to be solved in order to pursue ST mates: (1) immediate resource extraction, including access to good genes and resources/finances; and (2) access to potential LT mates through ST partnerships (Buss & Schmitt, 1993). For example, women may "try out" or date ST partners in order to see how good they would be as LT partners. Women's reproductive constraints in pursuing LT partners has also been divided into five adaptive challenges: (a) identification of men who have the ability to invest resources in her and their offspring on a LT basis; (b) identification of men who are willing to invest in her and their

offspring on a LT basis; (c) identification of men with good parenting skills; (d) identification of men who are willing and able to commit to a LT relationship; and (e) identification of men who are able and willing to protect them from aggressive others. Arguably, identification of partners with good genes is also an important problem to solve when pursuing both LT and ST partners. As well, there may also be the problem of fending off potential rivals, which can be considered an important strategy in ST and LT mateships for both women and men. Men and women have evolved psychological and behavioural mechanisms that serve to solve these adaptive problems in order to effectively pursue LT- and ST- partnerships.

Evolutionary Theories of Mating

Sexual selection. One of the first theories that was proposed to explain sexual behaviour was developed by Darwin in 1871. Darwin proposed a theory of sexual selection that describes the evolution of characteristics that give animals reproductive advantage, as opposed to survival advantage. Darwin suggested that there are two ways in which one can become reproductively advantaged: (a) having success at intrasexual competition (e.g., a male stag defeating another and having greater access to mates); and (b) having success at intersexual competition (e.g., a peacock showing its feathers and attracting a mate) (Buss & Schmitt, 1993). Specifically, Darwin described sexual selection as competition within one sex for access to members of the opposite sex (i.e., competing with others to attract a mate) and differential choice by members of one sex for members of the opposite sex (i.e., choosing some mates rather than others) (Trivers, 1972). The characteristics that lead to success in mating competition or attraction evolved because they gave species a reproductive advantage. In the context of humans, the success of individuals who compete with a same sex rival reflects their relative reproductive value (i.e., relative likelihood of genetic fitness). Likewise, individuals who possess indicators of good genes or physical

attractiveness are also more likely to be chosen as potential mates since their appearance may signal gene quality and reproductive value. As proposed by the Fisherian model, parents' physical attractiveness is likely to be inherited by offspring (see Prokop, Michalczyk, Drobniak, Herdegen, & Radwan, 2012 for a review on the Fisherian model). Thus, attractiveness may be heritable.

Sexual strategies theory. Buss and Schmitt (1993) proposed their sexual strategies theory (SST), which suggests that men and women have evolved to use a complex repertoire of ST and LT mating techniques. A core principle of SST is that human mating is inherently strategic such that humans seek certain mates to solve specific adaptive challenges faced by our ancestors, and human mate preferences and mating decisions are hypothesized to be strategic consequences of selection pressures functioning during ancestral environments (Buss & Schmitt, 1993). It is important to note that these strategies are not necessarily consciously planned, but instead represent the implicit goal-directed and problem-solving nature of human mating behaviour. The key premise of SST is that mating behaviours are context dependent and highly sensitive to the differences in ST versus LT partnerships. Since men and women have faced different adaptive mating challenges over their evolutionary history in at least some finite temporal contexts, the principles that govern the mating of men and women are predicted to be different in these contexts and as such, women and men have evolved some different mating mechanisms. SST suggests that both sexes pursue ST and LT mating but with different strategies and for various reasons. Specifically, men may pursue ST mateships in order to pass on their genes while women may pursue ST mateships in order to obtain a partner with high quality genes (e.g., physical attractiveness and health) that can be passed onto offspring. Likewise, men

may engage in LT mating in order to secure certainty in paternity while women may engage in LT mating in order to secure parental support.

Strategic pluralism theory. Another theory that has been proposed to describe differences in human mating behaviours is strategic pluralism theory (SPT). SPT suggests that mating strategies are more pluralistic or diverse within each sex rather than between the sexes (Gangestad & Simpson, 2000). Specifically, SPT suggests that ST and LT mating are divergent mating strategies rather than one leading to the other (i.e., ST mating to assess for LT potential). Essentially, the primary strategy for males and females involves the pursuit of a LT committed relationship, with the pursuit of ST opportunistic mating as a secondary tactic. Furthermore, LT relationships are a pillar of human mating because of the fitness benefits they generate for both sexes via cooperative investment in offspring and the sexual division of labour.

In terms of specific mating behaviours, SPT posits that women ST mate independent of their LT desires in order to obtain genetic benefits for potential offspring (Gangestad & Simpson, 2000). Furthermore, SPT suggests that men have evolved to pursue reproductive strategies that are contingent on their value on the mating market. Specifically, men with high genetic fitness (e.g., physical attractiveness) have a tendency to engage in ST mating (i.e., in order to pass on their good genes) while men's propensity to invest in single LT relationships is inversely related to their genetic fitness (e.g., physical unattractiveness). Thus, men with low genetic fitness instead invest resources and parental support. This is due to the fact that unattractive men are less likely to find ST partners, and thus their best strategy is to invest in LT relationships by providing resources. For example, a study conducted by Gangestad and Simpson (2000) found that symmetrical men were less honest with their partners, sexualized other women more, and spent less time with their partners than asymmetrical men. This study suggests that attractive

men may invest less in their LT relationships, and thus supports SPT. However, men at all levels of attractiveness are hypothesized to engage in LT mating due to the benefits a LT mateship generates for both sexes via cooperative investment in offspring and the sexual division of labour. SPT suggests that what distinguishes men with better phenotypic conditions (i.e., attractiveness) from those with poorer conditions (i.e., unattractiveness) is not that they are inclined to forego the benefits of LT relationships, but instead that they can more often afford to pursue ST mating opportunities as a supplemental tactic (Lukaszewski, Larson, Gildersleeve, Roney, & Haselton, 2014).

SPT, which focuses on within sex differences in mating behaviours, differs from SST, which focuses more on between sex differences in mating behaviour. The main differences between SPT and SST is that SPT posits that women have evolved to evaluate men on two basic dimensions: (1) the degree to which a potential mate is likely to be a good provider/investor in offspring, and (2) the degree to which a potential mate shows evidence of good genetic quality (Gangestad & Simpson, 1990). Assuming that it would have been difficult for most individuals to attract and retain mates who scored high on both dimensions (given that such high quality mates should have been desired and may have been constantly pursued by other attractive people), SPT contends that most men and women probably had to make "trade-offs" between the two dimensions when choosing mates. Conversely, according to SST, human mating is "strategic" in that people seek out mates to solve specific adaptive problems that our ancestors recurrently faced (Buss & Schmitt, 1993). Mate preferences and mating strategies, therefore, are believed to have been molded by specific selection pressures in evolutionary history. However, both SST and SPT contend that mating strategies should be context-dependent, resulting in both ST and LT strategies within each sex.

Parental investment theory. Another theory that has been offered to explain sex differences in mating is the parental investment theory, which also relates to Darwin's sexual selection theory (Brand, Markey, Mills, Hodges, 2007; Trivers, 1972). This theory focuses more on how men and women have different obligatory investments in their offspring. Generally, women are required to invest a year or more in pregnancy and lactation in order for their offspring to have a chance of survival, while men only need to invest in the act of sexual intercourse and any behaviours that lead up to such an act. Due to the different levels of investment each sex makes, the mating strategies of men and women are expected to differ (e.g., sex differences in ST versus LT mating and sociosexual orientation). The lesser investing sex, which in humans is men, are more likely to devote a large proportion of their mating efforts to ST mateships with multiple partners (Buss & Schmitt, 1993). However, the greater investing sex, which in humans is women, are more likely to engage in LT mating with higher quality mates in order to provide potential offspring with both healthy genes and resources (Simpson & Gangestad, 1991). Since the reproductive opportunities and reproductive constraints differ for each sex, the adaptive problems that women must solve when pursuing a ST versus LT strategy are different from those that men must solve (Buss & Schmitt, 1993). Based on the parental investment theory, each sex is hypothesised to pursue each mating strategy (i.e., ST and LT) for various distinct reasons. For example, men seek ST relationships, but may use LT relationships to ensure paternity. Furthermore, Buss and Schmitt (1993) found in their sample of 148 college students that men were more interested in seeking ST partners than women. Indeed, research has shown that, on average, men are more promiscuous and more interested in ST sexual relationships than women (Brand et al., 2007; Buss & Schmitt, 1993; Clark, 2004; Gangestad & Simpson, 2000; Gangestad & Thornhill, 1997b; Pillsworth & Haselton, 2006; Simpson &

Gangestad, 1991). Essentially, parental investment theory suggests that men's and women's mating behaviours are influenced by one's reproductive constraints and the different levels of investment each sex makes to offspring.

Sex Differences in ST Mating

Men and women report differences in what they desire in ST and LT partners, and how they pursue ST and LT mating strategies (Buss, 2005). According to SST, both sexes pursue ST mateships, but only in certain contexts and for different reproductive reasons (Buss & Schmitt, 1993). For women, their obligatory parental investment leaves them with little to gain in reproductive success by engaging in indiscriminate ST sex with numerous partners. However, there are some benefits of ST mating, particularly extra-pair mating with partners who can provide access to immediate additional resources (Buss & Schmitt, 1993). Extra-pair partners, who are acquired through ST mating, may also serve as potential alternative mates (e.g., a backup mate if the primary relationship dissolves or a replacement partner with higher mate value than the current partner) if women decide to engage in mate-switching or if the primary partner were to die (Thornhill & Gangestad, 2008). Women may also benefit from ST mating by gaining access to high quality genes (Gangestad & Thornhill, 1997b), gaining access to protection and immediate resources (Greiling & Buss, 2000), and evaluating men as prospective LT partners (Greiling & Buss, 2000; Schmitt & Buss, 2001).

Likewise, per SST, men appear to achieve increases in reproductive success primarily through increases in the number of sexual partners as this allows men to have several offspring with several women, and therefore the ability to maximally spread their genes throughout the gene pool (Buss, 2005; Buss & Schmidt, 1993). The ability to conceive with an indiscriminate number of women represents a strong selective pressure and makes it adaptive for men to desire

sexual variety. Although the explicit goal of most modern men may not be to sire many children with ST partners, SST proposes that a desire for multiple partners and frequent intercourse evolved for men across many previous generations because men who engaged in such a strategy passed on their genes at a higher frequency.

Characteristics Preferred in ST Partners

Some cues to mate value differ between the sexes because of differences in what is deemed physically attractive for each sex (Buss, 2005). In terms of specific attributes sought after in ST partners, research has found that men generally prefer a ST sexual partner who scores high on sexual desirability (e.g., physical attractiveness, high sex drive, sexy looking) (Regan, Levin, Sprecher, Christopher, & Cate, 2000). An indicator of sexual desirability or mate value may be the femininity of a woman's face shape, as femininity has been linked to youth and physical attractiveness (Rhodes, 2006), which is related to fertility and fecundity (Little, Jones, Feinberg, & Perrett, 2014), and is positively associated with estrogen level, a measure of reproductive health (Law Smith et al., 2006). Little and colleagues (2014) and Welling, Persola, Wheatley, Cardenas, and Puts (2013) found that men preferred femininity in women's faces more for ST relationships than LT relationships. Little and colleagues also reported that self-rated attractiveness was correlated with preference for femininity in female faces for ST relationships only, and that partnered men were more likely to prefer feminine faces. To explain the fact that partnered men are more likely to prefer feminine faces than single men, the authors suggested that partnered men have more to lose by engaging in an extra-pair ST relationships and may be generally more choosy in terms of preferences for femininity to somewhat offset the costs associated with this risk. Additionally, men who report more sensation-seeking activities, which are costly behavioural traits that may signal phenotypic quality (Bliege Bird, Smith, &

Bird, 2001) and are attractive to women (Kelly & Dunbar, 2001), express a stronger desire for feminine female faces (Jones, DeBruine, Little, Conway, Welling, & Smith, 2007). Thus, men of higher mate value may be better placed to compete for ST relationships with attractive feminine-looking women.

Physically attractive appearance is arguably the most desired characteristic when considering a casual sex partner (Regan et al., 2000). Furthermore, since female fertility is limited by health and age, male sexual attraction is primarily attached to visual stimuli, such as muscle tone, facial and body proportions, and absence of wrinkles (Grammer, Renninger, & Fischer, 2004). Since low-investment ST sex was advantageous for ancestral males, men are predisposed to attend carefully to potential sexual cues and be on the lookout for any signals that might indicate varying degrees of sexual openness. Some cues to sexual openness or interest in ST relationships may include revealing choice of clothing (e.g., tight clothing or skin-revealing clothing such as breast-revealing tops or short tight mini skirts to show off one's body), make up (e.g., red lip stick to signal sexual drive), and hair style (e.g., long lustrous hair to signal health and fertility). Research has found that men tend to rate women who wear tight and revealing clothing as sexier than women who wear less tight and revealing attire (Abbey, 1987). Moreover, Hill, Nocks, and Gardener (1987) manipulated skin display and clothing tightness on female models to see what effect this had on men's ratings of attractiveness. They found that women who accentuated their bodies were perceived as more attractive as sexual partners. However, accentuating the body decreases a woman's attractiveness as a LT partner (Hill et al., 1987). This double standard makes sense when viewed from an evolutionary perspective; in a LT relationship, men value signals of sexual restraint in a partner (Grammer et al., 2004). As such, men may use women's clothing as an indicator for whether a woman is interested in a LT or ST

relationship. This also suggests that women may use revealing or promiscuous physical presentation as a strategy to indicate interest in sex and to attract a ST partner. This strategy is highly flexible and one that can be changed whenever one chooses (e.g., wearing tight and revealing clothing to a discotheque, and modest and conservative clothing to the grocery store). Grammer and colleagues (2004) found that women at discotheques who described their clothing as sexy or bold reported a high motivation for sex. This further suggests the fact that women may choose to present themselves in a particular manner to display sexual readiness and to attract a ST partner.

Research has also found that women with more feminine faces are more inclined to pursue ST relationships than women with more masculine faces (Boothroyd et al., 2008). This raises the possibility that men have evolved to be sensitive to this female facial cue, particularly since men tend to rate more feminine female faces as less likely to be faithful, more likely to engage in ST relationships, less attractive for LT relationships, and more attractive for ST relationships (Little et al., 2014). This is further exemplified by the finding that pictures of unrestricted (i.e., people who are open to short-term relationships) female composites are judged as significantly more feminine than restricted (i.e., people who prefer long-term relationships) female composites (Boothroyd et al., 2008).

WHR may be another indicator of physical attractiveness based on the evolved preference for physical features indicating fertility and health (Singh, 1993). WHR is the ratio of waist circumference to hip circumference with the ideal ratio differing for each sex. A ratio of .67 to .80 for women indicates a reduced risk for primary infertility and various health concerns, such as cardiovascular disorders, carcinoma, and diabetes, regardless of overall levels of body fat (Buss, 2005). Furthermore, Streeter and McBurney (2002) found that a WHR of 0.7 is the most

preferred WHR and is rated the most attractive. In addition, Hughes and Gallup (2003) found that women with low WHR reported sexual intercourse at an earlier age, more sexual partners, more extra-pair copulations, and engaged in more instances of intercourse with people who were involved in another relationship. Conversely, men typically have a higher WHR than women, with averages around .90, because higher testosterone levels in men stimulate fat deposits in the abdominal region while inhibiting fat deposits on the hips and thighs (Buunk & Dijkstra, 2005). Thus, attraction to low WHR may help men identify potential healthy mates from a distance. Another anthropometric measure of attractiveness includes breast size, shape, symmetry, and firmness, which may indicate a woman's reproductive value. Specifically, it has been found that women with large breasts are judged to be most attractive, feminine, healthy, and desirable for both ST and LT relationships (Singh & Young, 1995).

Research suggests that women are typically choosier than men in their mate choice, possibly due to their greater investment in offspring, while men generally place more value on attractiveness and fertility in their partners. This may mean only certain individuals are chosen as ST sexual partners, and that this is likely based on perceived mate quality, as research has suggested that those who are perceived as physically attractive have greater mating opportunities (Buss, 2005; Buss & Schmitt, 1993; Hughes & Gallup, 2002; Jasienska et al., 2006; Singh, 1993; Tovée & Cornelisson, 2001). Consequently, if one's ability to acquire and retain an attractive partner is limited by one's own attractiveness, then pursuit of highly attractive mates by less attractive individuals could involve considerable wasted mating effort (Price et al., 2013). Thus, less attractive individuals could avoid such costs by placing less weight on others' physical attractiveness or by engaging in LT mating, where physical attractiveness is not as highly valued as it is in ST mating.

Sex Differences in LT Mating

It has been suggested that both sexes pursue LT mateships, however, similar to ST mating, such mateships are pursued only in certain contexts and for various reproductive reasons (Buss, 2005). Men may pursue LT relationships in order to secure a mate who will not risk cuckoldry by engaging in extra-pair mating as suggested by Camilleri and Quinsey (2009). Men want to be certain that they are investing in their own offspring and not unknowingly investing in someone else's. Thus, one motivation for men to engage in LT mating with one partner is to have greater paternity certainty. Furthermore, the costs and benefits of one strategy must be evaluated by contrasting them with the costs and benefits of alternative strategies (Buss & Schmidt, 1993). The primary alternative to LT mating is ST mating. However, repeatedly seeking ST mates can be costly in terms of time, energy, and resources. LT mating, on the other hand, provides men with the opportunity to develop a cooperative relationship that is characterized by the division of labour, certainty in paternity, and parental responsibility sharing (Buss & Schmidt, 1993; Gangestad & Simpson, 2000). Furthermore, most men can obtain a much more desirable mate if they are willing to invest and commit to a LT relationship. Thus, the costs of not pursuing a LT mate may be high for men.

Similarly, women engaging in LT mating are ensured long-lasting parental investment and resources from a partner (Gangestad & Simpson, 2000). LT partners may provide women with food, find or defend territories, and feed and protect the children. These reproductive resources that can be acquired by women through LT mating can be summarized into three categories: (a) an immediate resource advantage to the woman and her children (e.g., secured financial resources and property); (b) a reproductive advantage to the woman and her children garnered through LT social and economic benefits (e.g., good parenting skills, good survival

skills, a good education with a good job); and (c) a genetic reproductive advantage for her future children if variations in qualities that lead to resource acquisition are partly heritable (e.g., intelligence, physical strength, skill-set) (Buss & Schmidt, 1993). LT partners may also provide the opportunity for learning; they may transfer status, power or resources; and they may aid offspring in forming reciprocal alliances later in life.

Since each sex has some different selection pressures that guided the evolution of LT strategies, each sex may use an assortment of specific mate attraction strategies to ensure they obtain the kind of relationship they desire. Specifically, the mate preferences of one sex, which are typically shaped by the evolutionary problems that were faced by our ancestors, should influence the competitive tactics used by the opposite sex (Buss & Schmidt, 1993). Men who are interested in LT mateships may display signs of resource acquisition, ambition, maturity, parental skills, and emotional openness in order to attract a potential mate who is also interested in LT relationships, as these traits solve the problems women confronted when pursuing a LT mating strategy (e.g., resource acquisition and shared parenting responsibilities). Conversely, women may show engagement in strategies designed to increase their own signs of fertility through enhancement of their physical appearance characteristics that denote youthfulness (e.g., clothing, hair style, make-up, etc.), and signs of fidelity and trustworthiness to attract a potential mate who is also interested in LT mating.

Characteristics Preferred in LT Partners

In ST mateships, men are not particularly choosy about whom they mate with, however, in LT relationships they tend to prefer women who are sexually exclusive and display signs of fidelity in order to reduce their risk of cuckoldry and to ensure paternity certainty (Buss, 1989a; Petersen & Hyde, 2010). Signals of fertility that may be evident from a woman's youth and

physical appearance are also valued as they provide cues to a woman's mate value and potential reproductive ability. In contrast, women place a greater premium on a man's social and economic status, future resources, ambition, fidelity, and maturity, which are all cues relevant to his ability for LT mating, and to his generosity and emotional openness (Buss & Barnes, 1986), all of which may signal his mate value. The characteristics of warmth (Bleske-Rechek & Buss, 2005), kindness, intelligence, dependability, and health (Buss, 1998) are universally valued attributes by both men and women who are interested in LT mating.

Research suggests that one characteristic desired by women who are interested in LT partners is financial resources (Buss, 1998; Gueguen & Lubomir, 2012). In terms of LT mating, women are interested in men who show signs of LT career goals, likely future professional success, and financial prospects. Women interested in LT dating tend to dislike men who lack ambition, are financially poor, and who are uneducated (Buss, 1998; Buss & Schmidt, 1993).

Skin quality, such as unblemished and smooth skin, is also associated with one's mate value and subjective physical attractiveness. Skin that is smooth has been found to be linked with youth, fertility, reproductive value, and mate value in women (Buss, 2005). Clear skin in both men and women indicates the absence of skin-damaging diseases and the presence of "good genes" which may be inherited by offspring. Jones and colleagues (2004) found that participants rated men with clear skin as more attractive than men with blemished skin. Another study conducted by Grammer, Fink, Thornhill, Juette, and Runzal (2002) found that skin homogeneity predicted perceived attractiveness. It appears that skin quality may be a measure of physical attractiveness and an indicator of pathogens. Thus, individuals may seek LT partners who possess clear skin as their good health and genes can likely be passed onto offspring.

The main differences between the characteristics that are most desired of ST versus LT partners appear to be that sexual availability and promiscuity are more valued in the ST, and fidelity, trustworthiness, and parental qualities are more valued in the LT. Youth, fertility, and attractiveness are all important in both LT and ST mating contexts since they provide cues to an individual's reproductive value.

The characteristics that men and women look for in their ST and LT partners may affect women's relationships with other women and whether they view each other as potential friends or rivals. For example, if a woman possesses traits that are desired by men in a LT partner (e.g., trustworthiness and parental qualities), women who are interested in ST relationships may view her as less of a threat as she may be perceived as pursuing an opposing mating strategy and a different mating partner. This is relevant given research suggesting that women report less willingness to befriend a woman described as sexually promiscuous than one described as pursuing a LT mating strategy (Bleske & Shackelford, 2001). However, it is also possible that women who are interested in ST mateships may be more likely to view other similar women who demonstrate characteristics desired in ST partners as friends as they can function as cooperative collaborators in seeking mating partners. On the other hand, women perceived as pursuing a similar mating strategy can sometimes become sexual rivals when they pursue the same mates or attempt to poach each other's existing mates. Bleske and Buss (2000) found that, when asked to rate the most important benefits of friendship, women indicated that "having someone to go out and meet members of the opposite sex with" was one of the most important benefits. Women also rated "competing with their friend for attention from the opposite sex" as among the most important costly aspects of friendship. Thus, since women face intrasexual rivalry from their

same-sex friends, one means of monitoring this rivalry would be to take note of a friend's sexual strategy.

Sociosexual Orientation

It has been suggested that another way to conceptualize individual differences in mating strategies, particularly within men and women, relates to sociosexuality (Simpson & Gangestad, 1991). Sociosexuality refers to the interpersonal aspects of one's sexuality, specifically one's willingness to engage in sexual activity with a variety of partners without closeness, commitment, or other indicators of emotional bonding. Unrestricted sociosexuality refers to the tendency to be relatively comfortable with ST mating or having a sexual relationship without love or commitment. Individuals with an unrestricted sociosexual orientation (SO) tend to seek mates who are physically and sexually attractive, more so than those with a restricted SO (Simpson & Gangestad, 1992). Restricted sociosexuality refers to being relatively more comfortable with LT mating and requiring greater time and commitment before sexual activity which would usually take place in monogamous relationships (Simpson & Gangestad, 1991). Those with a restricted SO tend to prefer mates who are kind, affectionate, responsible, and loyal, even more so than individuals with an unrestricted SO (Simpson & Gangestad, 1992). The Sociosexual Orientation Inventory (SOI) provides one measure of individual differences in mating strategy (Simpson & Gangestad, 1991), and distinguishes between unrestricted (high SOI scores) and restricted (low SOI scores) orientations.

Interestingly, individuals who rate themselves as highly attractive tend to have a higher number of sexual partners, be sexually active earlier in life (Rhodes, Simmons, & Peters, 2005), and be sociosexually unrestricted (Mikach & Bailey, 1999). These individuals are usually rated by the opposite sex as being more physically attractive (Mikach & Bailey, 1999). Moreover,

women who report having a relatively large number of sex partners have been found to have lower waist-to-hip ratios (WHR) than women with fewer sexual partners (Schmalt, 2006). In addition, averaged faces of unrestricted men have been perceived as more masculine than averaged faces of restricted men (Boothroyd, Cross, Gray, Coombes, & Gregson-Curtis, 2011; Boothroyd et al., 2008), and more masculine-looking males have been reported to have more sexual partners than less masculine-looking males (Rhodes et al., 2005), which may suggest that sociosexuality is in part driven by male testosterone. Thus, physical features and attractiveness have been linked to sociosexuality.

Jackson and Kirkpatrick (2007) created a multidimensional measure of sociosexuality in order to assess three meaningful conceptual patterns of mating orientation: a conditional mixed ST/LT orientation (i.e., conditional on one's changes in hormone levels, the presence of rivals, or the sex ratio in a given environment), exclusive ST orientation, or exclusive LT orientation. Based on the authors' sample of 173 (94 men) participants, it was found that men and women differed more in their orientation toward casual sex than in their orientation toward LT committed mateships, with men having a more open attitude towards casual sex than women. In contrast to previous findings, Jackson and Kirkpatrick reported that, when men and women were considered together, LT mating orientation (LTMO) (i.e., restricted SO) and ST mating orientation (STMO) (i.e., unrestricted SO) were uncorrelated with any of the mate preferences they examined. However, among men, preference for parental and personal qualities significantly correlated with the LTMO scale ($r = .33$, $p < .01$), but not with the STMO scale ($r = -.02$, *ns*). Furthermore, men's preferences for attractiveness and social visibility in a mate was positively related to the STMO scale ($r = .24$, $p < .01$) and inversely related to LTMO scale ($r = -.24$, $p < .01$). LTMO and STMO were uncorrelated with mate preferences among women. Using

the Self-Perceived Mating Success Scale (Landolt, Lalumiere, & Quinsey, 1995), mate value was positively correlated with the STMO scale and negatively correlated with the LTMO scale in men. Mate value is the degree to which an individual has the capacity to promote the reproductive success of another individual by mating with him or her (Buss, 2005). Among women, however, self-perceived mate value was not significantly correlated with either scale. An interesting finding that emerged was that self-perceived mate value was positively correlated with higher levels of previous sexual behaviour in men, and this relationship was even stronger in women. Furthermore, Rhodes et al. (2005) found that women with more symmetrical bodies reported having more sexual partners, which may be a potential indicator of unrestrictedness. In addition, Clark (2004) also found evidence that less restricted (i.e., more promiscuous) women tended to rate themselves as being more attractive.

Interestingly, research has shown that individuals can accurately judge the sociosexuality of others (Boothroyd et al., 2008; Boothroyd et al., 2011; Gangestad, Simpson, DiGeronimo, & Bick, 1992). For example, after viewing 20-minute silent video recordings of target men and women being interviewed for a lunch date, Gangestad and colleagues (1992) found that observers were generally able to correctly identify the self-reported sociosexuality of the individuals depicted in the videos. The authors also found that the observers could assess the sociosexuality of the target men with greater accuracy than the target women. Male observers demonstrated better assessment of sociosexuality relative to female observers. Conversely, using composite images and real individual faces of unrestricted females faces, and composite images and real individual faces of restricted female faces, Boothroyd and colleagues (2008) found that observers (both men and women) could correctly identify restricted versus unrestricted women from cues in both composite (i.e., averaged facial images based on sociosexuality) and real faces

images, with no significant effect of observer sex. Specifically, researchers asked participants to choose the individual that they felt was more open to ST relationships, one night stands, and the idea of sex without love. However, while observers were not able to significantly differentiate between the male composites in terms of sociosexuality, they could correctly identify restricted versus unrestricted men using the real faces images. The researchers argued that they utilized both composite images and real faces because averaging images means that randomly varying traits across two groups will tend towards average in composites, while traits that are significantly different between groups will be more clear in composites. Thus, this method is ideal for detecting subtle structural differences between groups (e.g., a larger, squarer jaw) and for assessing whether groups of observers are sensitive to these differences.

Boothroyd and colleagues (2011) replicated the results of the Boothroyd and colleagues (2008) study by finding that observers could accurately determine the unrestricted face in a pair of female composite images (one restricted and one unrestricted), but not were not able to perceive the SOI of male composite images. One possible explanation for this that the authors have suggested is that the translation of unrestricted desires and attitudes into unrestricted sexual behaviour is reliant on the availability of willing partners, which may be more limiting for men than for women (Boothroyd et al., 2011). This might serve to make sociosexuality a less unitary trait for men than for women, which may attenuate the correlations between sociosexuality and facial appearance. However, it is noteworthy that the ability to estimate sociosexuality correlates positively with actual self-reported sociosexuality when both static pictures of faces and full body videos are used.

Perceptions of Women Based on Physical Presentation

Individuals frequently rely on nonverbal cues, such as physical appearance, to create impressions and formulate judgments about other people (Naumann, Vazire, Rentfrow, & Gosling, 2009). Physical appearance is composed of multiple sources of information. It contains both static components related to physical grooming (e.g., style of dress and hairstyle) and dynamic aspects related to nonverbal expressive behaviour (e.g., posture and facial expression) (Naumann et al., 2009). Research has indicated that judgments of personality based on face-to-face interactions or short video clips can be quite accurate, especially for the perception of extraversion (Hall, Andrzejewski, Murphy, Schmid Mast, & Feinstein, 2008).

How a woman dresses plays a large role in how others perceive her. Koukounas and Letch (2001) found that men rated women in revealing clothing as being more flirtatious, seductive, and promiscuous. Revealing clothing can also negatively affect perceivers' views of women's faithfulness or likeability (Cahoon & Edmonds 1989). These perceptions may have some adaptive value with choosing a partner, particularly since sexual availability and promiscuity are more valued in the ST, while fidelity, trustworthiness, and parental qualities are more valued in the LT. Thus, the ability to perceive important attributes about a person based on their style of dress is useful in determining whether that individual would be the type of partner one is looking for (i.e., if a person is seeking a ST partner, they would be looking for nonverbal cues suggesting sexual availability).

Past research has indicated a generally negative bias toward women who wear revealing clothing; and as more sexually appealing, more attractive, less faithful in marriage, more likely to engage in sexual teasing, more likely to use sex for personal gain, and more likely to be sexually experienced than women who wear less revealing clothing (Cahoon & Edmonds, 1987; Edmonds & Cahoon, 1986). Additionally, women who wear little or extremely tight clothing are

perceived as being promiscuous (Gurung & Chrouser, 2007) and less competent (Nezlek, Krohn, Wilson, & Maruskin, 2015). These perceptions have been reported by both men and women. Gurung and Chrouser (2007) had female undergraduate students rate three photographs of female Olympic athletes shown in either highly revealing or sport-appropriate outfits to examine how women view other women who wear revealing dress. The women pictured in the highly revealing condition were rated as significantly more attractive, sexually experienced, feminine, and desirable; and less capable, strong, determined, and intelligent. Related to this, Daniels and Zurbriggen (2016) found that women overall rated "sexualized" Facebook profile photos as less socially attractive (e.g., as a friend) than "nonsexualized" Facebook profile photos. Taken together, two studies have examined whether characteristics of female perceivers predict the objectification of revealingly dressed women (i.e., Daniels & Zurbriggen, 2012; Gurung & Chrouser, 2007). Taken together, research suggests that revealing dress is associated with perceptions of sexual availability and promiscuity (which are more valued in ST partners), and lower levels of fidelity and trustworthiness (which are more valued in LT partners).

Individual Differences in Mating Strategies

SST suggests that psychological mechanisms, such as mate preferences, have evolved in response to selection pressures generated by reproductive problems confronted in ST and LT mating contexts (Buss & Schmidt, 1993). It suggests that men and women have evolved to pursue both ST and LT mating strategies, but use different strategies for various reproductive reasons. While the theory mainly discusses the reasons why men and women engage in ST and LT mating, it also discusses within sex individual differences in mating strategies. For example, SST posits that sociosexuality may predict what mating strategy (i.e., ST versus LT) a person employs, suggesting that there is greater variability within each sex rather than between them.

Furthermore, SST suggests that mate value may predict what mating strategy a person uses. Men who possess the traits desired by women in ST partners (e.g., physical attractiveness and masculinity) may more frequently engage in a ST mating strategy than men who lack such traits. This is similar to what SPT has posited, that men have evolved to pursue reproductive strategies that are contingent on their value on the mating market (Gangestad & Simpson, 1990).

Much of the variation in mating strategies that occurs within women has also been studied within the context of the menstrual cycle (e.g., Gildersleeve, Haselton, & Fales, 2014). This is due to the fact that over the course of the menstrual cycle, women experience fluctuations in hormones and conception likelihood that may exert effects on mating behaviours. For example, the good genes hypothesis suggests that women should show a greater preference for partners with indicators of good genes (e.g., attractiveness, facial symmetry, masculinity) when they are most fertile (i.e., which typically peaks at times in life when estrogen is higher and progesterone is low), particularly as ST mates (Gangestad, Garver-Apgar, Simpson, & Cousins 2007; Little, Jones, Burt, & Perret, 2007b). Gangestad and colleagues (2007) found a strong relationship between menstrual cycle phase and partner preferences. It was observed that women's preferences for attractive men increased during high fertility phases but only when these men were evaluated as ST partners. The tendency to pay more attention to attractive men may have evolved for adaptive reasons since women are best able to use the heritable genes of attractive men during high fertility times. In contrast, at low fertility times (i.e., which typically occurs at times in life when estrogen is lower and progesterone is higher), other personal traits such as parenting qualities and resources may be more, or equally, salient (Buss, 2005).

Another theory that has been used to explain variation in mating strategies across the menstrual cycle is the dual strategy theory. The dual strategy theory suggests that women

copulate for two reasons: (1) during high fertility for direct genetic benefits, and (2) during low fertility to obtain indirect non-genetic material benefits (Alvergne & Lummaa, 2009; Thornhill & Gangestad, 2008). Direct benefits include good genes (which may be determined through a man's physical masculinity, Kruger, 2006), while indirect benefits include financial and parental support. This dual strategy can affect mate choice throughout the menstrual cycle, with ovulating women desiring men more for their physical attractiveness but desiring other attributes, such as security and certain emotional characteristics at other times of the menstrual cycle.

The Periovulatory Sociosexuality Tactic Shift (PSTS) (Oinonen, Klemencic, & Mazmanian, 2008) has also been used to describe variability in women's mating strategies. Oinonen and colleagues found that restricted women (i.e., those more interested in LT mating) reported an increase in interest in uncommitted sex when they are most fertile (i.e., periovulatory phase), while unrestricted women (i.e., those more interested in ST mating) shifted to show less of an interest in uncommitted sex when they were most fertile. These periovulatory phase shifts in sociosexual behaviour include a shift towards more restricted sexual behaviour in unrestricted women and toward more unrestricted sexual behaviour in restricted women. This theory predicts that restricted women may show a greater periovulatory peak in seeking ST mates with high physical attractiveness (i.e., good genes) during high fertility phases, as compared to unrestricted women. The authors suggest that these two opposing cyclical tactic shift strategies may have evolved in order to solve adaptive problems faced by women who generally pursue ST or LT mating strategies. Specifically, restricted women who switch to an unrestricted sociosexuality during higher fertility may benefit from such a shift if copulation with an extra-pair partner resulted in a high-quality offspring that could be passed off as one's primary mate's. That is, a restricted woman would benefit from a periovulatory shift toward a more unrestricted

sociosexuality during the most fertile part of her cycle if it results in an offspring with high-quality traits. Conversely, unrestricted women who shift towards a more restricted sociosexuality may benefit from copulating with previous partners as it would be costly for a new copulation to result in conception since a promiscuous woman would be unlikely to receive significant LT investment from the new copulatory partner. Thus, an unrestricted woman would benefit from a periovulatory shift toward a more restricted sociosexuality during the most fertile phase of her cycle in order to help ensure investment from a previous known partner if an offspring results from their copulation.

These theories, along with the research that has followed, suggest that women may have more than one mating strategy and that strategy shifts can occur with changes in conception likelihood and hormones. Furthermore, the cyclical hormonal mating strategy shifts may also extend to cyclical hormonal shifts in women's perceptions of same-sex rivals (Fisher, 2004). It should be noted that the overarching goal of the current project is to examine the extent to which women's mating strategies and change in fertility across the menstrual cycle affect their perception of other women as potential rivals. This was achieved in two studies. Specifically, the first study (Study 1) explores: (a) whether perceptions of women's personal attributes (e.g., intelligence, niceness, promiscuity, interest in friendship, negative impressions, and feelings of jealousy) are influenced by dressing in a revealing manner, and (b) whether women with particular mating strategies are more or less likely to endorse particular revealing dress biases. The second study (Study 2) examines how women's fertility status and mating orientation, and the potential rival's style of dress affect women's perceptions of other women. Below is a review of some research and theories of relevance to each of these studies.

Women Mating Strategies and Behaviours

Women's intrasexual competition. Intrasexual competition can be defined as two or more members of the same sex competing against each other for a resource that one of the competitors does not wish to share or does not have access to (Cox & Fisher, 2008). The resource is typically one that is limited in quantity, such that not all members of a sex have equivalent access to it, and to gain access, competition must occur. With regard to mating, women compete for access to a desired male. Thus, intrasexual competition in this regard is the use of strategies to compete with members of the same sex for mating access to members of the opposite sex (Fisher, 2004). Since all women are not equal in terms of their physical attractiveness, personality characteristics, or skills, and some have higher mate value than others, highly valued mates can thus be viewed as a resource, and are then the target of competition for mating access. Consequently, intrasexual competition has evolved as an important behavioural adaptation for attracting mates and for gathering resources necessary for reproduction. Furthermore, women compete for men since men vary in their ability to provide resources and protection in the relationship and good genes that may be passed on to offspring (Fisher, 2004). Since men vary in these abilities and their physical attractiveness, women need to compete for men who display high mate value. Men of high mate value can choose from an array of available women who seek mateships, which causes female intrasexual competition that is driven by an unequal ratio of a few attractive or highly valued men to many available women. Since research shows that men desire attractive women (Buss, 2005), mate preferences are thought to drive intrasexual competition (Fisher, 2004). Thus, from this perspective, a woman's main goal in the mating context is to make herself maximally desirable to men relative to other women who are striving to achieve the same goal (Buss & Dedden, 1990).

There are two general intrasexual competitive strategies women use: competitor derogation and self-promotion (Buss & Dedden 1990; Cox & Fisher, 2008). Competitor derogation is any act intended to decrease a rival's perceived mate value relative to one's self, while self-promotion refers to any act used to enhance the positive qualities of oneself, relative to same-sex others, with the expected duration of a potential relationship influencing the use of these strategies. For example, in terms of competitor derogation, women pursuing a ST mating strategy may describe same-sex rivals as unattractive, sexually restricted (e.g., "a prude" or "a tease"), unclean (e.g., having a sexually transmitted infection), or boring; whereas women pursuing a LT mating strategy may emphasize a rival's promiscuity, infidelity, or dishonesty (Buss & Dedden, 1990). In terms of self-promotion, women pursuing a ST relationship may emphasize their sexuality and attractiveness, whereas women pursuing a LT relationship may promote their faithfulness and sexual restrictiveness. The main focus of the current dissertation was to examine women's perception of potential female mating rivals and how this is affected by their conception likelihood and engagement in ST and LT mating strategies.

Within intrasexual competition, there are nine competitive tactics an individual can employ (Cox & Fisher, 2008). These include attempts to: (1) change the potential mate's perception of the rival's value; (2) change the potential mate's perception of their own value; (3) change the potential mate's perception of one's own value relative to others; (4) change the rival's perception of their own value; (5) change the rival's perception of the potential mate's value; (6) change the rival's perception of one's own value; (7) change one's perception of the rival's value (e.g., Fisher, 2004); (8) change one's perception of the potential mate's value; and (9) change one's perception of one's own value. The first strategy described, changing the potential mate's perception of the rival's value, may be the most effective of these tactics as it

will likely result in a decrease in the potential rival's perceived mate value and an increase in one's own mate value, relative to the rival. An example of this tactic includes a woman telling a potential partner how unfaithful a rival has been to her past boyfriends after she learns that the potential partner values loyalty in his girlfriends. This creates a context in which an individual may be able to win a competition because they now seem to possess a higher value than the rival. Consequently, the goal of competitor derogation is the relative reduction in mate value of the target rival and subsequently a reduced desire for them by potential male partners (Arnocky, Sunderani, Miller, & Vaillancourt, 2012).

One emotion that is likely associated with intrasexual competition is jealousy. Research has found that jealousy-evoking rival characteristics are consistent with research on mate preferences; men feel more jealous than women in response to a rival's status related characteristics while women feel more jealous than men in response to a rival's physical attractiveness (Dijkstra & Buunk, 2001). Furthermore, women find a potential rival's physical attractiveness (e.g., beautiful legs, narrow waist, slenderness, sexy dress, attractive face) and social dominance (e.g., women who are attentive, self-confident, assertive, charismatic, generous, popular, or who have a sense of humour) as equally jealously evoking. To explain why physical attractiveness and social dominance evoke jealousy, the researchers propose that women may view a dominant rival as threatening because she actively interferes with the individual's current relationship by luring the partner away. In addition, research has indicated that subliminal priming with line drawings (Massar & Buunk, 2010), descriptions (Massar, Buunk, & Dechesne, 2009), and pictures (Massar & Buunk, 2010) of physically attractive rivals evokes more jealously in women than physically unattractive rivals. In all three of these studies, participants were subliminally primed with rivals of varying attractiveness, read a jealousy-

evoking vignette about a potential rival in which the physical description of the rival was withheld, and then asked to indicate how much jealously they felt. These studies are in line with previous research (e.g., Dijkstra & Buunk, 2001) showing that exposure to attractive rivals evokes more jealousy than exposure to unattractive rivals and further suggests that women's jealousy is shaped by men's mate preferences.

Though jealousy is not a direct competitor derogation tactic, rival evoked jealousy may lead to the use of derogating strategies in order to attain a potential mate or maintain one's current relationship (i.e., jealousy may be a mechanism to evoke use of the strategies). It is possible that jealousy evoking rival characteristics may be used to perceive a rival's mate value, and if found to be higher than one's own mate value, may result in the use of intrasexual competitive strategies, such as competitor derogation in order to make one's own mate value higher than a rival's. However, the use of rival derogating tactics can be costly as women may expend considerable time and resources and may become vulnerable if, for example, their partner or other women resent their jealous behaviours (Fink, Klappauf, Brewer, & Shackelford, 2014). Therefore, women are expected to use these strategies only when there is discernible threat. Thus, the ability to accurately identify an attractive rival allows women to determine how desirable the rival may be to her partner, and thus the extent to which use of these intrasexual competition strategies would be advantageous.

Women's use of competitor derogation. Several studies have shown that women use strategies to derogate their rivals. Within a series of studies, Buss and Dedden (1990) found that women, more so than men, were likely to call a rival promiscuous or attack their sexual reputation, derogate their appearance (e.g., laugh at a rival's hair, call a rival fat and ugly), call them a tease, and question their fidelity as a means to make the rival appear undesirable to

potential mates. The authors argue that calling someone a tease and questioning their fidelity are tactics used to lower paternity confidence, which is a trait desired in LT partners. However, these tactics may not be as useful when trying to derogate a potential rival as a ST partner as promiscuity may be desirable in that context.

Indeed, research has found support for the notion that women's derogations influence men, as well as other women, to evaluate the derogated individual more negatively (Cox & Fisher, 2009). Specifically, women's negative statements about a potential rival's facial attractiveness influence people's perceptions of the rival either negatively, by using a derogatory statement, or positively, by using a promotional statement. This suggests that judgments of facial attractiveness can be influenced by other's statements. Furthermore, the attractiveness of the derogator can also have a significant effect on the perceptions of the derogated individual; for men only, attractive women have more influence than unattractive women on the perceptions of rivals. This finding may be explained by the fact that men pay more attention to attractive females since they may be potential desirable mates, while women view all females as potential rivals and thus give them equal attention.

In addition to facial attractiveness, the style of clothing a potential rival is wearing may also provoke intrasexual competition. Using two studies, Vaillancourt and Sharma (2011) found support for the notion that style of clothing evokes derogating behaviours in women exposed to "sexy" (revealingly dressed) rivals. In the first study, 86 heterosexual women were randomly assigned to one of two experimental conditions. In the first condition, participants (n = 40) were exposed to an attractive conservatively dressed 21-year old Caucasian female confederate who displayed qualities considered attractive from an evolutionary perspective (low WHR, clear skin, large breasts) (conservative condition). In the second condition, participants (n = 46) were

exposed to the same female confederate, but this time she was dressed in a revealing manner (e.g., low cut top, short mini-skirt, long hair worn down) (revealingly dressed condition). Video clips of the participants' reactions to their exposure to the confederate were randomly presented to 13 women blind to condition, who classified and rated participants on two variables: (1) whether or not they thought the participant was exhibiting 'bitchy behaviour' (i.e., indirect aggression); and (2) if so, how 'bitchy' her reaction was on a scale from 0 (*not bitchy*) to 10 (*extremely bitchy*). Results indicated that participants in the sexy condition were more likely to roll their eyes at the confederate, look her up and down, stare at her without conveying any emotion, and show anger while she was in the room. When the confederate left the room, many of them laughed at her, ridiculed her appearance, or suggested that she was sexually available to the experimenter. In contrast, when the same confederate was dressed conservatively, the women in this condition greeted her in a friendly manner or did not even notice her, and none of them discussed her with the experimenter when she left the room. In the second study, Vaillancourt and Sharma examined whether the sexy confederate from the first study was viewed as a rival by women. Participants (n = 66) were randomly assigned to view one of three pictures, all of which were of the same confederate from the first study: (1) the confederate in conservative clothing (conservative condition); (2) the confederate in revealing clothing (revealing-thin condition); and (3) the confederate in that same revealing clothing manipulated to appear overweight (revealing-fat condition). In all three conditions, participants were asked to rate the depicted woman's level of attractiveness (e.g., cuteness), sexiness, how likely they would be to introduce her to their boyfriend (current or future), how likely they would be to let their boyfriend spend time alone with her, and how likely they would be friends with her. Results indicated that women rated the revealing-thin confederate as the sexiest of the women. They were also less likely to want to

introduce their boyfriend to the revealing-thin and revealing-fat confederates, have him spend time alone with them, or be friends with them than the conservative confederate, who was rated as being the most attractive (e.g., cute). These findings suggest that women are threatened by, or disapprove of, revealingly dressed women, possibly due to their appeal as additional or alternative ST partners for men.

As mentioned above, a low WHR (waist-to-hip ratio) of 0.7 for women is considered attractive, likely because it signals health and fertility due to high levels of estrogen that cause more fat to be deposited on the buttocks and hips than on the waist (Singh, 1993). Thus, it is likely that women will be more jealous of rivals with a lower WHR compared to rivals with a higher WHR. Indeed, research has indicated that middle-aged women (M_{age} = 48.4, SD_{age} = 9.2) are more jealous of rivals with a low as opposed to a high WHR, and judge rivals with a low WHR as more attractive than rivals with a high WHR (Buunk & Dijkstra, 2005). Furthermore, women who feel that they have a low WHR experience more jealousy in response to a low WHR rival than women who feel they have a high WHR, suggesting that women may engage in self-evaluation when competing with a rival for a potential mate (Buunk & Dijkstra, 2005). The study may also suggest that women are more threatened by rivals with similar strengths as their own (i.e., women using the same sexual strategy may be greater threats). In a similar study, Fink and colleagues (2014) found that simulated photographs of women with more feminine faces, larger breasts and lower WHRs received higher attractiveness and femininity ratings, and were ranked highest on rival competition by female undergraduate students. These results suggest that men's mate preferences influence rival competition in women.

Another line of research that has examined competitor derogation relating to self-evaluations involves comparing one's physical appearance to the appearances of others (i.e.,

social comparison), which is associated with the use of indirect aggression towards attractive targets (Arnocky et al., 2012). Examples of indirect aggression include talking about others behind their backs (i.e., gossiping), excluding others from a group, making other people not talk to others, being 'bitchy' toward others, and snubbing others in public. Using the Dieting Peer Competitiveness (DPC) scale as a measure of social comparison and the Indirect Aggression Scale-Aggressor (IAS-A) as a measure of indirect aggression, Arnocky and colleagues (2012) found that women with low body satisfaction made more frequent attractiveness comparisons and were more likely to engage in aggressive behaviours toward their peers. This suggests that women with low body satisfaction, which may relate to perceived low mate value, tend to use indirect aggression towards attractive peers as an intrasexual competitive strategy. The authors suggest that acts of indirect aggression aid in retaining access to a desirable mate by reducing the mate value of the rival. However, a limitation of the study is that mate value was not directly measured. Rather, mate value was inferred based on a comparison of one's own physical attractiveness to the attractiveness of intrasexual competitors using the Dieting Peer Competitiveness scale (Huon, Piira, Hayne, & Strong, 2002), where women reported on their tendency to compare their physical attractiveness to same-sex others Thus, it remains unclear whether actual mate value relates to the use of indirect aggression.

Relationship status may also relate to the use of intrasexual competitive strategies. For example, Fisher and Cox (2011) reported that women involved in romantic relationships (e.g., casually dating to LT partnerships) were more likely to use competitor derogation tactics than women who were single, and that they use these strategies more than they use the intrasexual competitive strategies of self-promotion and mate manipulation (e.g., establishing a common ground with the mate, expressing an interest in the mate, or treating them respectfully). The

authors measured intrasexual competition by creating the Intrasexual Competition Survey, which contains 24-items designed to assess engagement in four categories of intrasexual competition; self-promotion, competitor derogation, competitor manipulation, and mate manipulation. To explain the results of their study, Fisher and Cox suggested that people who are perceived to be rivals might be derogated as a way of helping maintain a romantic relationship. As well, they suggest that once one has a mate, it is no longer as important to self-promote given that the mate already knows about one's features. However, in a previous study, Fisher, Cox, and Gordon (2009) found that women who were in dating relationships used significantly more derogating tactics than married, common-law, or single women. The authors suggested that for women in dating relationships, which often consist of lower levels of commitment than marital or common-law relationships, derogation is one strategy used to try to maintain the current relationship by preventing a potential rival from infiltrating the relationship. Specifically, women in dating relationships would derogate the potential rival's genetic fitness and fertility in order to decrease their desirability as an extra-pair partner. Thus, when relationship status is more sensitively measured, it appears that those in less committed romantic relationships (e.g., dating relationships) are more likely to use competitor derogation tactics than those in more committed romantic relationships (e.g., LT, married, or common-law relationships). Nonetheless, both studies suggest the importance of measuring and either controlling for or examining the role of relationship status when examining competitor derogation behaviours.

Another form of intrasexual competition that is related to competitor derogation is competitor manipulation (Fisher & Cox, 2011). This strategy involves convincing one's rivals that they are not worthy of the potential mate or manoeuvring the attention of the competitor away from the desired mate toward an alternative mate. This could also involve indirectly

manipulating the competitor to appear less desirable in front of the desired mate, all of which increases the individual 's likelihood of success. As mentioned previously, the Intrasexual Competition Survey contains a category that assesses engagement in competitor manipulation. Sample items include, "try to make the rival feel really self-conscious", "tell the rival that they look fine when they do not, or recommend they wear something that I think makes them look unattractive", and "tell the rival that my mate is dumb or boring, and would not make a good mate for them". Items are answered along a 7-point Likert-type scale ranging from 1 (*definitely would not do*) to 7 (*definitely would do*). In a sample of 126 (93 women) heterosexual undergraduate participants, Fisher and Cox (2011) found that women equally use competitor derogation and competitor manipulation, but less so than self-promotion. The authors suggest that people want to appear desirable to a potential mate and thus may rely less on tactics that could lead them to seem mean-spirited, such as those used in competitor derogation or competitor manipulation. These may only be used as a last resort. However, despite some of the negative consequences that may ensue from the use of competitor derogation or competitor manipulation, women are still likely to use these strategies in order to increase their chances of competing against a rival in order to obtain a potential mate. The use of these strategies may be particularly important during periods of relatively higher fertility, since this is when women are most likely to benefit from reducing their competition (e.g., times of greatest likelihood of conception).

The Menstrual Cycle and Conception Likelihood.

Numerous studies have linked phase or day of the menstrual cycle to women's mating preferences and behaviours (e.g., Buss, 2005; Scarbrough & Johnston, 2005). The typical menstrual cycle length is between 21 and 35 days (e.g., Creinin, Keverline, & Meryn, 2004) with

most women having a cycle length of roughly 28 days. The cycle can be delineated into a number of longer or shorter phases but it is commonly broken down into four phases: menstrual, mid-follicular, periovulatory, and luteal (Havez, 1979). During the menstrual phase (often described as days 1 to 5), the uterus sheds the uterine lining which is a layer of blood-enriched tissue that is used to successfully establish pregnancy through implantation. During this phase, all levels of hormones are relatively low (i.e., estradiol, progesterone, luteinizing hormone [LH], and follicular-stimulating hormone [FSH]) (Carlson, 1991).

During the beginning of the second phase, the mid-follicular phase (days 6 to 12), estrogen and progesterone are still at their lowest (Havez, 1979). Later on in the phase, FSH and estrogen levels rise, while progesterone levels remain low. The rise in FSH causes a number of "ripe" ovarian follicles to begin maturing. Some research has suggested that the follicular phase can be divided into the early (days 1 to 4, including menstruation), mid (days 5 to 8) and late (days 8 to 14) follicular phases (e.g., Roberts et al., 2004). The mid-follicular phase is sometimes called the postmenstrual phase and is characterized by low levels of all hormones, except for estradial and FSH being slightly elevated. The late part of this phase (i.e., days 10 to 16) corresponds to the periovulatory phase of the cycle.

During the beginning of the third stage of the menstrual cycle, the periovulatory phase (typically between days 10 to 14 or 15), a rise in FSH occurs which triggers the follicle to begin secreting estradiol, which in turn inhibits the pituitary secretion of FSH. The follicle also stimulates other estrogens which signal the thickening of the uterine lining. Once the follicle is mature, it secretes enough estradiol to trigger the release of LH which matures the egg and weakens the wall of the ovary. There is then a FSH and estradiol surge, and ovulation occurs (Havez, 1979). Estradiol hits its peak level across the cycle during this phase. Ovulation occurs

16 to 30 hours after the LH surge. The ovum then travels down the fallopian tube where it may be fertilized. The periovulatory phase contains the menstrual cycle days of highest conception likelihood (Wilcox, Dunson, Weinberg, Trussell, & Baird, 2001).

Finally, the luteal phase (days 16 to 28), can be broken down into the early luteal phase (roughly days 16 to 19), the mid-luteal phase (days 20 to 24), and the late luteal phase (days 25 to 28 or until menses). During the early luteal phase, estradiol falls to low-moderate levels and progesterone starts to rise. Progesterone peaks and plateaus at its highest levels (Speroff & Fritz, 2005) during the mid-luteal phase while estradiol rises slightly to moderate levels. Progesterone stimulates a blanket of blood vessels to prepare for egg implantation. If no fertilization occurs, hormone secretions break down the lining of the endometrium resulting in menstruation during the menstrual phase (Hock, 2007). This process occurs towards the end of the luteal phase, with the drop in progesterone and estradiol during the late-luteal phase signalling the beginning of menstruation and the reoccurrence of the cycle. During the entire luteal phase, LH and FSH are at low levels (Havez, 1979).

Alliende (2002) conducted a study to measure the hormone profiles of normal cycling women. Immunoassays were collected daily from 78 free-cycling women for estrone glucuronide, LH, and pregnanediol glucuronide, which have all been found to fluctuate throughout the menstrual cycle. Alliende reported that all of the women's cycles showed an ovulatory pattern configuring classic hormonal mean curves with hormone level peaks within cycle days 11 to 23: estrone glucuronide (mean cycle day was 14.5 using the forward count method), LH (mean cycle day was 16), and pregnanediol glucuronide (mean cycle day was 17). As discussed below, the likelihood of conception is highest during the periovulatory phase

around the time when estradiol and LH are highest, decreases during the luteal and menstrual phases, and gradually increases again during the mid-follicular phase (Hock, 2007).

With conception likelihood being highest during the periovulatory phase, researchers have estimated that conception probability following a single act of intercourse is 0.04, 0.13, 0.08, 0.29, 0.27, and 0.08 for the six consecutive days ending with ovulation in women who experience regular menstrual cycles (Wilcox et al., 2001). Thus, conception likelihood is highest on the two days prior to the day of ovulation (the preovulatory period). Outside of this six day conception window, probability of conceiving is less than .01. However, on any given day, Wilcox and colleagues estimated that there is a 3.1% likelihood of conception for free cycling women who report regular menstrual cycles. Furthermore, the probability of conception is somewhat unlikely during the first three days of the cycle, but by day seven, the likelihood of pregnancy rises to 2%. Wilcox and colleagues (2001) reported that conception likelihood peaks on day 13 (forward count) of the cycle at 8.6% and declines thereafter but remains at around 1% in a combined sample of women who experience regular or irregular cycles. Women with regular cycles experienced a 9.3% likelihood of conception on day 13 while women with irregular cycles experienced a 4.5% likelihood on the same day. Women with irregular cycles experience later and more irregular ovulation, with their peak probability of pregnancy occurring later in their cycle (i.e., days 16 and 17 with a conception likelihood of 6.5%).

There are numerous counting methods that have been used in detecting menstrual cycle phase. The most commonly used method is that of Jöchle (1973), which estimates probabilities of conception based on the participant's cycle day. There are two ways in which the counting method is used, the forward count method and the backward count method. The forward count method uses the start date of a woman's last period to estimate the day of ovulation (e.g., Penton-

Voak et al., 1999; Pillsworth, Haselton, & Buss, 2004), with day 1 being the first day of bleeding. The backward count method adjusts for variability in menstrual cycle length which allows for an estimation of conception probability, and possibly hormone levels, independent of cycle length. The backward count method uses the onset of a woman's estimated next period to approximate cycle day and predict the day of ovulation. The backwards count method involves using the following formula to determine the length of the follicular phase: F = L - 14, where F is the last day of the follicular phase and L is the length of the cycle. The day before the first day of menstruation is then denoted as day -1 and a backwards count is used to determine cycle day. The backward count is considered more accurate when attempting to estimate ovulation or the time of highest conception likelihood since most of the variation in cycle length occurs due to variation in the follicular phase. However, the forward count method is best for estimating cycle days in the first half of the menstrual cycle and is particularly useful given that published data on conception likelihood estimates exist for forward count cycle days (e.g., Wilcox et al., 2001). The advantage to the counting methods is that it is fairly easy and non-invasive. As long as women note the start days of menstruation, one can use one of the counting formulas to reach an approximate day of ovulation and to determine their cycle day.

One recent meta-analysis has indicated that women tend to value attractive men as ST partners most when they are most fertile (Gildersleeve et al., 2014). However, another recent meta-analysis found a lack of support for cyclic changes in women's mate preferences (Wood, Kressel, Joshi, & Louie, 2014). The latter authors suggested that the few significant preference shifts that have been found may be due to research artifacts or publication biases, and broad and less precise measurements of fertility statuses. Nonetheless, research has indicated that women experience other behavioural (e.g., Haselton & Gangestad, 2006; Haselton et al., 2007; Roder,

Brewer, & Fink, 2009; Schwarz & Hassebrauck, 2008) and physical (e.g., Gildersleeve, Haselton, Larson, & Pillsworth 2012; Havlicek et al., 2008; Kuukasjarvi et al., 2004; Puts et al., 2013; Roberts et al., 2004) changes across the menstrual cycle that reflect evolutionary adaptations, with intrasexual competition being one of them (e.g., Fisher, 2004).

Cyclic shifts in competitor derogation. Studies have found that women's use of competitor derogation tactics may change as a function of fertility status. For example, using a between-subjects design, Fisher (2004) found that women who were in the fertile phase (i.e., ovulatory phase) rated female facial attractiveness (rated along a 7-point Likert type scale from 1, *extremely unattractive* to 7 *extremely attractive*) significantly lower than women who were in the nonfertile phases (i.e., luteal and menstrual phases). This shift was not evident for ratings of male facial attractiveness. This may suggest that intrasexual competition in the form of competitor derogation (e.g., observers reporting that other women are less attractive) may increase during times of peak fertility. Fisher suggested that since women compete intrasexually for good mates via attractiveness (since physical attractiveness is desired by men), it would be advantageous to have heightened levels of competition during times critical for reproduction. However, it is also possible that the shift in women's perception of other women's attractiveness has evolved as a byproduct of their preference for masculine faces during phases of heightened fertility. Research has indicated that women prefer masculinity in faces when they are more fertile (Johnston, Hagel, Franklin, Fink, & Grammer, 2001; Jones et al., 2005; Penton-Voak et al., 1999; Welling et al., 2007) while preferences for feminine faces (i.e., attractive, Perrett et al., 1998) decrease around ovulation (Jones et al., 2005). Thus, it is possible that the increased preference for masculine faces and decreased preference for feminine faces at ovulation may explain why women find other women less attractive during this time.

Another study that reported associations between fertility status in women and their perception of other women was conducted by Vukovic and colleagues (2009). The researchers found that postmenopausal women were more likely to choose feminine female faces than pre-menopausal women as being attractive, which supports the proposal that derogation of attractive same-sex competitors is more pronounced when fertility is high (Fisher, 2004; Jones et al., 2005; Welling et al., 2007). To explain this finding, Vukovic and colleagues suggested that postmenopausal women may have less to gain from derogating same-sex rivals since they can no longer conceive, therefore, they may be less likely to use such tactics (either implicitly or explicitly). Taken together, the findings from Fisher (2004) and Vukovic and colleagues suggest that women rate other women and more feminine women as less attractive during periods of higher fertility, which may reflect evolved mechanisms of competitor derogation or byproducts of preferences for masculinity in human faces. It should be noted that Fisher (2004) examined female intrasexual competition with respect to attractiveness and asked women to rate the facial attractiveness of photographed female and males faces. Vukovic examined within-sex competition as measured by preferences for femininity in female faces by having women identify which face in a pair of face images they consider more attractive. Each pair consisted of a masculinized and a feminized version of the same individual. Thus, within both studies competitor derogation was indicated by lower attractiveness ratings, which the authors used as an indication of competition. These appear to be the only two studies to have examined fertility related changes in ratings of attractiveness. In addition to both of these studies using between-subjects designs, these studies may not have fully captured the concept of competitor derogation as perceiving a rival's attractiveness is only one of a number of competitor derogation tactics. Furthermore, a study where women share their opinions aloud or to a potential mate would

provide a more accurate or ecologically valid method of using ratings of attractiveness as an indicator of competitor derogation. While these two studies do suggest that ovulating women may evaluate other women as less attractive and that fertile women may view less feminine women as more attractive, additional research is needed to both replicate the findings and to better understand if and how this may relate to competitor derogation.

Other research has found that women's use of competitor derogation tactics does not change as a function of natural fertility status (e.g., Cobey, Kippling, & Buunk, 2013). For example, Cobey and colleagues used a within-subjects design, and had 28 women complete the Scale for Intrasexual Competition (Buunk & Fisher, 2009) three times: when using hormonal contraceptives (HCs), when more fertile, and when less fertile. The Scale for Intrasexual Competition used 12 items, rating along a 7-point Likert-type scale (from *not at all applicable to me* to *completely applicable to me*) to assess individual differences in intrasexual competition. Examples of scale items include, "I want to be just a little better than other women." and "I tend to look for negative characteristics in women who are very successful". The authors found that, for pair-bonded women only (n = 14), HC use (which lowers testosterone levels) was associated with lower levels of intrasexual competition than regularly cycling fertile and non-fertile phases. The authors suggested that intrasexual competition may function differently in single versus pair-bonded women, such that single women may be less influenced by decreases in testosterone during HC use because the cost of not competing for a mate is higher as the desire to obtain a mate overrides the potential effects of contraceptive use. Related to this, Hahn, Fisher, Cobey, Debruine, and Jones (2016) found a positive within-subject effect of testosterone on intrasexual competitiveness, indicating that women reported greater intrasexual competitiveness when testosterone was high. Conversely, there were no significant effects of estradiol, progesterone,

estradiol-to-progesterone ratio, or cortisol. The researchers asked 136 heterosexual free-cycling women to complete Buunk and Fisher's (2009) Scale for Intrasexual Competition at five consecutive weekly test sessions where saliva samples were collected. These results complement Cobey et al.'s (2013) suggestion that reported intrasexual competitiveness varies as a function of women's testosterone level (i.e., HC use, which lowers testosterone, was associated with lower intrasexual competitiveness).

Cobey et al. (2013) also found that when regularly cycling, for both single and pair-bonded women, there was no significant difference in levels of intrasexual competition when more versus less fertile. This finding contrasts with the findings reported by Fisher (2004). However, it is possible that Fisher's between-subjects study design resulted in subtle group differences or that the difference in ratings of photograph attractiveness did not reflect intrasexual competition. Moreover, physical attractiveness is only one of a number of dimensions on which women may compete intrasexually. Since Cobey and colleagues used a scale to measure intrasexual competition and that scale included several domains in which competition may occur, their results are not specific to competition in the arena of physical attractiveness. However, the scale does not specifically measure competitor derogation, but rather intrasexual competition as a whole. Also, the scale used examines intrasexual competition more as a trait as opposed to a state. Thus, it is still possible that using a self-report measure is less sensitive to state-related changes in tactics or the use of such a measure in combination with visual primes of potential rivals would be a more powerful design in order to determine whether the use of such strategies change as a function of fertility status.

As mentioned previously, rival evoked jealousy may lead to, may occur due to, or as a part of intrasexual competition. In line with this reasoning, Cobey and colleagues (2012) used a

within-subjects study design and found that when women were fertile (i.e., not taking hormonal contraceptives), they experienced more relationship-related jealousy (e.g., concerns that one's partner finds someone else more attractive, thinking that it is unacceptable for one's partner to have friends of the opposite sex) relative to when they were non-fertile. The authors suggested that women may find themselves feeling more jealous when fertility is relatively higher because mating competition is most salient at this time, and they may, therefore, monitor their partner to a greater extent. Though the authors did not assess the use of intrasexual competitive strategies, it is possible that rival evoked jealousy leads to engagement in competitor derogation or negative perceptions of potential rivals when more fertile since this period reflects a time when such strategies would have the lowest risk-to-benefit ratio.

Interestingly, both male and female observers rate photos of women as trying harder to appear more attractive in the fertile as compared to the non-fertile phase of the menstrual cycle (Haselton et al., 2007). This may be important for intrasexual competition as it may enhance one's physical appearance relative to a potential rival's, and may act as a cue to a potential rival's fertility status. As well, Durante, Li, and Haselton (2008) found shifts in women's clothing choice related to fertility status, with women showing greater preference for revealing clothing near ovulation. The authors suggested that the shift in clothing preference may reflect an increase in intrasexual competition near ovulation. However, it is also possible that it reflects an increase in desire to attract a mate. Indeed, previous research has shown that women are more jealous and give lower attractiveness ratings to potential rivals (Buss & Dedden,1990), and that women are rated as less attractive in the fertile phase of the menstrual cycle (Fisher, 2004). This pattern of behaviour may have adaptive value as an intrasexual competitive strategy aimed at targeting a potential rival when one is fertile since it is the most critical period for conception.

However, the effect reported by Fisher (2004) could also be a by-product of a self-comparison and an increase in one's perception of one's own attractiveness on days near ovulation rather than perceiving other women as competitors or less attractive. The finding may also reflect an increased level of critical evaluation by fertile women, such that they are able to more accurately evaluate potential rivals (Fisher & Cox, 2009). The ability to compare a potential rival to oneself could have significant implications for the assessment of mate value and intrasexual competition. For example, a woman might want to indirectly influence a potential mate by leading him to think negatively about a rival or she might wish to derogate a rival for the purposes of increasing one's own self-esteem. In addition, a woman might be attempting to influence a potential rival by leading the rival to believe she should not compete, or that she will lose because she is not as attractive as the derogator. Research has indicated that women experience higher levels of jealousy in general during the ovulatory phase (Krug, Finn, Pietrowsky, Fehm, & Born, 1996). Thus, women may perceive other women as less attractive when the perceiving woman is more fertile and jealousy may function as a mechanism to drive this perceptual effect. Such an effect would provide evidence of greater intrasexual competition at higher fertile periods of the menstrual cycle.

Current Studies

As mentioned above, one's clothing choice can influence perceptions and judgments of people's personalities and behaviour. The goal of Study 1 was to examine perceptions and biases about revealingly dressed women and whether such biases reflect mating-relevant adaptations for groups of women. Thus, Study 1 also examined whether mating relevant individual difference characteristics of observers (e.g., STMO, relationship status, hormonal contraceptive use) were associated with the extent to which they hold stronger biases about revealing dress, or the extent

to which they view revealing dress as more negative. In addition, a purpose of Study 1 was to provide evidence of the validity of the photographic stimuli for assessing revealing dress biases and for assessing women's perception of potential rivals. Given that past research suggests that revealingly dressed women are perceived as more promiscuous and as greater mating rival threats, a goal of Study 1 was to provide evidence for the validity of using the low versus high revealingly dressed photographic stimuli as low versus high threat rivals to examine whether women's evaluations of these potential rivals shift with changes in fertility in Study 2.

As well as examining the role of individual difference variables in the perception of women based on their style of dress (Study 1), the dissertation also examined how shifts in conception likelihood or fertility across the menstrual cycle affects women's perception of other women (e.g., potential rivals) (Study 2). Previous research has indicated that women perceive other women as less attractive when the perceiver is at a higher rather than lower fertility phase of the menstrual cycle (e.g., Fisher, 2004), as well as in premenopausal versus post-menopausal women (e.g., Vukovic et al., 2009). These findings have led to the suggestion that this may reflect a competitor derogation strategy (Fisher, 2004; Vukovic et al., 2009). Research has also found that women perceive other women more negatively when they are dressed in a revealing manner as compared to women who are dressed in a less revealing manner (e.g., Vaillancourt & Sharma, 2011). Thus, biases about revealing dress may reflect evolved mechanisms for women with particular mating strategies to maximize their chances of mating success. However, previous research has yet to examine whether women's mating orientations (e.g., STMO) or fertility influence women's perceptions of revealingly dressed women. As such, the overarching goal of the current project was to examine women's perceptions of other women as a function of self-presentation style (revealing versus nonrevealing clothing) and mating strategies.

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Chapter 2: Study 1

Biases and Individual Differences in Women's Perceptions of Revealing Dress

Abstract

Previous research has examined perceptions of revealing dress from the perspective of objectification or attribution theories. Evolutionary theories have not yet been formally used to examine why individuals perceive and judge women who dress revealingly more harshly than women who dress in a less revealing manner. The goal of the present study was to further characterize biases associated with revealing dress and to examine how observer characteristics are associated with the strength of these biases. Women (N = 341) evaluated photographed women dressed in low and high revealing clothing and judged the more revealingly dressed women to be more attractive, feminine, promiscuous, and flirtatious; and less trustworthy, nice, and intelligent. In addition, women were less interested in being friends with revealingly dressed women, were more jealous of revealingly dressed women, reported that their partners would be more attracted to revealingly dressed women, and rated themselves as less attractive relative to revealingly dressed women in comparison to identical women dressed in a less revealing way. The findings suggested at least 11 revealing dress biases. Sexual orientation, sociosexuality, long-term mating orientation, body-esteem, relationship status, virginity status, and hormonal contraceptive use were all associated with specific revealing dress biases. In addition, compared to women with low short-term mating orientation, women with high short-term mating orientation showed more of the attractiveness revealing dress bias; and less of the promiscuous, untrustworthy, not-nice, unintelligent, non-friend, flirtatious, and 'negative' revealing dress biases. These results suggest that women's mating-relevant characteristics are associated with their perceptions of women in revealing dress. Results are discussed from an evolutionary perspective.

Biases and Individual Differences in Women's Perceptions of Revealing Dress

Past research has indicated that women who wear revealing clothing are judged more negatively; and as more sexually appealing, more attractive, less faithful in marriage, more likely to engage in sexual teasing, more likely to use sex for personal gain, and more likely to be sexually experienced than women who wear less revealing clothing (Cahoon & Edmonds, 1987; Edmonds & Cahoon, 1986). Additionally, women who wear little or extremely tight clothing are perceived as being promiscuous (Gurung & Chrouser, 2007) and less competent (Nezlek, Krohn, Wilson, & Maruskin, 2015). These biases have been found in both women and men (Abbey, 1987). The majority of researchers who have examined this issue have explored it from a social perspective and have discussed the findings in the context of objectification theory (e.g., Daniels & Zurbriggen, 2016; Graff, Murnen, & Smolak, 2012; Gurung & Chrouser, 2007; Holland & Haslam, 2013; Nezlek et al., 2015; Tiggemann & Andrew, 2012) and attribution theories (e.g., McLeod, 2010). Some studies have examined individual difference variables associated with these biases (Gurung & Chrouser, 2007) and have found that women's own levels of social physique anxiety (i.e., anxiety in response to others' evaluations of one's physique) are associated with having stronger biases. No previous studies appear to have examined these biases from an evolutionary perspective or examined whether there may be evolutionary explanations for the existence of such biases. These biases may have been selected for because they were adaptive for people with particular mating orientations or mating strategies. For example, women may hold these biases if it helps them accurately identify potential mating rivals who they can defend against. The goal of the present paper is to examine revealing dress biases from an evolutionary perspective in order to determine whether women with particular mating strategies are more or less likely to endorse particular perceptions of revealing dress

In this study, revealing dress refers to tighter and more body/skin-showing apparel, while non-revealing dress refers to looser and less body/skin-showing apparel. It should be noted that the term "provocative" has most commonly been used in previous research to describe body revealing styles of dress. However, the term provocative can carry negative connotations, judgements, assumptions and biases about what is implied when a woman wears revealing clothing (e.g., interest in ST sexual relationships, openness to sexual offers and sexual receptivity, promiscuity). As the purpose of the current paper is to better understand people's perceptions of revealing dress and the term 'provocative' inherently carries a value judgement, the term 'revealing' is used here instead.

Abbey, Cozzarelli, McLaughlin, and Harnish (1987) examined whether women's sexual intent and interest, as conveyed by revealing clothing, was misinterpreted by men. The authors developed two dress conditions using pictures of different women: (1) revealing (e.g., slit in skirt, low cut blouse, high heeled shoes); and (2) non-revealing (e.g., skirt without a slit, blouse buttoned to neck, boots). Men rated the two sets of photos on a series of attributes. As compared to non-revealing clothing, women wearing revealing clothing were rated significantly more flirtatious, sexy, seductive, promiscuous, sophisticated, assertive, and both less sincere and considerate. In another study, Graff and colleagues (2012) manipulated the clothing of an adolescent girl using three conditions: (1) "childlike" (a grey t-shirt, jeans, and black Mary Jane shoes); (2) "ambiguously sexualized" (leopard print dress of moderate length); and (3) "highly sexualized" (short dress, leopard print cardigan). In the highly sexualized condition, undergraduate students rated the girl as less moral, self-respecting, capable, determined, competent, and intelligent than when she was depicted in either the childlike or the ambiguously sexualized conditions.

Researchers have also indicated that high revealingly attired women are more objectified. For example, Gurung and Chrouser (2007) had female undergraduate students rate three photographs of female Olympic athletes shown in either highly revealing or sport-appropriate outfits. The women pictured in the highly revealing condition were rated as significantly more attractive, sexually experienced, feminine, and desirable; and less capable, strong, determined, and intelligent. In addition, participants' own levels of social physique anxiety (i.e., anxiety in response to others' evaluations of one's physique) was a significant predictor of these biases. Related to this, Daniels and Zurbriggen (2016) found that women overall rated "sexualized" Facebook profile photos as less socially attractive (e.g., as a friend) than "nonsexualized" Facebook profile photos. They also found that young adult women (aged 17 to 25) rated sexualized photos as more socially attractive in comparison to adolescent girls (aged 13 to 18). However, the researchers did not examine whether other individual difference variables (e.g., STMO) were associated with these perceptions. Taken together, two studies have examined whether characteristics of female perceivers predict the objectification of revealingly dressed women (i.e., Daniels & Zurbriggen, 2012; Gurung & Chrouser, 2007), however mating-relevant characteristics of the perceivers have not yet been examined.

Past studies have not examined whether women's mating strategies are associated with their perception of women in revealing dress. While research indicates that individuals can accurately judge the sociosexuality of others based on photographs alone (Boothroyd et al., 2008; Boothroyd et al., 2011; Gangestad, Simpson, DiGeronimo, & Bick, 1992), it is not clear whether one's dress is used in this determination. Sacco Hugenberg, and Sefcek (2009) have suggested that sexual unrestrictedness (or having a higher STMO) may cause or lead to enhanced sensitivity to perceive reproductively relevant signals in female faces. While more research is

needed on the direction of any association between STMO and the perception of mating-relevant signals in other women, their suggestion fits with research indicating that women's STMO is associated with their mating-relevant perception of both men and women. One study found that women with a higher short-term mating orientation (STMO) showed a greater preference for men with larger pupil size (Caryl et al., 2009). Another study found that the female perceiver's sociosexuality was associated with perceptions of facial symmetry (i.e., a cue to genetic fitness) and of women's sexual receptivity (Sacco, Hugenberg, & Sefcek, 2009). Most relevant are the findings of Sacco and colleagues (2009) who found that sexually unrestricted women were more sensitive to perceiving symmetry (i.e., genetic fitness) and genuine smiles (i.e., signals of approach and sexual receptivity) in female faces than were restricted women.

Whether an association between STMO and the perception of reproductively relevant signals in female faces is due to genetics or experience, the findings suggest that such enhanced perceptual acuity may be more important to the strategy of high STMO women when competing for mates. It could be similarly adaptive for a subgroup of women to hold stronger biases about revealingly dressed women as this may activate their competitive motivation to attain or retain a mate and enhance their ability to identify their competitors or rivals. One hypothesis is that low STMO women hold greater negative revealing dress biases as more restricted women likely have more time invested in their relationships, fewer alternative mating options that they are nurturing, and more to lose if they do not recognize and act to counteract the potential threat of a high STMO rival. Holding negative biases about revealingly dressed women might have been adaptive for low STMO women as it may have helped them more quickly meet their threshold for engagement in mate guarding behaviours.

Past research suggests that revealing dress affects how women are perceived and judged. The objective of Study 1 was to investigate the perceptions of women's personal attributes (e.g., intelligence, niceness, promiscuity, interest in friendship, negative impressions, and feelings of jealousy) based on clothing choices, and to examine whether women with particular mating strategies are more or less likely to endorse particular revealing dress biases. Knowing what individual factors are associating with holding certain biases can be a step towards educating people about, and eliminating, biases. It was hypothesized that women will perceive other women who dress revealingly as more attractive, yet view them more negatively (i.e., more promiscuous, flirtatious, and feminine; less trustworthy, nice, and intelligent; report more of a jealous emotional response towards them; rate that their partner would be more attracted to them; and rate themselves as less attractive than them), as compared to less revealingly dressed women (Hypothesis 1); and that women's STMO will be associated with the extent to which they hold these revealing dress biases (Hypothesis 2). An additional goal of the current study was to provide evidence of the validity of the photographic stimuli in reflecting high versus low revealing dress, as these photographs will be used in an additional study to further examine women's perceptions of potential rivals.

Method

Participants

Participants were recruited to participate in a study examining perceptions of women ("The Perceptions of Women Study"). Initial study volunteers included 891 women aged 16 and over (M_{age} = 20.91, SD_{age} = 4.92, 82.0% Caucasian). Women were recruited from a Canadian university, the local community, and through the Internet. The recruitment process included posters displayed across the university campus, class-wide e-mails, in-class announcements, and

online advertisements on social networking websites (e.g., www.facebook.com), classifieds websites (e.g., www.kijiji.com), and psychological research websites. There were no initial inclusion or exclusion criteria other than the lower age limit.

In order to focus on a more homogenous reproductive-aged population (see Table 2.1 for participant demographics) the following exclusion criteria were applied after data collection: (a) older than 44 years of age (due to the potential hormonal changes associated with menopause) (n = 9); (b) current or possible pregnancy (n = 9); (c) current lactation (n = 5); (d) menopausal (n = 15); (e) taking anti-psychotic medication (n = 2), (f) taking hormone replacement therapy medication (n = 4), and (g) taking thyroid medication (n = 6). Some women may be accounted for more than once within the previous exclusion criteria. After exclusion criteria were applied and participants with incomplete data were excluded, 371 women remained for inclusion in the analyses.

In addition to the above main sample of women, additional exclusion criteria were applied to examine the hypotheses within a heterosexual sample of women not using hormonal contraceptives (i.e., a free-cycling population). The additional exclusion criteria for the free-cycling sample were: (a) a score of four or higher on the Kinsey (1974) Heterosexual-Homosexual Rating Scale (i.e., indicating equal heterosexuality and homosexuality or greater homosexuality than heterosexuality) (n = 31); and (b) current hormonal contraceptive (HC) users (n = 201). The decision to include only women who reported a greater interest in the opposite sex and who were free-cycling was made given that a goal of the study was to examine perceptions of women's dress from an evolutionary perspective and both homosexual orientation and HC use may affect one's mating strategy and introduce additional variance.

Table 2.1

Demographics of All Women and Heterosexual Free-Cyclers

	All Women (n = 371)		Heterosexual Free-Cyclers (n = 214)	
	Mean	*SD*	Mean	*SD*
Age	20.30	3.53	21.07	4.52
SOI	52.79	33.89	49.10	52.45
STMO	31.77	14.77	29.05	15.42
LTMO	43.06	7.36	42.60	7.60
	Frequency	Percentage	Frequency	Percentage
Ethnicity				
Caucasian/European	333	89.8	179	79.9
Other	38	10.2	35	20.1
Kinsey Scale				
1 - Predominantly heterosexual	269	72.9	165	77.1
2	52	14.1	33	15.4
3	17	4.6	16	7.5
4 - Equally heterosexual and homosexual	10	4.6	-	-
5	2	0.5	-	-
6	6	1.6	-	-
7 - Exclusively homosexual	13	3.5	-	-
Relationship Status				
Partnered	166	44.7	84	39.3
Single	202	55.3	130	60.7
Education				
Some high school	1	0.3	-	-
Completed high school*	92	24.8	47	22.0
Some post-secondary	258	69.5	147	68.7
University graduates	22	5.6	20	9.3
Hormonal Contraceptive Use				
Current users	201	54.3	-	-
Never users	112	30.3	130	60.7
Previous users	57	15.4	84	39.3

Note. SOI = Sociosexuality Inventory (Simpson & Gangestad, 1991); STMO = Short-Term Mating Orientation (Jackson & Kirkpatrick, 2007); LTMO = Long-Term Mating Orientation (Jackson & Kirkpatrick, 2007); Kinsey = Kinsey Heterosexual-Homosexual Rating Scale (Kinsey, 1974); HC = Hormonal Contraceptives
*Many of these participants were likely first year university students

In addition to these two samples of women (i.e., the larger inclusive group of women, and free-cycling women who reported a preference towards men), two more samples of women were examined for exploratory and inclusivity purposes: (1) predominantly homosexual women [i.e., those scoring five or higher on the Kinsey (1974) Heterosexual-Homosexual Rating Scale] (n = 31); and (2) predominantly heterosexual women (i.e., women indicating that they are predominantly heterosexual and incidentally homosexual) (n = 340). As results from these latter two additional groups of women showed similar findings to that of the two groups mentioned previously, only results from the first two samples are reported here.

Materials and Measures

Background Questionnaire. The Background Questionnaire, included information regarding demographics (e.g., sex, age, years of education, ethnicity, relationship status, self-perceived attractiveness, style of dress, and the Kinsey (1974) Heterosexual Homosexual Rating Scale) (see Appendix A); as well as the Sexual History Questionnaire (see Appendix B), which contained items regarding general sexuality status and history. Many of these items and questions were ones that have been developed within our laboratory for previous studies. The present study also included five main scales/measures that are described further below: the Perception of Women Measure (see Appendix C), the Multidimensional SOI (MDSOI) (Jackson & Kirkpatrick, 2007), the Self-Perceived Mating Success scale (SPMS) (Landolt, Lalumiere, & Quinsey, 1995), the Body Esteem Scale (BES) (Franzoi & Shields, 1984), and the Marlowe-Crown Social Desirability scale Short Form (MCSD-S) (Strahan & Gerbasi, 1972).

The Perception of Women Measure. The Perception of Women Measure (see Appendix C) was developed for the purpose of the current project to measure how women who differ in terms of levels of revealing dress (i.e., low versus high) are perceived. The measure was used in

combination with photographs of attractive women that participants evaluated. Here, the women completed the measure in order to examine how women evaluate other women who could be potential rivals. The Perception of Women Measure contained two question formats; a forced-choice format and a Likert-type format.

The forced-choice format involved presenting participants with 25 pairs of photographs of women (i.e., 50 photographs total) who would likely be considered attractive by conventional North American social standards (e.g., fashion models wearing trendy and fashionable clothing). Mean attractiveness ratings across all photos was 6.16 (*SD* = 1.53) on a scale of 1 to 10. Each pair consisted of one photograph of an attractive woman dressed in a less revealing manner (e.g., less revealing clothing that showed little skin and was less body conforming) and another photograph of the same attractive woman dressed in a more revealing manner (e.g., highly revealing clothing that was tight, body conforming and skin revealing). The photographs were downloaded from online clothing retail stores for non-profit educational and research purposes, and thus do not infringe on copyright issues. Similar to Welling and colleagues (2008), the forced-choice format asked women questions using an 8-point Likert-type scale. The questions we used were: (1) which woman do you find more attractive (i.e., photograph of less revealingly dressed woman "1 - *much more attractive*" to photograph of high revealingly dressed woman "8 - *much more attractive*"); (2) which woman are you more interested in being friends with (i.e., photograph of less revealingly dressed woman "1 - *much more interested in being friends with*" to photograph of a high revealingly dressed woman "8 - *much more interested in being friends with*"); (3) which woman would you be more jealous of if the woman was talking to your partner (current or future partner) (i.e., photograph of less revealingly dressed woman "1 - *much more jealous of*" to photograph of a high revealingly dressed woman "8 - *much more jealous of*"); and

(4) which woman do you view more negatively (i.e., photograph of less revealingly dressed woman "1 - *much more negatively*" to photograph of a high revealingly dressed woman "8 - *much more negatively*"). These four items were used to calculate the forced-choice revealing dress (RD) scores across the 25 pairs of photographs.

After completing the forced-choice questions, women rated each of the photographs used in the previous condition (i.e., 50 photos of 25 women) based on 11 attributes using a 10-point Likert-type scale, ranging from 1 (*not at all*) to 10 (*extremely*). Women were asked to rate each photograph for the following: (1) attractiveness; (2) trustworthiness; (3) femininity; (4) promiscuity (e.g., her interest in casual sex); (5) niceness; (6) intelligence; (7) interest in being friends with the woman; (8) how jealous you would feel if the woman were to talk to your partner (current or future); (9) how attracted you think your partner (current or future) would be to the woman; and (10) how flirtatious you think the woman would act towards your partner (current or future). Women were also asked to rate how attractive they think the photographed woman is in comparison to themselves (1 [*she is much more attractive than me*] to 10 [*I am much more attractive than her]*). These 11 questions made up the Likert-type rating subscale of the measure and were used to calculate mean Likert-rating scores and Likert RD difference scores for the 50 photographs (see below).

Multidimensional SOI. The Multidimensional SOI (MDSOI) (Jackson & Kirkpatrick, 2007) was used to assess mating psychology and behaviour with regards to short- and long-term mating orientation. This sociosexuality inventory includes two subscales that measure long-term mating orientation (LTMO) and STMO, with individuals being able to score either low or high on both, or high and low on either. The scale includes seven items from the original SOI (Simpson & Gangestad, 1991), five items from the Interest in Uncommitted Sex scale (Bailey et

al., 1994), a question about lifetime number of sexual partners, nine items used to assess attitudes towards long-term committed relationships, and three items used to assess short-term mating attitudes. Participants respond to the items using a 7-point Likert-type scale from 1 (*strongly disagree*) to 7 (*strongly agree*).

Past research suggests good internal consistency for the LTMO [i.e., a Cronbach's alpha of .95 in a sample of 328 participants (167 men)] and the STMO (i.e., a Cronbach's alpha of .88) scales (Jackson & Kirkpatrick, 2007). In the current study, the internal consistency for the LTMO was .85 (n = 583 women) and .93 for the STMO (n = 622 women). The LTMO and STMO scales are only modestly correlated, r = -.42, which supports the authors contention that the scales measure two distinct attitudes or mating strategies. The authors also examined correlations of the subscales with the original SOI and reported that only the STMO scale is significantly positively correlated with the SOI, suggesting that the original SOI only measures short-term sexual attitudes.

The Body Esteem Scale. The Body Esteem Scale (BES) (Franzoi & Shields, 1984) is a 35-item self-report measure indicating one's satisfaction with several parts of one's body. Items are rated on a 5-point Likert-type scale ranging from 1 (*strong negative feelings*) to 5 (*strong positive feelings*). The scale's items are divided into three subscales that differ slightly for men and women; physical attractiveness for men (11 items; e.g., nose, chin) or sexual attractiveness for women (13 items; e.g., lips, cheeks/cheekbones); upper body strength for men (9 items; e.g., muscular strength, body build) or weight concern for women (9 items; e.g., weight, figure/physique); and physical condition for both men and women (13 items; e.g., agility, physical coordination). Scores were summed within each subscale, with higher scores indicating

greater positive feelings about one's body. Coefficient alpha for the subscales ranges from .78 to .87 (Franzoi & Shields, 1984).

Research has suggested a positive relationship between women's self-perceived attractiveness and the use of competitor derogation tactics (e.g., Buunk & Dijkstra, 2005; Fisher et al., 2009). This may be due to attractive people being more prone to competition or wanting to seek out equally attractive mates, which necessitates increased competition.

The Self-Perceived Mating Success scale. The Self-Perceived Mating Success scale (Landolt et al., 1995) is an 8-item self-report measure used to examine how one perceives the reactions they receive from the opposite sex. Sample items include, "Members of the opposite sex that I like tend to like me back" and "I can have as many sexual partners as I choose". Items are rated on a 7-point Likert-type scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Scores are summed together, and can range from 8 to 56, with higher scores indicating a self-perception of higher mating success. Internal consistency for this scale has been found to be good (.83; Fisher, Cox, Bennett, & Gavric, 2008; Landolt et al., 1995). The scale requires one to understand how they would be assessed by the opposite sex as a mate, and thus, is considered to be a self-perceived measure of mate value (Fisher et al., 2008). It was included as an estimate of mate value.

MCSD-S. The MCSD-S (Marlowe-Crowne Social Desirability scale Short Form) (Strahan & Gerbasi, 1972) is a 10-item true or false scale that measures positive self-presentation and responding (e.g., I am always willing to admit it when I make a mistake), and was included as a measure of social desirability bias. Social desirability is the tendency of individuals to project favourable views of themselves that are consistent with social norms and expectations (Loo & Thorpe, 2000). The scale was included to ensure that individuals are truthful about their

behaviours and attitudes, and are not trying to present themselves as they wish to be seen. Since those who score higher on social desirability report using less competitor derogation tactics (e.g., Fisher et al., 2009), scores from the MCSD-S were used here as a covariate.

The MCSD has been reported to have good psychometric properties. The internal consistency of the full-length version of the MCSD was estimated to have a Cronbach's alpha of .72 in a sample of 232 Canadian men and women (Loo & Thorpe, 2000) and .86 to .84 for various short form versions (Fischer & Fisk, 1993). The MCSD-S that was used in the current study has been found to have adequate internal consistency (Cronbach's alpha = .79) and a high correlation with the standard 33-item original scale ($r = .96$, $p < .01$) in a sample of 390 Canadian university participants (Fischer & Fisk, 1993). In the current study, the internal consistency was .64 in a sample of heterosexual free cycling women ($n = 375$). Fischer and Fisk examined several short forms of the MCSD and concluded that the 10-item short form developed by Strahan and Gerbasi (1972) is the scale of choice due to its short length and good psychometric properties.

Procedure

Women accessed "The Perception of Women Study" and questionnaires online by clicking on an Internet link leading them to a secure SurveyMonkey website. An added precaution was used to enhance security and encrypt all responses (Secure Sockets Layer [SSL]). Following this, women were asked to read the electronic Online Cover Letter and Consent Form (see Appendix D). The full questionnaire took approximately 60 minutes to complete. The questionnaire was confidential but not initially anonymous as all participants were asked to provide an email address in order to be contacted for participation in a second session (as part of a larger study). An electronic or hardcopy Debriefing Form for the study was presented once the

participant completed the study (see Appendix E). University students enrolled in eligible psychology courses received up to two bonus points toward their course mark for participation (i.e., one bonus point for each session). The research project was approved by the University Research Ethics Board.

Three types of scores were computed for each woman to test the hypotheses: (1) mean Likert-rating scores for all 11 evaluations of the revealingly and non-revealingly dressed women in photographs (i.e., 22 means for each woman); (2) forced-choice revealing dress scores (mean score across all photos for each rating for each woman who completed the study; 100 scores per person due to the four items for 25 photograph pairs); and (3) Likert RD difference scores for all 11 evaluations of the revealingly and non-revealingly dressed women in photographs (i.e., 22 means for each woman). To calculate each of the Likert RD difference scores, each participant's Likert-rating score for the non-revealingly presented women was subtracted from their score for the revealingly presented women. Higher positive scores reflect having more of a tendency to ascribe that characteristic to, or having more of that feeling towards, the high revealingly dressed women; while lower negative scores represented more of a tendency to attribute the trait to, or have more of the feeling towards, the low revealingly dressed women. In total, 11 revealing dress (RD) scores were computed from the Likert-ratings: (1) attractiveness perception of RD; (2) trustworthy perception of RD; (3) feminine perception of RD; (4) promiscuity perception of RD; (5) nice perception of RD; (6) intelligent perception of RD; (7) friendship interest with RD; (8) jealous emotional response towards RD; (9) partner's attraction or potential mate rival perception of RD; (10) flirtatious perception of RD; and (11) relative attractiveness of RD (i.e., how attractive participants think the photographed women are in comparison to themselves). Difference scores between more and less revealingly dressed women were used in analyses (as

opposed to mean scores for the two groups) because difference scores are a more powerful way to focus on the differences between each set of paired photographs as opposed to the two groups of photographs as a whole. Use of difference scores enhances the ability to detect subtle differences in the perception of the two photographs of each woman and provides one score that reflects the RD bias.

Examination of Statistical Test Assumptions

Prior to analyses, the data were screened for errors at entry, missing values, and univariate outliers. As recommended by Tabachnick and Fidell (2007), scores that were three standard deviations above or below the mean were treated as outliers (i.e., $\pm z \geq 3.29$), and outliers were changed to one unit above or below the last score that was not an outlier.

Scatterplots were used to examine linearity of the relationships between the variables. Linearity appeared to be satisfactory. Skewness and kurtosis were calculated for each item rating and subscale by dividing the item statistic by the standard error. Items with a *z*-score above three were considered to be skewed or kurtosed (i.e., $\pm z \geq 3$) (Tabachnick & Fidell, 2007). Since the scales were only slightly skewed or kurtosed, transformations were not conducted. All other scales used to examine the hypotheses were not skewed or kurtosed (see Appendix F for more detailed information). For the main analyses, $p < .05$ was considered a significant effect.

Results

While two general hypotheses were tested, these involved testing the hypotheses that women evaluate revealingly dressed women as less trustworthy (untrustworthy perception of RD), nice (not-nice perception of RD), and intelligent (unintelligent perception of RD); to express less of an interest in friendship with revealingly dressed women (no-friendship interest with RD); and to rate oneself as less relatively attractive than revealingly dressed women

(relative attractiveness perception of RD); but to rate revealingly dressed women as more attractive (attractive perception of RD), feminine (feminine perception of RD), promiscuous (promiscuous perception of RD), and flirtatious (flirtatious perception of RD), to be more jealous of her (jealous emotional response towards RD), and to appraise one's partner as being more attracted to her (i.e., partner's attraction or potential mate rival perception of RD).

Hypothesis 1: Attractiveness and Revealing Dress Biases. It was predicted that women perceive other women who dress more revealingly as more attractive and feminine, yet judge them more negatively, than less revealingly dressed women. Thus, high versus low revealingly dressed women: will be judged as more promiscuous, flirtatious, and feminine; less trustworthy, nice, and intelligent; will arouse more of a jealous emotional response; will be perceived as being more attractive to one's partner (perceived mate rival); and will be evaluated as having a higher relative attractiveness to oneself.

Paired-samples *t*-test were conducted to compare the mean Likert-rating scores for the two styles of dress (highly revealing and less revealing) (see Table 2.2 for means, standard deviations, and *t*-tests). Within the overall sample of women, the results supported the hypothesis in that high revealingly dressed women were viewed as more attractive, feminine, promiscuous, and flirtatious; and less trustworthy, nice, and intelligent than less revealingly dressed women. In addition, women were less interested in befriending, had more of a jealous emotional response towards, reported that their partners would be more attracted to (i.e., mate rival perception), and rated themselves as relatively less attractive than high versus low revealingly dressed women. All group differences were highly significant ($p < .001$). The results were similar in the sample of heterosexual free-cyclers (see right panel of Table 2.2).

Table 2.2

Paired-Sample t-tests Comparing Mean Likert-Ratings of High Revealingly versus Low Revealingly Dressed Women in Two Samples of Women

	All Women (n = 371)					Heterosexual Free-Cyclers (n = 214)				
RD Bias	*M* (*SD*) Highly Revealing Dress	*M* (*SD*) Less Revealing Dress	*t*	*df*	*p*	*M* (*SD*) Highly Revealing Dress	*M* (*SD*) Less Revealing Dress	*t*	*df*	*p*
Attractiveness	6.42 (1.43)	6.14 (1.37)	6.35	370	< .001	6.25 (1.41)	6.05 (1.38)	2.90	152	.004
Trustworthiness	5.34 (1.46)	6.57 (1.19)	-19.84	355	< .001	5.31 (1.46)	6.44 (1.12)	-12.71	148	< .001
Femininity	7.01 (1.30)	6.55 (1.23)	10.79	343	< .001	6.94 (1.21)	6.40 (1.18)	8.05	142	< .001
Promiscuity	6.28 (1.57)	4.21 (1.62)	21.90	331	< .001	6.10 (1.40)	4.19 (1.43)	14.19	137	< .001
Nice	5.77 (1.35)	6.72 (1.19)	-17.14	326	< .001	5.75 (1.37)	6.59 (1.13)	-10.42	138	< .001
Intelligence	5.88 (1.36)	6.83 (1.17)	-16.77	330	< .001	5.89 (1.37)	6.69 (1.17)	-9.65	138	< .001
Friend	5.66 (1.32)	6.75 (1.18)	-18.79	323	< .001	5.65 (1.37)	6.60 (1.13)	-11.23	138	< .001
Jealous Response	6.01 (1.88)	5.02 (1.79)	19.66	354	< .001	5.70 (1.87)	4.80 (1.70)	11.48	151	< .001
Partner's Attraction[a]	5.77 (1.88)	5.01 (1.78)	17.71	331	< .001	5.41 (1.94)	4.78 (1.81)	9.52	138	< .001
Flirtatiousness	6.22 (1.70)	4.68 (1.59)	22.16	354	< .001	6.07 (1.67)	4.60 (1.46)	14.16	150	< .001
Relative Attractiveness[b]	3.84 (1.52)	4.39 (1.48)	-17.21	338	< .001	3.91 (1.66)	4.40 (1.61)	-10.16	136	< .001

Note. RD = revealing dress; Similar results were found in the group of homosexual women (n = 31) and the group of heterosexual women (n = 340).

[a] Partner's Attraction scores reflect the extent to which women felt that their partner would perceive the woman as attractive.

[b] Relative Attractiveness scores reflect how attractive women view themselves compared to the photos with lower scores reflecting lower relative evaluations of the self.

The results of the Likert-rating paired-sample *t*-tests were further supported by single sample *t*-tests using the forced-choice RD scores. Means were compared to the mid-point score (i.e., 4.5) of the 8-point forced-choice RD scores, as a score of 4.5 would reflect no bias towards either low or high revealing dress. Higher scores reflect a greater bias towards perceiving that the more revealingly dressed woman had more of the relevant trait. For all women, the mean ratings indicated that, in comparison to their evaluation of less revealingly dressed women, women evaluated high revealingly dressed women: (a) as more attractive [(M = 4.82, SD = 0.74), t(356) = 8.16, $p < .001$] and more negative [(M = 5.44, SD = 0.65), t(358) = 27.45, $p < .001$]; (b) as less interesting as potential friends [(M = 3.60, SD = 0.78), t(355) = -21.73, $p < .001$]; and (c) as arousing a greater jealous emotional response [(M = 5.74, SD = 0.78), t(347) = 30.00, $p < .001$]. Results were similar within heterosexual free-cyclers as women reported high revealingly dressed women: (a) as more attractive [(M = 4.71, SD = 0.80), t(175) = 3.43, $p < .001$] and more negative (M = 5.46, SD = 0.68), t(184) = 19.40, $p < .001$; (b) as less interesting as potential friends [(M = 3.51, SD = 0.77), t(178) = -17.31, $p < .001$]; and (c) as arousing a greater jealous emotional response [(M = 5.68, SD = 0.80), t(174) = 19.35, $p < .001$]. The findings were similar within the other two samples examined [all homosexual women (data not shown) and all heterosexual women (see Table 2.3)].

Hypothesis 2: Short-Term Mating Orientation (STMO) and Biases of Revealing Dress. It was hypothesized that women's STMO is associated with the extent to which women hold RD biases. Paired-sample *t*-tests were conducted on median split STMO groups (low ≤ 28, high ≥ 29). Within the full sample of women, there were significant group differences between women low versus high on STMO on the promiscuous, attractiveness, trustworthy, nice, intelligence, friend, and flirtatious RD difference scores (see Table 2.3 for means, *SD*s, and

Table 2.3

Paired-Sample t-tests Comparing Low and High Short-Term Mating Orientation Groups on Revealing Dress (RD) Biases for All Women and Free-Cyclers

	All Women (n = 371)					Heterosexual Free-Cyclers (n = 214)				
RD Bias	Low STMO Mean (*SD*)	High STMO Mean (*SD*)	*T*	*df*	*P*	Low STMO Mean (*SD*)	High STMO Mean (*SD*)	*t*	*df*	*p*
	Likert RD Difference Scores[a]					Likert RD Difference Scores[a]				
Attractiveness	0.17 (0.94)	0.37 (0.68)	-2.34	282.80	.020	0.11 (0.88)	0.74 (0.76)	-1.21	145	.228
Trustworthy	-1.54 (1.16)	-0.97 (1.11)	-4.63	341	< .001	-1.39 (1.00)	-0.85 (1.14)	-3.01	141	.003
Feminine	0.46 (0.90)	0.46 (0.61)	-0.01	244.75	.992	0.55 (0.85)	0.52 (0.71)	0.28	136	.780
Promiscuous	2.47 (1.72)	1.77 (1.55)	3.88	321	< .001	2.44 (1.55)	1.27 (1.36)	4.58	132	< .001
Nice	-1.17 (0.98)	-0.76 (0.96)	-3.79	313	< .001	-1.04 (0.93)	-0.62 (0.93)	-2.61	132	.010
Intelligence	-1.20 (1.02)	-0.74 (0.96)	-4.23	321	< .001	-1.00 (0.92)	-0.55 (0.89)	-2.91	133	.004
Friend	-1.36 (1.02)	-0.92 (1.03)	-3.79	313	< .001	-1.16 (0.89)	-0.76 (1.06)	-2.33	131	.021
Jealous Response	1.07 (1.07)	0.91 (0.83)	3.85	294.14	.124	1.05 (1.11)	0.74 (0.76)	1.97	138.02	.057
Partner's Attraction[c]	0.81 (0.84)	0.73 (0.70)	0.90	319	.370	0.75 (0.86)	0.55 (0.67)	1.51	132	.135
Flirtatious	1.87 (1.33)	1.27 (1.14)	4.41	305.07	< .001	1.89 (1.31)	1.00 (1.05)	4.44	143	< .001
Relative Attractiveness[d]	-0.53 (0.67)	-0.55 (0.48)	0.41	257.94	.681	-0.49 (0.62)	-0.47 (.49)	-0.20	131	.85
	Forced-Choice RD Scores[b]					Forced-Choice RD Scores[b]				
Attractiveness	4.67 (0.86)	4.91 (0.61)	-2.91	263.83	.004	4.63 (0.89)	4.77 (0.66)	-1.06	145	.292
Friend	3.37 (0.83)	3.79 (0.69)	-4.97	300.88	< .001	3.27 (0.81)	3.76 (0.64)	-4.03	148	< .001

(Continued)

Table 2.3 (Continued)

	All Women (n = 371)					Heterosexual Free-Cyclers (n = 214)				
RD Bias	Low STMO Mean (SD)	High STMO Mean (SD)	T	df	P	Low STMO Mean (SD)	High STMO Mean (SD)	t	df	p
	Forced-Choice RD Scores[b]					Forced-Choice RD Scores[b]				
Negative	5.58 (0.66)	5.31 (0.61)	3.93	342	< .001	5.64 (0.67)	5.23 (0.55)	4.07	151	< .001
Jealous Response	5.77 (0.86)	5.74 (0.69)	.324	287.82	.746	5.75 (0.87)	5.58 (0.71)	1.29	144	.200

Note. RD = revealing dress; Low STMO (Short-Term Mating Orientation) = restricted women; High STMO = unrestricted women. STMO groups were created based on a median split. Similar results were reported within predominantly homosexual women and predominantly heterosexual women.

[a] Scores are difference scores that were calculated by subtracting ratings of less revealing dress from ratings of high revealing dress. Higher scores indicate that participants rated highly revealing dress as being higher on the particular attribute as compared to less revealing dress.

[b] Higher scores indicate that participants in that group rated highly revealing dress as being higher on the particular attribute as compared to less revealing dress.

[c] Partner's Attraction scores reflect the extent to which women felt that their partner would perceive the woman as attractive.

[d] Relative Attractiveness scores reflect how attractive women view themselves compared to the photos with lower scores reflecting lower relative evaluations of the self.

paired-sample *t*-tests; and Figure 2.1a). Specifically, unrestricted (high STMO) women evaluated photographs of high versus low revealingly dressed women as higher in attractiveness, trustworthiness, niceness, intelligence, and friendship interest relative to restricted (low STMO) women. Women low on STMO viewed high revealingly dressed women as more promiscuous and flirtatious than less revealingly dressed women. In addition, significant differences on the attractiveness, friend, and negative forced-choice RD scores between the two STMO groups were found (see bottom panel of Table 2.3). These findings indicate that unrestricted (high STMO) women hold more of the attractiveness of RD bias; but less of the untrustworthy, promiscuous, not-nice, unintelligent, not-friend, flirtatious, and negative RD biases compared to restricted (low STMO) women.

Within the group of heterosexual free-cycling women, paired-sample *t*-tests also indicated significant differences on the trustworthy, promiscuous, nice, intelligence, friend, and flirtatious RD scores between women high versus low on STMO (see Table 2.3 and Figure 2.1b). Significant differences on the forced-choice friend and negative perception of RD scores between the two STMO groups were also found (see Table 2.3). The only difference between the analyses in the full sample and the free-cycling women is the group STMO difference in ratings of attractiveness for the full sample, but not the free-cycling group.

Exploratory Analyses. In order to examine whether other reproductively relevant individual difference variables or traits are associated with biases of revealing dress, Spearman's rho correlations were calculated between each of the demographic and reproductively relevant variables [i.e., age, sexual orientation (Kinsey, 1974), SOI, STMO, LTMO, BES, SPMS and MCSD] and the RD rating scores (i.e., 11 Likert-rating RD difference scores and four forced-choice RD scores]. The means and SDs for the Likert-rating and forced-choice RD scores are

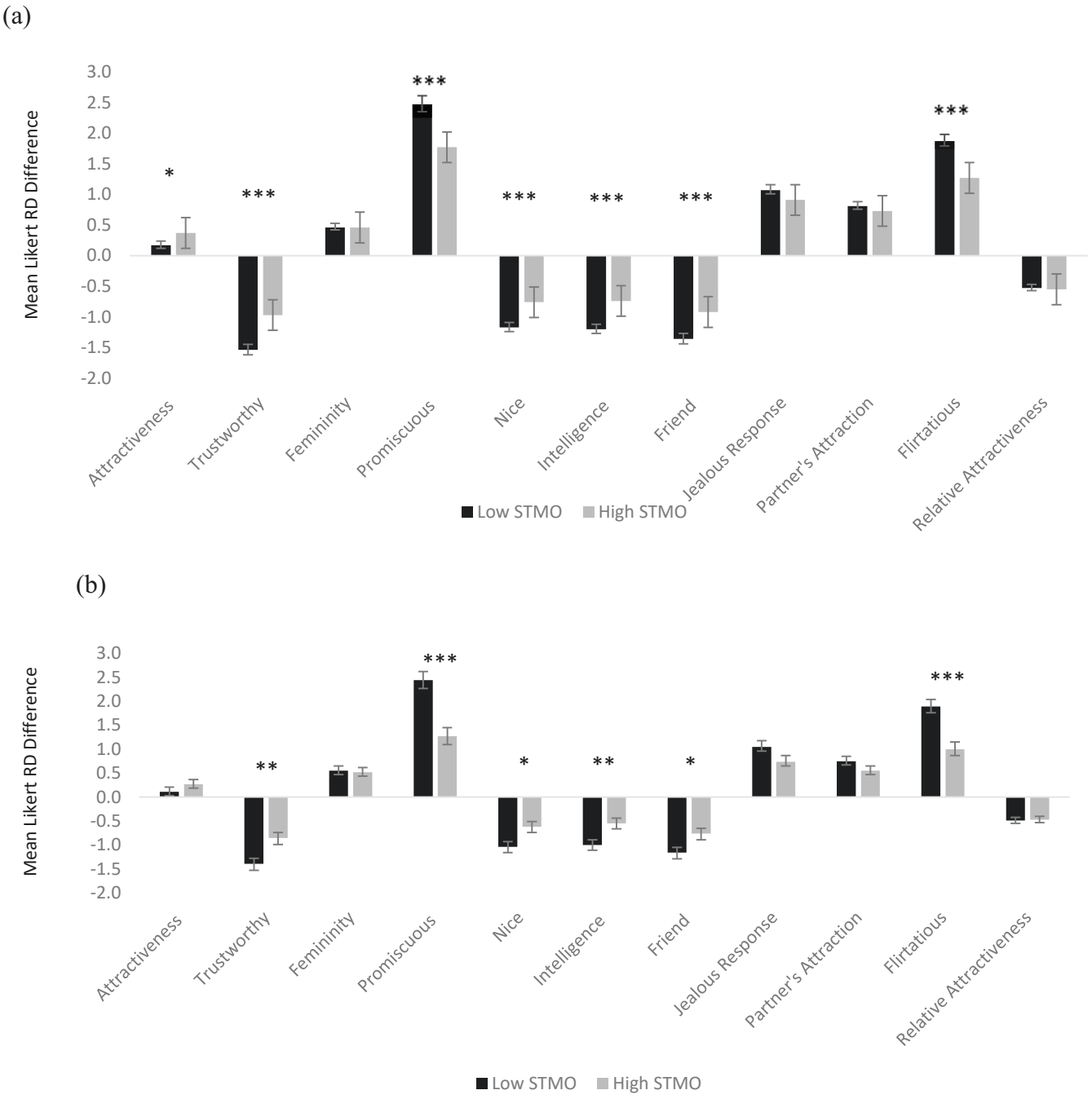

Figure 2.1. Mean Likert revealing dress (RD) difference scores for women who are low (≤ 28) versus high (>28) on STMO (Short-Term Mating Orientation) for: (a) all women (n = 358), and (b) predominantly heterosexual free-cycling women (*n* = 133). Scores above zero indicate that participants rated the women with highly revealing dress as being higher on the particular attribute as compared to women with less revealing dress, and the reverse is true for scores below zero (i.e., low RD is evaluated as having more of the trait). In general, the further the score is from zero, the greater the particular RD bias is in one direction or the other. Overall, unrestricted (high STMO) women reported more of the attractiveness RD bias; and less of the untrustworthy, promiscuity, not-nice, unintelligent, not-friend, and flirtatious RD biases. Error bars were based on SEM.
* $p < .05$; ** $p < .01$; *** $p < .001$.

found in Table 2.4 and the correlations are found in Table 2.5. Across both samples, the correlations indicated that all the variables were associated with at least one RD rating score, but that the sexual orientation, STMO, LTMO, and SOI variables were most strongly associated with the RD scores. It is important to note that a positive correlation reflects that, in comparison to women with low scores on the demographic/mating variable, women high on the variable tended to evaluate more revealingly dressed women as having relatively more of the particular trait in comparison to less revealingly dressed women. Within all women, sexual orientation scores (high scores are associated with a greater orientation towards homosexuality) were positively associated with the trustworthy, nice, intelligence, and friend revealing dress RD difference scores and the friend forced-choice RD score; and were negatively associated with the promiscuity and flirtatiousness RD difference scores, and the negative forced-choice RD scores. SOI was positively associated with the trustworthy, nice, intelligence, and friend RD difference scores, and the attractiveness and friend forced-choice RD scores (see Figure 2.2 for correlations above .35). SOI was negatively associated with the attractiveness, promiscuity, and flirtatiousness RD difference scores, and the negative forced-choice RD score (see Figure 2.2 for scatterplots reflecting relationships for correlations greater than .35).

Short-term mating orientation (STMO) was positively associated with the attractiveness, trustworthy, and intelligence RD difference scores, and the attractiveness and friend forced-choice RD scores. STMO was negatively associated with the promiscuity, friend, partner's attraction, and flirtatious RD difference scores, and the negative forced-choice RD score. Long-term mating orientation (LTMO) was positively associated with the promiscuity, jealousy, and flirtatiousness RD difference scores; and the negative and jealous emotional response forced-

Table 2.4

Means (and Standard Deviations) for Likert-Rating and Forced Choice Revealing Dress Scores for All Women and Predominantly Heterosexual Free-Cyclers

	All Women (n = 365[a])	Heterosexual Free-Cyclers (n = 153[b])
	Likert RD Difference Scores[c]	
Attractiveness	0.28 (0.87)	0.21 (0.79)
Trustworthiness	-1.23 (1.17)	-1.13 (1.08)
Feminine	0.46 (0.79)	0.53 (0.79)
Promiscuous	2.07 (1.72)	1.90 (1.58)
Nice	-0.94 (1.00)	-0.83 (0.93)
Intelligence	-0.95 (1.04)	-0.78 (0.92)
Friend	-1.09 (1.05)	-0.94 (0.99)
Jealous Response	0.98 (0.95)	0.48 (0.78)
Partner's Attraction[e]	0.76 (0.78)	0.64 (.078)
Flirtatious	1.53 (1.30	1.47 (1.27)
Relative Attractiveness[f]	-0.55 (0.58)	-0.48 (0.56)
	Forced-choice RD Scores[d]	
Attractiveness	4.82 (0.74)	4.71 (0.80)
Friend	3.60 (0.78)	3.51 (0.77)
Negative	5.44 (0.65)	5.46 (0.68)
Jealous Response	5.75 (0.78)	5.68 (0.80)

Note. RD = revealing dress.

[a] Sample sizes for all women ranged from 301 to 365 due to missing data.

[b] Sample sizes for heterosexual free-cyclers ranged from 131 to 153 due to missing data.

[c] Likert RD difference scores were calculated by subtracting ratings of less revealing dress from ratings of highly revealing dress. Higher scores indicate that participants rated revealing dress as being higher on the particular attribute as compared to less revealing dress.

[d] Higher scores on each of these scales reflects the tendency to evaluate the high revealingly dressed women as relatively higher on this characteristic (when comparing her to the less revealingly dressed women) than women with low scores on this scale.

[e] Partner's Attraction scores reflect the extent to which women felt that their partner would perceive the woman as attractive.

[f] Relative Attractiveness scores reflect how attractive women view themselves compared to the photos with lower scores reflecting lower relative evaluations of the self.

Table 2.5

Spearman's rho Correlations between Mating-Relevant Variables and Revealing Dress (RD) Perception Scores for All Women and Heterosexual Free-Cyclers

	All Women (n = 365[a])							Heterosexual Free-Cyclers (n = 153[b])						
RD Bias	SO	SOI	STMO	LTMO	BES	SPMS	SD	SO	SOI	STMO	LTMO	BES	SPMS	SD
	Likert RD Difference Scores[c]							Likert RD Difference Scores[c]						
Attractiveness	.09	-.13*	.17*	-.04	-.16*	.02	-.20**	.19*	.19*	.11	.05	-.25**	.10	-.17*
Trustworthy	.18**	.17*	.19*	-.30**	.03	-.04	.01	.22**	.35**	.29**	-.35**	-.02	-.13	-.03
Feminine	-.05	.05	.06	.05	-.11	.03	-.14*	-.05	.09	-.32**	.36**	-.17	.07	-.11
Promiscuous	-.21**	-.18*	-.17*	.21**	-.02	.02	-.10	-.22*	-.30**	-.29**	.29**	-.03	.08	-.08
Nice	.19**	.18*	.16*	-.23**	.07	.01	.00	.26**	.34**	.25**	-.26**	.04	.02	-.05
Intelligence	.19**	.17*	.21**	-.22**	.01	.01	-.02	.21*	.38**	.32**	-.29**	.06	-.01	-.04
Friend	.18*	.14*	-.26**	.06	.03	-.05	.01	.21*	.29**	.26**	-.29**	.01	-.10	-.08
Emotional Response	-.03	-.04	-.02	.20**	-.07	.09	-.03	.01	-.04	-.12	.27**	-.07	.20*	.01
Partner's Attraction[e]	.01	-.03	-.19*	.11	-.05	.09	-.08	.03	-.02	-.10	.18*	-.12	.22*	-.11
Flirtatious	-.17**	-.17*	-.19*	.26**	-.03	.04	-.05	-.20*	-.32**	-.32**	.36**	-.03	.14	.01
Relative Attractiveness[f]	.07	-.01	-.03	-.06	.05	-.07	.21*	-.08	-.06	-.02	-.05	.10	-.05	.14
RD Bias	Forced-choice RD Scores[d]							Forced-choice RD Scores[d]						
Attractiveness	.10	.22**	.19**	.01	-.13*	.10	-.24**	.14	.25**	.17*	-.06	-.12	.13	-.24**
Friend	.24**	.32**	.30**	-.20**	.12*	.17**	-.06	.08	.37**	.30**	-.19*	.10	.18*	.05
Negative	-.26**	-.24**	-.22**	.23**	-.09	-.05	-.02	-.22**	-.36**	-.33**	.20**	.01	-.12	-.02
Jealous Response	-.08	-.02	-.03	.19**	-.23**	-.05	-.10	.01	-.08	-.08	.21*	-.21*	-.11	-.12

Note. RD = revealing dress; SO = Sexual orientation based on the Kinsey Heterosexual-Homosexual Rating Scale; SOI = Sociosexuality Inventory; STMO = Short-Term Mating Orientation; LTMO = Long-Term Mating Orientation; BES = Body Esteem Scale; SPMS = Self-Perceived Mating Success scale; SD = Social desirability based on the Marlow Crown Social Desirability Scale (short form).

[a] Sample sizes for all women ranged from 301 to 365 due to missing data.

[b] Sample sizes for heterosexual free-cyclers ranged from 131 to 153 due to missing data.

[c] Likert RD difference scores were calculated by subtracting ratings of less revealing dress from ratings of highly revealing dress. Higher scores indicate that participants rated highly revealing dress as being higher on the particular attribute as compared to less revealing dress. However, positive correlations suggest that the demographic variable is associated with the score and the direction of the score can only be interpreted by examining the scatterplot of data.

[d] Higher scores on each of these scales reflects the tendency to evaluate the high revealingly dressed women as relatively higher on this characteristic (when comparing her to the less revealingly dressed women) than women with low scores on this scale.

[e] Partner's Attraction scores reflect the extent to which women felt that their partner would perceive the woman as attractive.

[f] Relative Attractiveness scores reflect how attractive women view themselves compared to the photos with lower scores reflecting lower relative evaluations of the self.

* < .05; ** < .01; ***< .001.

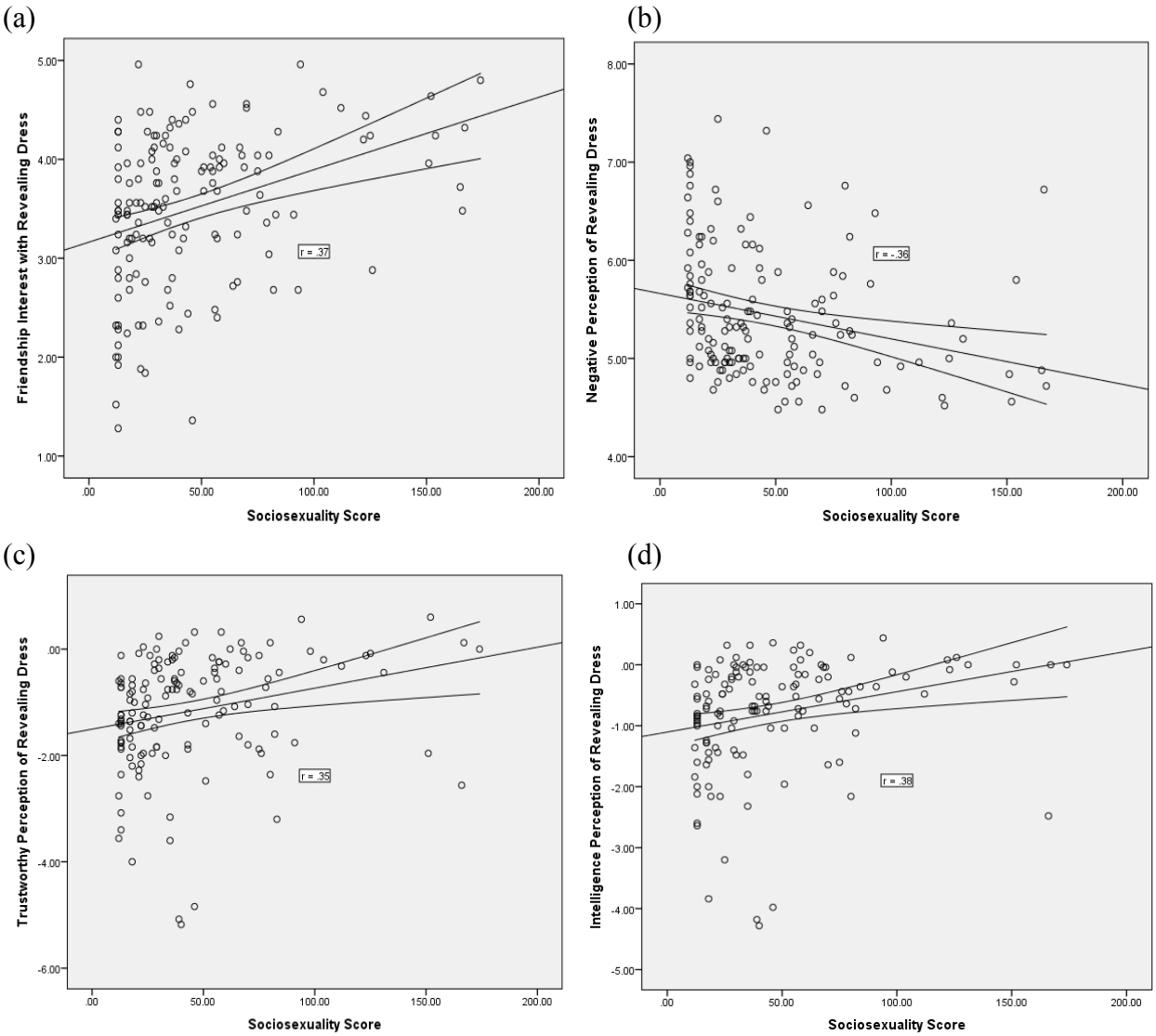

Figure 2.2. Scatterplots reflect relationships between sociosexuality scores and four perceptions of revealing dress in heterosexual free-cycling women. Sociosexuality (SO) scores were positively associated with evaluating revealingly dressed women as relatively: (a) more interesting as potential friends, (b) less negative, (c) more trustworthy, and (d) more intelligent. This suggests that higher SO or unrestricted women show less of the not-friend, negative, untrustworthy, and unintelligent revealing dress biases in comparison to lower SO restricted women. The graphs reflect correlations above .35 and below -.35. Error bars represent 95% confidence intervals.

choice RD scores (see Figure 2.3 for correlations above .28 and below -.32). LTMO was also negatively associated with the trustworthy, nice, and intelligence RD difference scores, and the friend forced-choice RD score (see Figure 2.3 for scatterplots reflecting relationships for correlations greater than $|.35|$).

Body esteem (BES) was positively associated with the friend RD forced-choice scores and negatively associated with the attractiveness RD difference score, and the attractiveness and jealous emotional response forced-choice RD scores. Mate value (SPMS) was positively associated with the friend forced-choice RD scores. Finally, social desirability (MCSD) was positively associated with the relative attractiveness RD difference score, and negatively associated with the attractiveness and femininity RD difference scores and the attractiveness forced-choice RD score.

Correlations indicated similar results within predominantly heterosexual non-HC using women (see Table 2.5) and many of the correlations were even stronger in this sample, particularly for SOI. Correlations within all predominantly homosexual women and all predominantly heterosexual women were similar to those in the larger samples (not shown here).

The correlations provide further support for Hypothesis 2 as STMO was significantly associated with eight of the 11 RD difference scores and three of the four forced-choice RD scores (see Table 2.5). Results suggest that, in comparison to women lower on STMO, women higher on STMO view high revealingly dressed women as relatively more intelligent and are more interested in befriending them relative to low revealingly dressed, perhaps due to the fact that the perceiving women view the women in the photographs as similar to themselves or view them as having a similar mating strategy to themselves. Also, women higher on STMO also view

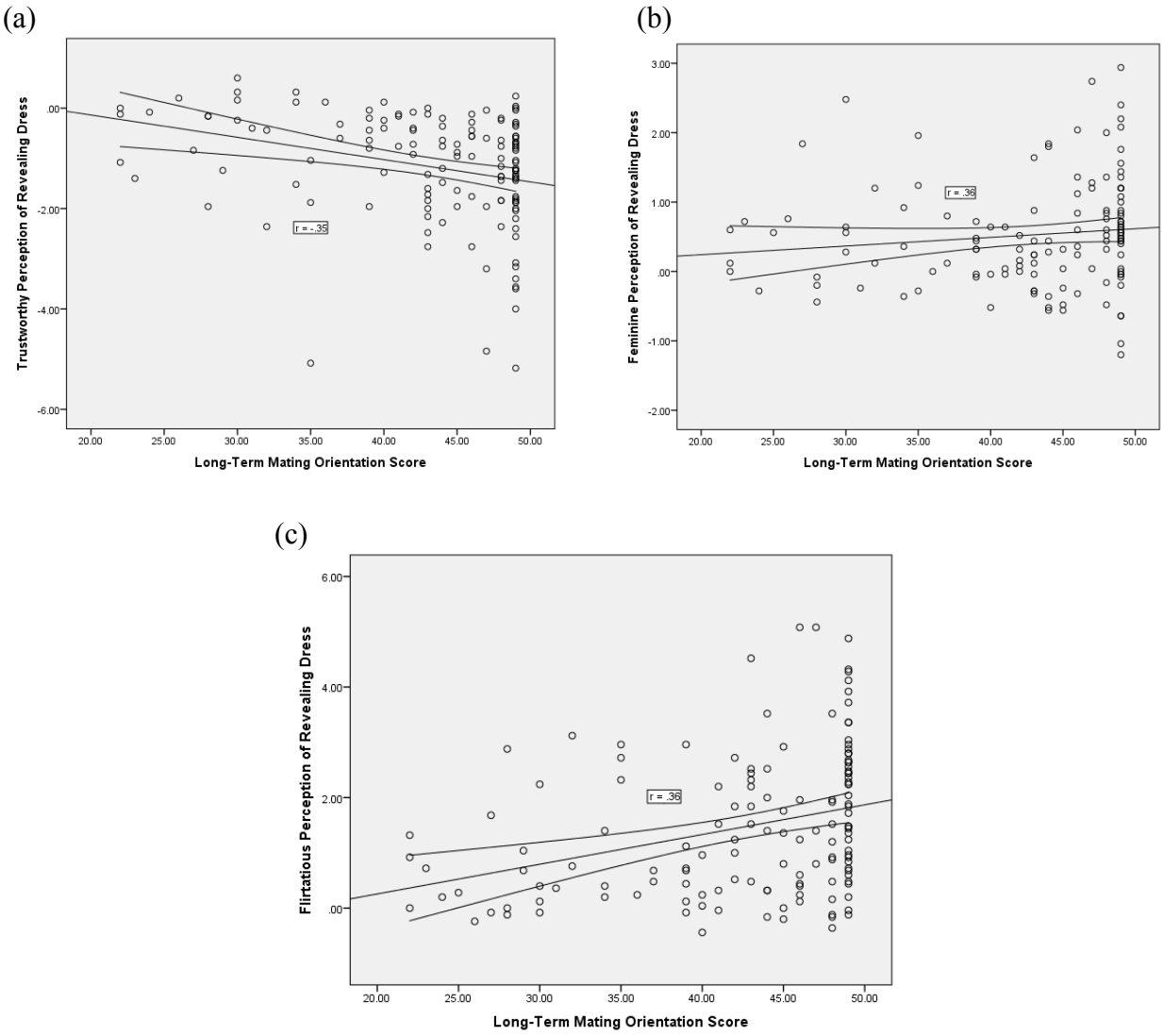

Figure 2.3. Scatterplots reflect relationships between Long-Term Mating Orientation (LTMO) and evaluations of women dressed in a revealing manner in heterosexual free-cycling women. A higher LTMO was associated with evaluating revealingly dressed women as relatively: (a) less trustworthy, (b) more feminine, and (c) more flirtatious. These results suggest that, in comparison to women with lower LTMO, women with higher LTMO tend to show more of the untrustworthy, feminine, and flirtatiousness revealing dress biases. The graphs reflect correlations above .35 and below -.35. Error bars represent 95% confidence intervals.

high revealingly dressed women as relatively more attractive and view them less negatively than less revealingly dressed women in comparison to women lower on STMO (see Figure 2.4).

Relationship status, virginity status, and HC use were also explored to see if these mating relevant variables were associated with RD scores. Independent sample *t*-tests were conducted to compare single women to partnered women on the Likert RD difference scores. Within all women, partnered (M = 1.18, SD = 0.97) women had a greater jealous emotional response RD scores than single (M = 0.84, SD = 0.91) women, $t(353) = -3.39$, $p = .01$. Partnered (M = 2.31, SD = 1.70) women also had higher promiscuous perception of RD scores than single (M = 1.90, SD = 1.62) women, $t(330) = -2.16$, $p = .03$. However, partnered (M = -1.37, SD = 1.23) women also had lower trustworthy perception RD scores than single (M = -1.11, SD = 1.08) women, $t(354) = 2.16$, $p = .03$. These results suggest that compared to single women, partnered women experience relatively more of a jealous emotional response towards high revealingly dressed women, view them as relatively more promiscuous, and rate them as relatively less trustworthy than less revealingly dressed women. No other significant differences were found for these RD scores.

Women who have never had sex (virgins) were compared to women who have had sex (non-virgins) on the Likert RD difference scores. Within all women, there was a significant difference on relative attractiveness RD scores for virgin (M = 0.07, SD = 0.78) and non-virgin (M = 0.36, SD = 0.80) women, $t(367) = 2.61$, $p = .01$, indicating that compared to non-virgin women, virgin women rate themselves as relatively less attractive than high revealingly dressed women relative to less revealingly dressed women. Using the forced-choice RD scores, there were significant differences on friendship interest RD scores for virgin (M = 3.32, SD = 0.75) and non-virgin (M = 3.68, SD = 0 .77) women, $t(353) = 3.68$, $p < .001$; attractiveness perception

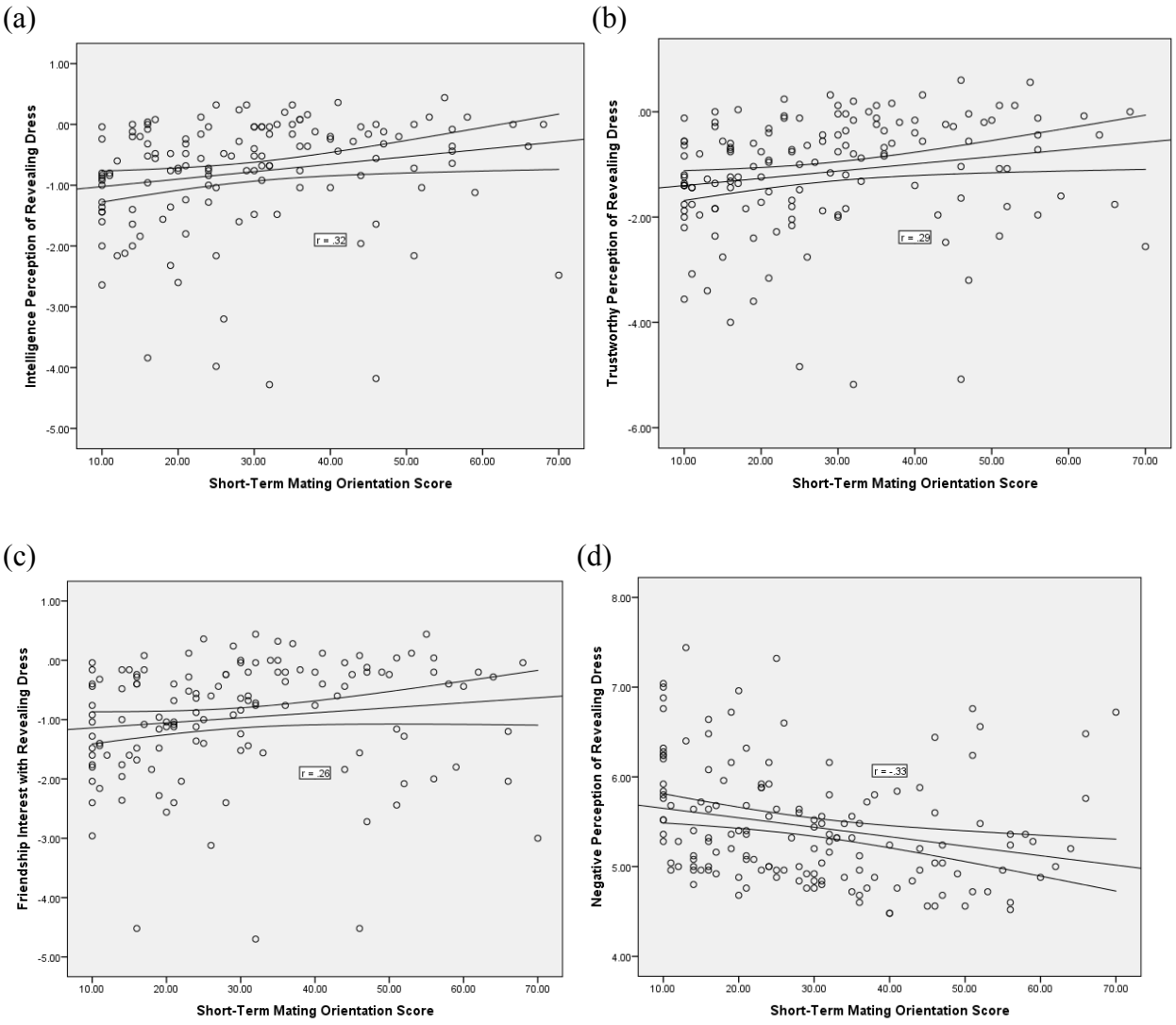

Figure 2.4. Scatterplots reflect relationships between Short-Term Mating Orientation (STMO) and evaluations of women dressed in a revealing manner for heterosexual free-cycling women. A higher STMO was associated with evaluating revealingly dressed women as relatively: (a) more intelligent, (b) more trustworthy, (c) more interesting as potential friends, and (d) less negative. These results suggest that, in comparison to women with lower STMO, women with higher STMO tend to show less of the unintelligent, untrustworthy, not-friend, and negative revealing dress biases. The graphs reflect correlations above .28 and below -.32. Error bars represent 95% confidence intervals.

RD scores for virgin (M = 4.67, SD = 0.73) and non-virgin (M = 4.86, SD = 0.75) women, $t(353) = 2.01$, $p = .04$; and negative perception of RD scores for virgin (M = 5.57, SD = 0.68) and non-virgin (M = 5.75, SD = 0.77) women, $t(355) = -2.03$, $p = .04$. These results suggest that compared to virgin women, women who have had sexual intercourse report more interest in wanting to be friends with high revealingly dressed women, rate them as more attractive, and judge them to be relatively more attractive than themselves in comparison to less revealingly dressed women. Likewise, non-virgin women reported a greater negative perception towards high revealingly dressed women relative to less revealingly dressed in comparison to virgin women. No other significant group differences were found for the Likert RD scores or the forced-choice RD scores.

Finally, analyses of covariance (ANCOVAs) were conducted to compare women who use HCs to women who do not use HCs (i.e., free-cyclers) on the Likert RD difference scores with relationship status as the covariate. Within all women, there was a significant difference on the trustworthy perception of RD scores for HC users (M = -1.63, SD = 1.31) and free-cyclers (M = -1.03, SD = 0.90), $F(1, 163) = 13.27$, $p = .01$; the nice perception of RD scores for HC users (M = -1.31, SD = 1.03) and free-cyclers (M = -0.79, SD = 078), $F(1, 136) = 10.46$, $p = .01$; the intelligence perception of RD scores for HC users (M = -1.37, SD = 1.03) and free-cyclers (M = -0.79, SD = 0.78), $F(1, 163) = 11.35$, $p = .01$; the friendship interest RD scores for HC users (M = -1.55, SD = 1.14) and free-cyclers (M = -0.84, SD = 00.79), $F(1, 136) = 15.62$, $p < .001$; and the flirtatious perception of RD scores for HC users (M = 2.0, SD = 1.30) and free-cyclers (M = 1.50, SD = 1.23), $F(1, 163) = 7.16$, $p = .04$. There were no differences on the forced-choice RD scores. The findings suggest that HC using women viewed the revealingly dressed women (compared to the non-revealingly dressed women) as relatively less trustworthy, nice, and intelligent;

expressed less interest in friendship with them, and rated them as more flirtatious than free-cycling women.

The *t*-tests for relationship status and virginity status were re-run on the predominantly heterosexual free-cyclers. There was a significant difference on the jealous emotional response towards RD scores between single ($M = 0.74$, $SD = 1.00$) and partnered ($M = 1.15$, $SD = 0.89$) women; $t(150) = -2.63$, $p = .01$. As in the full sample of women, these results suggest that partnered women experienced more of a jealousy emotional response towards high revealingly dressed versus less revealingly dressed women, in comparison to single women. No other significant differences were reported for the Likert RD difference scores or forced-choice RD scores. Additionally, no group differences were found between virgin and non-virgin women on any of the scores within predominantly heterosexual free-cyclers.

Discussion

Summary of Findings

The results of the present study revealed that women view high revealingly dressed women as more attractive, feminine, promiscuous, and flirtatious; and less trustworthy, nice, and intelligent than less revealingly dressed women. In addition, women were less interested in being friends with high revealingly dressed women, had more of a jealous emotional response towards them, reported that their partners would be more attracted to them, and rated themselves as less relatively attractive than high revealingly dressed women in comparison to less revealingly dressed women. These results support Hypothesis 1. In addition, unrestricted (high STMO) women held more of the attractiveness revealing dress bias; but less of the untrustworthy, promiscuous, not-nice, unintelligent, not-friend, flirtatious, and negative revealing dress biases compared to restricted (low STMO) women. This supports Hypothesis 2.

A number of other individual difference variables or mating-relevant traits were consistently associated with perceptions and biases towards revealing dress: sexual orientation, sociosexuality, short-term mating orientation, long-term mating orientation, and social desirability. Additionally, body esteem, self-perceived mating success, relationship status, virginity status, and HC use were also associated with some biases about revealing dress. A more negative perception of revealing dress was found in women who were partnered (versus single), virgins (versus sexually experienced), HC users (versus free-cyclers), low (versus high) in STMO, low (versus high) in sociosexuality, and high (versus low) in LTMO. These results suggested that mating-relevant observer characteristics are related to biases regarding revealing styles of dress.

Hypothesis 1: Women Hold Biases about Revealing Dress

In support of Hypothesis 1, we found that women view high revealingly dressed women as more attractive, feminine, promiscuous, and flirtatious; but less trustworthy, nice, and intelligent than less revealingly dressed women. These findings also provide evidence of validity for the stimuli used in Study 2; the photographs of high revealingly dressed women were viewed as more promiscuous-looking than the photographs of less revealingly dressed women. The results from the test of Hypothesis 1 are consistent with previous research which indicated that women who wear highly revealing clothing are judged as more sexually appealing, attractive, negative (i.e., less faithful in marriage and more likely to use sex for personal gain), and sexual (i.e., more likely to engage in sexual teasing and more likely to be sexually experienced) than women who wear non-revealing clothing (Cahoon & Edmonds, 1987; Edmonds & Cahoon, 1986). Additionally, these findings fit with Gurung and Chrouser's (2007) findings that women who wear little or extremely tight clothing are perceived as being more attractive, more feminine,

more sexually experienced, more desirable, but also less capable, less strong, less determined, less intelligent and as having less self-respect. Research has also found that women with more feminine faces are more inclined to pursue ST relationships than women with more masculine faces (Boothroyd et al., 2008). This raises the possibility that women have evolved to be sensitive to this female facial cue, particularly since men tend to rate more feminine female faces as more likely to engage in ST relationships and more attractive for ST relationships (Little, Jones, Feinberg, & Perrett, 2014). This is further exemplified by the finding that pictures of unrestricted female composites are judged as significantly more feminine than restricted female composites (Boothroyd et al., 2008). The current study's findings extend the previous work by also examining the traits of perceived trustworthiness, flirtatiousness, and niceness; as well as observer jealous emotional response, appraisal of partner attraction, relative attractiveness to oneself, and interest in friendship.

The majority of previous studies have examined perceptions of revealing dress from a social perspective and have discussed the findings in the context of objectification (e.g., Daniels & Zurbriggen, 2016; Graff, Murnen, & Smolak, 2012; Gurung & Chrouser, 2007; Holland & Haslam, 2013; Nezlek et al., 2015; Tiggemann & Andrew, 2012) and attribution (e.g., McLeod, 2010) theories. While the findings can be interpreted within the context of these theories, it is also possible that revealing dress biases evolved because they help support women's mating orientations or mating strategies. For example, such biases may be helpful to individuals when pursuing a partner by using ST mating strategies and competing with others who are pursuing the same partner, but who use an opposing strategy (e.g., LT mating strategies). If a woman was interested in attracting a high quality mate, then it would have been adaptive for her to perceive

and judge her intrasexual competitors in such a way that motivated her to alter her behaviour or appearance in order to increase her chances of attracting the mate.

The current findings suggest that women show revealing dress biases that are mating relevant (e.g., feeling more jealous of her, feeling their partner would be more attracted to her [i.e., potential mate rival], judging her as less trustworthy, and judging her as more flirtatious). All of these biases may activate mate-guarding or competitor tactics in women as these biases would arouse emotions or thoughts that contribute to beliefs that one's potential or actual relationship could be threatened. Of all the 11 attributional biases examined, the characteristics showing the largest biases or differences between the highly revealing and less revealing photographs were: flirtatiousness, promiscuity, trustworthiness, and jealous emotional response. The smallest biases were for attractiveness and femininity. This pattern in the biases also highlights the fact that revealing dress biases are motivationally relevant to mating as stronger biases exist for attributes that may elicit rival-relevant behaviour.

Hypothesis 2: Short-Term Mating Orientation Associated with Revealing Dress Biases

The current study found that women with more of a STMO (i.e., more unrestricted women) rated high revealingly dressed women as relatively less promiscuous and flirtatious than did less revealingly dressed women, as compared to women with less of a STMO (i.e., more restricted women). In other words, the women high on STMO showed less of a RD bias with respect to ratings of promiscuity and flirtatiousness and tended to evaluate the low and high revealingly dressed women more similarly in terms of these traits when compared to low STMO women who showed more of a RD bias. Additionally, women high on STMO evaluated the more revealingly dressed women as more attractive, trustworthy, nice, intelligent, and as better potential friends; and less promiscuous, flirtatious, and "negative". Thus, being high in STMO

was associated with a reduction in all of these mentioned biases except for the attractiveness bias which was actually increased in the high STMO group.

The above findings suggest that one's mating strategy (e.g., degree of STMO) influences how one perceives and judges others. Judging others is a key aspect of intrasexual competition, which involves two or more members of the same sex competing against each other for a resource that one of the competitors does not wish to share or does not have access to (Cox & Fisher, 2008). Intrasexual competition in mating is the use of strategies to compete with members of the same sex for mating access to members of the opposite sex (Fisher, 2004). It involves two strategies: (1) competitor derogation; and (2) self-promotion. Competitor derogation is any act intended to decrease a potential rival's perceived mate value relative to one's self, while self-promotion refers to any act used to enhance the positive qualities of oneself, relative to same-sex others.

It may be adaptive for women less focused on pursuing a short-term mating strategy to be more apt to emphasize a potential same-sex rival's promiscuity or infidelity (Buss & Dedden, 1990). This is in line with the present finding that women low on STMO associated highly revealing dress with lower attractiveness, trustworthiness, niceness, and intelligence, but more promiscuity. As well, the association between higher STMO and higher relative attractiveness ratings of high revealing dress are in line with another study suggesting that women high in STMO may be more attuned to detecting physical indicators of attractiveness (Sacco et al., 2009). One could argue that it would be adaptive for unrestricted women to hold stronger biases about high revealingly dressed women as it would help them to identify their potential competitors (i.e., those using a similar strategy), and thus activate their competitive strategies to attract a mate. However, it is also possible that such competitive strategies may be unnecessary

in high STMO women if there are an abundance of attractive men interested in ST relationships. It is possible that women less interested in ST mateships hold more of the revealing dress biases because women who pursue a different mating strategy than one's own may activate the use of more competitive derogation tactics to increase one's chances of attaining desired mate. For example, Bleske and Shackelford (2001) found that women report less willingness to befriend a woman described as sexually promiscuous than one described as pursuing a LT mating strategy. It is important to note that the authors did not examine women's own mating orientation. It may be that some women view revealingly dressed women who appear interested in ST mateships as intrasexual rivals, and thus may be more likely to view them as competitors rather than friends.

Being acutely attuned to competitors who use opposing mating strategies (or who use ST strategies if one does not) would be adaptive as it would have allowed women to become aware of the threat of STMO competitors, including those who use different strategies than oneself to attract the same potential mate. To increase their chances of mating, negative biases may play a role in causing restricted women to be more aware of such competitors and to derogate competitors in order to deter their mate (or potential mates) from otherwise choosing highly revealingly dressed competitors. Future research could examine whether STMO influences the likelihood that women speak negatively to their partner about highly revealingly versus less revealingly dressed women.

The finding that high STMO women hold less of the RD biases (i.e., lower flirtatious, promiscuous and negative biases; but higher trustworthy, nice, intelligent and friend biases) than low STMO women could also be the result of high STMO women viewing revealingly dressed women as similar to themselves, thus showing a "dress similarity bias". Research has shown that people tend to perceive others positively (Reid et al., 1997) and help others (Suedfeld, Bochner,

& Wnek, 1972) who are dressed similarly to themselves. In addition, Buckley and Roach (1981) found that dress and attitude similarity has a positive effect on attraction. Individuals in the above study indicated that they would like and enjoy working with the stimulus person who was similar to them in both attitude and clothes. Research in attraction and impression formation suggests that similarities between a perceiver and a target person inferred from appearance are positively related to attraction (Park & Lennon, 2008). Based on this line of reasoning, it may be that high STMO view themselves as more similar to revealingly dressed women and therefore hold less negative biases about them. Similarly, low STMO women may see themselves as less similar to revealingly dress women and may therefore infer more negative qualities onto them as they see revealingly dressed women as quite different from themselves. Regardless of why the effect exists or how this effect is maintained, low STMO women show more of a revealing dress bias than high STMO women and this bias may have adaptive value from an evolutionary perspective.

Mating-Relevant Observer Traits Associated with Highly Revealing Dress Biases

Mating-relevant observer traits (e.g., sexual orientation sociosexuality, long-term mating orientation, body esteem, and self-perceived mate value) were also associated with perceptions and biases of revealing dress (see above sections for details). Additionally, compared to single women, partnered women had more of a jealous emotional response towards highly revealing dressed versus less revealing dressed women, viewed high revealingly dressed women as more promiscuous, and were less trusting of them than less revealingly dressed women. This fits with previous research suggesting that women in committed relationships are more jealous than single women (Burchell & Ward, 2011), but extends the finding to a specific subgroup of potential rivals. Additionally, Fisher and Cox (2011) found that women involved in romantic relationships

(e.g., casually dating to LT partnerships) were more likely to use competitor derogation tactics than women who were single. From an evolutionary perspective, it would be expected that being in a relationship would lead to an increase in feelings of jealousy towards relevant others as such reactions could lead to an increase in behaviours to detect or prevent possible infidelity (e.g., self-promotion, competitor derogation, mate retention). Thus, women in relationships may be more likely to perceive and judge revealingly dressed women as mate competitors, which could alert them to the possibility of other women poaching their partner, or to their partner's possible interest in other women (which would lead to an increase in mate retention efforts).

The current study also found that, in comparison to 'non-virgin' or sexually experienced women, virgin women reported less interest in wanting to be friends with high revealingly dressed women relative to less revealingly dressed women, and rated high revealingly dressed women as relatively less attractive. Virgin women also reported more negative perceptions of women dressed in a high versus low revealing manner, in comparison to non-virgin women. This suggests that women who have yet to have sexual intercourse may be pursuing a different mating strategy than women who have had sexual intercourse (e.g., restricted versus unrestricted), which may affect, or perhaps be related to, how they perceive potential rivals. It could also be that virgin women differ from non-virgin women in some other meaningful ways. In the current study, in comparison to non-virgin women, virgin women were significantly younger, and had lower body esteem, mate value, STMO and SOI scores. These findings provide some further evidence that virgin women may be pursuing a different mating strategy than non-virgin women (as indicated by their lower STMO and SOI scores) or may have had less opportunity to engage in sexual relationships due to being younger. It may also be that virgin women's higher biased perceptions of revealing dress are associated with their lower body esteem. Future research

should examine whether personal difference variables, such as the ones mentioned above, are associated with virginity status and perceptions of potential rivals.

It was also found that women with higher relative homosexual preferences held less of the RD biases (i.e., higher trustworthy, nice, intelligent and friend perceptions, and lower flirtatious, promiscuous and negative perceptions). This suggests that women who are attracted to women tend to show less revealing dress biases and are less likely to negatively evaluate women dressed in a revealing manner. This may occur for a number of reasons, including: (1) being sexually attracted to revealingly dress women may negate or reduce any negative biases; (2) being more open-minded and less judgemental for social/environmental reasons, including their own past experience (e.g., being negatively judged); and (3) for mating and biological reasons (e.g., mating strategy, hormonal changes across the menstrual cycle). Although beyond the scope of this paper, future research should examine whether sexual attraction and personal characteristics (e.g., open mindedness) of women with more versus less of a homosexual orientation influence or are associated with perceptions of revealing dress. In addition, future research should follow up to determine whether the mating strategy of homosexual women influences their perceptions of revealing dress, particularly since it was found in the current study that women with higher relative homosexual preferences tended to be significantly higher on sociosexuality and STMO, suggesting that they are more unrestricted in their sexual attitudes or behaviours than women with lower homosexual preferences. Another area for follow-up might be to examine the generalizability of the effect and to examine whether sexual orientation is associated with other types of biases or stereotypes.

The results also suggest that, compared to free-cyclers, women using HCs rated high revealingly dressed women as less trustworthy, nice, and intelligent; and expressed less interest

in being friends with them than less revealing dressing women in comparison to free-cyclers. HC users indicated that they believe that they have higher relative attractiveness to high revealingly dressed women versus less revealingly dressed women in comparison to free-cyclers, and HC users also rated high revealingly dressed women as being flirtier than less revealingly dressed women in comparison to free-cyclers. It is possible that there are underlying differences between women who use HCs and women who do not use HCs, or that using HCs influences one's perceptions of other women. Geary, DeSoto, Hoard, Sheldon, and Cooper (2001) found that women using HCs were more likely to report that they were more distressed by sexual infidelity and reported higher affective reactions to infidelity than women not using HCs. Thus, it is possible that women who use HCs view revealing dress more negatively than women who do not use HCs due to greater concerns that their partner will be attracted to and cheat on them with revealingly dressed women who appear interested in short-term relationships. This finding could suggest that HC users differ in their mating strategy from nonusers (e.g., women in relationships who also have more unrestricted orientations as in Oinonen, Jarva, & Mazmanian, 2008); or may suggest that HC users select different partners than free-cyclers (i.e., ones with higher STMO).

Conversely, using a scale for intrasexual competition, Cobey, Kippling, and Buunk (2013) found that HC use was associated with lower levels of intrasexual competition than when free-cycling, but only within women who were partnered. The effect was not present within single women. Thus, it is possible that there are fundamental differences between women who use HCs and women who do not use HCs, and that these differences exert influences on how women perceive other women based on style of dress. Related to this, Hahn, Fisher, Cobey, Debruine, and Jones (2016) found a positive effect of testosterone on intrasexual competitiveness, indicating that women reported greater intrasexual competitiveness when

testosterone was high. However, there were no significant effects of estradiol, progesterone, estradiol-to-progesterone ratio, or cortisol. These results complement Cobey et al.'s (2013) suggestion that reported intrasexual competitiveness varies as a function of women's testosterone level (i.e., HC use, which lowers testosterone, was associated with lower intrasexual competitiveness). However, given that OCs are associated with reduced testosterone levels (Zimmerman, Eijkemans, Bennink, Blankenstein, & Fauser, 2014), these studies do not fit with the present finding of OC users showing more revealing dress biases.

Strengths, Limitations, and Future Directions

This is the first study to examine perceptions and biases of revealing dress from an evolutionary perspective, as well as to explore new mating relevant individual difference variables that may help explain why some biases have evolved. The current study also included a large sample size and two methods (e.g., Likert-ratings and forced-choice ratings) to examine the biases. The addition of Likert-ratings of individual photographs to this area of research provides additional validity evidence to support the findings of revealing dress biases. This study also examined 12 different attributional biases whereas previous studies have examined fewer traits. This was the first study to examine whether there are revealing dress biases in terms of the perception of trustworthiness and niceness; as well as the observer's emotional response of jealousy, appraisal of partner attraction, relative attractiveness to oneself, and interest in friendship. This study was also the first to examine and find that these revealing dress biases differ as a function of female observer mating orientation and mating-relevant traits. Finally, this study used a large set of stimuli (i.e., 50 photos) to measure bias, which appears to be larger than previous studies (e.g., Daniels & Zurbriggin, 2016; Graff, Murnen, & Smolak, 2012; Gurung &

Chrouser, 2007; Nezlek et al., 2015). The methodological enhancements in the current study provide additional validity to the evidence for the existence of biases towards revealing dress.

Similar to much of the previous research on the perceptions of women's dress, the majority of participants were university students living in a North American urban city. Future research should examine if revealing dress biases are similar in individuals who are in a different stage of their lives or living in a different culture. For example, more mature adults might not hold the same views of revealing dress as younger adults. There may also be fewer or reduced biases in post-menopausal women if hormonal or reproductive factors play a role. Additionally, one might predict greater biases in more patriarchal or religious societies. Future researchers could also examine the relationship between age and perceptions of revealing dress.

The current study challenges stereotypes by suggesting that not all women judge revealingly dressed women negatively. Rather, a subgroup of women, identified based on their mating strategy (i.e., being a ST versus a LT mater), appear to have less negative perceptions of revealingly clothed women. This may be due to the fact that high STMO women see revealingly dressed women as more similar to themselves, with their ratings reflecting a similarity bias. Thus, future research may want to examine whether intergroup discrimination or bias in favour of one's own group is associated with perceptions of various levels of revealing dress.

It would also be interesting to explore the effect of conception likelihood on the perception of women's dress and revealing dress biases. Specifically, at high conception likelihood, women may become hypersensitive to the cues of intrasexual competitors and engage in greater derogation tactics. This line of research was examined in Study 2.

Conclusion

Taken together, the current study provides evidence that women perceive high revealingly dressed women as more promiscuous, flirty, feminine, and attractive; but less intelligent, nice, and trustworthy than less revealingly dressed women. In addition, women expressed less interest in friendship with high revealingly dressed women, experienced more of a jealous emotional response towards them, rate themselves as relatively less attractive than them, and feel that their partners would be more attracted to women in more versus less revealing dress. The finding that women perceive differences between the low and high revealing dress photographs provides validity for the stimuli used in this project. Finally, it was found that, compared to women low in STMO, women with more of a STMO viewed high revealingly dressed women as relatively more attractive, trustworthy, nice, and intelligent; and they expressed greater interest in friendship with them relative to women dressed less revealingly. That is, unrestricted women hold more of the attractive revealing dress biases and less of the untrustworthy, promiscuity, not-nice, unintelligent, not-friend, flirtatious, and negative biases about high revealingly dressed women. This research expands upon past research on perceptions of revealing dress, and provides evidence that women's mating strategies (e.g., sociosexuality) are associated with revealing dress biases.

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Chapter 3: Study 2

Women's Jealousy and Perceptions of Potential Rivals: Effects of Fertility, Mating Orientation, and Rival's Dress

Abstract

Previous research suggests greater intrasexual competition at menstrual cycle phases of higher (versus lower) fertility and there is some evidence for different shifts in mating effort as a function of both fertility and women's short-term mating orientation. Study 1 also found that women are more jealous of revealingly dressed women, and evaluate them more negatively and as someone to whom their partner would be attracted to. The goal of the present study was to examine how the rater's fertility status and mating orientation, and the potential rival's style of dress affect women's perceptions of other women. Using Likert-ratings and forced-choice methods, women (n = 214) rated photographs of women dressed in revealing and nonrevealing styles of dress in terms of attractiveness, as well as which woman they viewed more negatively and how jealous they felt of each woman. Ratings were completed at two time points across the menstrual cycle (low and high conception likelihood times). Women's evaluation of other women's attractiveness did not change with fertility of the rater, but women viewed revealingly dressed women more negatively when fertility was high versus low. Women also experienced more jealousy towards all women (regardless of clothing style) at higher versus lower fertility cycle phases. In addition, women low on short-term mating orientation (STMO) experienced more jealousy towards all women during higher versus lower fertility phases, while women high on STMO showed the opposite pattern (i.e., experienced less jealousy towards them at high versus low fertility phases). Results are discussed from an evolutionary and mating competition perspective, and in the context of the Periovulatory Sociosexuality Tactic Shift (PSTS) Theory.

Women's Jealousy and Perceptions of Potential Rivals: Effects of Fertility, Mating Orientation, and Rival's Dress

Past research has suggested women experience greater intrasexual competition (e.g., dehumanization and non-cooperation with other women) at higher (versus lower) fertile periods of the menstrual cycle (Eisenbruch & Roney, 2016). In addition, women's perceptions of potential rival's attractiveness change as a function of menstrual cycle phase (Fisher, 2004) and women generally have negative perceptions of revealingly dressed women (Vaillancourt & Sharma, 2011; see Study 1). Research has also indicated that some women may compare themselves with other women when competing with a rival for a potential mate and that they perceive rival women as a greater threat when such women are using the same mating strategy as them (or have the same strengths) (Buunk & Dijkstra, 2005). Thus, one's own mating strategy (i.e., an individual factor), as well as the mating strategy of a potential rival (i.e., whether it is the same or different) influences how potential rivals are perceived. However, no published studies include an examination of whether hormones or fertility influence women's perceptions of other women based on style of dress and one's mating orientation (short-term [ST] versus long-term [LT]). Furthermore, previous studies have not explored reasons why women have certain perceptions of other women as a function of hormonal status (e.g., an evolved sociosexual mating strategy). The main goal of the current study was to examine how women's fertility, sociosexuality and other women's self-presentation style (high revealing versus low revealing dress) influence one's perceptions of other women (i.e., potential rivals) in a mating context.

Factors Affecting Intrasexual Competition and Competitor Derogation

Women compete intrasexually for access to a desired partner. Since all women are not equal in terms of their physical attractiveness, personality characteristics or skills, and some have

higher mate value than others, highly valued attractive mates can be viewed as a resource and are then the target of competition for mating access. From an evolutionary perspective, a heterosexual woman's main goal in the mating context is to make herself maximally desirable to men relative to other women who are striving to achieve the same goal (Buss & Dedden, 1990).

Competitor derogation is any act intended to decrease a potential rival's perceived mate value relative to one's self (Cox & Fisher, 2008). As noted by Cox and Fisher (2008), there are nine competitor derogation strategies that women can employ for intrasexual competition. For example, changing one's own perception of a potential rival's value, which alters the perceived mate value of them, may subsequently drive or trigger certain mating behaviours. Research has found support for the notion that women's derogations influence men, as well as other women, to evaluate the derogated individual more negatively (Fisher & Cox, 2009). Fink and colleagues (2014) found that photographs of women with more feminine faces, larger breasts and lower waist-to-hip ratios received higher attractiveness and femininity ratings and were ranked highest on perceived rival status by female undergraduate students. These are also characteristics that men evaluate as attractive in women (Streeter & McBurney, 2002; Wheatley, Cardenas, & Puts, 2013), and might be characteristics that women choose to accentuate with their self-presentation and style of dress. The ability to accurately identify an attractive rival allows women to determine how desirable the potential rival may be to her partner or her potential partners, and thus to identify situations where the use of competitor derogation strategies would be advantageous. Relationship status may also relate to the use of intrasexual competitive strategies. Studies have found that women who are in romantic relationships use significantly more derogating tactics than single women (Fisher & Cox, 2011; Fisher, Cox, & Gordon, 2009).

Although jealousy is not a direct competitor derogation tactic, rival-evoked jealousy may lead to the use of derogating strategies in order to attain a potential mate or maintain one's current relationship (i.e., jealousy may be a mechanism to evoke use of these strategies). Research has indicated that priming women with photographs of physically attractive rivals evokes more jealously than physically unattractive rivals (Massar & Buunk, 2009; Massar & Buunk, 2010; Massar, Buunk, & Dechesne, 2009).

Style of Dress and Intrasexual Competition

In addition to facial attractiveness, the style of clothing a potential rival is wearing may provoke intrasexual competition. Vaillancourt and Sharma (2011) found support for the notion that style of clothing evokes derogating behaviours in women exposed to revealingly dressed rivals. The findings suggest that women judge revealingly dressed females negatively, possibly due to their appeal as additional or alternative ST partners for men. Revealing clothing can negatively affect perceivers' views of women's faithfulness or likeability (Cahoon & Edmonds 1989), as well as their trustworthiness, niceness, and intelligence (see Study 1). The ability to accurately perceive important attributes about a person based on their style of dress would be useful in determining whether specific individuals are potential rivals (e.g., whether they are pursuing a similar strategy and type of partner). The degree to which any woman is perceived as a potential rival may depend on one's mating goals. For example, if a woman is seeking a ST partner, she may be more likely to view other women as potential rivals when their style of dress is revealing or is perceived as suggesting sexual availability. The presence of other women seeking ST partners may threaten her likelihood of obtaining a ST relationship with a man. Thus, there may be individual differences (e.g., level of jealousy) in the extent to which women

perceive revealing versus nonrevealing dress as negative and this difference may have evolved to maximize each woman's chances of mating success.

Fertility and Menstrual Cycle Shifts in Preferences and Competitor Derogation

Phase of menstrual cycle or cyclical fertility has also been linked to women's mating preferences and behaviours (e.g., Buss, 2005; Scarbrough & Johnston, 2005). One recent meta-analysis indicated that women's mate preferences change across the menstrual cycle, with cyclic increases in women's evaluations of men's ST mating attractiveness, but not LT mating attractiveness, when women are most fertile (Gildersleeve, Haselton, & Fales, 2014). These findings suggest that women's preferences as they relate to ST mating may be more affected by shifts in hormones and fertility than are LT mating strategies or preferences. However, another recent meta-analysis found a lack of support for cyclic changes in women's mate preferences (Wood, Kressel, Joshi, & Louie, 2014). The latter authors suggest that the few significant preference shifts that have been found may be due to research artifacts, publication bias, or broad and less precise measurements of fertility status. Nonetheless, research has indicated that women experience other behavioural (e.g., Haselton & Gangestad, 2006; Haselton, Mortezaie, Pillsworth, Bleske-Rechek, & Frederick, 2007; Roder, Brewer, & Fink, 2009; Schwarz & Hassebrauck, 2008) and physical (e.g., Gildersleeve et al., 2012; Havlicek et al., 2008; Kuukasjarvi et al., 2004; Puts et al., 2013; Roberts et al., 2004) changes across the menstrual cycle that may reflect evolutionary adaptations, with intrasexual competition being one of them (e.g., Fisher, 2004).

Cyclic shifts in competitor derogation. Studies have suggested that women's use of competitor derogation tactics may change as a function of fertility status. Most studies examining this issue have examined whether there are cyclical shifts in women's ratings of other women's

attractiveness. For example, using a between-subjects design, Fisher (2004) found that women who were in the fertile phase (i.e., ovulatory phase) rated female faces as significantly less attractive than when they were in less fertile phases. It is possible that the cyclical shift in women's perception of other women's attractiveness evolved as a byproduct of their preference for masculine faces during phases of heightened fertility.

Research has indicated that women prefer masculinity in male and female faces when they are more fertile (Johnston, Hagel, Franklin, Fink, & Grammer, 2001; Jones et al., 2005; Penton-Voak et al., 1999; Welling et al., 2007), while preferences for more feminine faces decrease around ovulation (Jones et al., 2005; Perrett et al., 1998). Thus, increased preferences for masculine faces and decreased preferences for feminine faces at ovulation may explain Fisher's (2004) finding that women find other women less attractive during this time of the menstrual cycle. Furthermore, Vukovic and colleagues (2009) found that premenopausal women are less likely to choose feminine female faces as attractive than are postmenopausal women. This may be due to the fact that postmenopausal women have less to gain from derogating same-sex rivals as they no longer need to compete for access to "good genes".

While giving lower ratings of attractiveness is not necessarily the same as directly derogating a woman, the findings may at least partly explain or be somewhat consistent with the hypothesis that derogation of attractive same-sex competitors is more pronounced when fertility is high (Fisher, 2004; Jones et al., 2005; Welling et al., 2007). Of note, only one study has specifically examined changes in competitor derogation (e.g., ratings of attractiveness) across the menstrual cycle (e.g., Fisher, 2004). Other studies have examined intrasexual competition across the menstrual cycle more broadly, by using self-report measures in which competitive behaviour is queried rather than having participants rate potential rivals based on their style of dress.

Another study found that women's intrasexual competition does not change as a function of fertility status (Cobey, Kippling, & Buunk, 2013). Using a within-subjects design, Cobey and colleagues assessed individual differences in intrasexual competition using a 12-item scale in which women indicated how applicable each item was to them (e.g., "I want to be just a little better than other women" and "I tend to look for negative characteristics in women who are very successful"). For pair-bonded women only, it was found that when women use hormonal contraceptives (HCs) they report higher levels of jealousy than when they are regularly cycling. The authors suggested that intrasexual competition may function differently in single versus pair-bonded women, such that single women may be less influenced by the decrease in testosterone that occurs with HC use. However, it is important to note that the study had a small sample of pair-bonded women (n = 14). Cobey and colleagues also found that, when regularly cycling, both single and pair-bonded women showed no significant difference in levels of intrasexual competition when in fertile compared to non-fertile menstrual cycle days. This finding is inconsistent with Fisher (2004), but Fisher's use of a between-subjects study design should be kept in mind.

Failing to track women prospectively across the cycle may mean that results are a product of subtle group differences between women who were fertile versus non-fertile at the time of study participation. Moreover, physical attractiveness is one of several dimensions on which women may compete intrasexually and other characteristics or types of perceptions should be evaluated. Cobey and colleagues used a scale to measure intrasexual competitive attitudes (e.g., "I want to be just a little better than other women") rather than rating the physical attractiveness of photographed women, which may have addressed this concern. However, the use of photographs in Fisher's study may be a more sensitive measure in that photographs may prime

feelings of intrasexual competition and this may better assess the construct of competitor derogation. Taken together, research suggests that women experience more intrasexual competition towards other women when they are fertile possibly because mating competition is most salient at this time.

As mentioned previously, rival-evoked jealously may lead to, may occur due to, or may occur as a part of intrasexual competition. In line with this reasoning, Cobey and colleagues (2012) used a within-subjects study design and found that when women were free-cycling, they experienced more relationship-related jealousy (e.g., concerns that one's partner finds someone else more attractive or thinking that it is unacceptable for one's partner to be friends with the opposite sex) relative to when they were taking HCs. Results for single and partnered women differed somewhat. Among single women, jealousy scores were significantly higher when at fertile versus non-fertile phases of the menstrual cycle, while there was no significant difference in levels of jealousy when regularly cycling compared to when using the pill. Among partnered women who were regularly cycling, levels of jealousy were higher when in fertile than non-fertile phases. Jealousy was also higher when using the pill than when in non-fertile regularly cycling phases. However, there was no difference between pill use and fertile regularly cycling days. Overall, the results suggest that women find themselves feeling more jealousy when fertility is relatively higher, perhaps because mating competition is most salient at this time, and they may therefore monitor their partners to a greater extent. It is possible that rival-evoked jealousy leads to engagement in competitor derogation or negative perceptions of potential rivals when one is more fertile since this period reflects a time when women would benefit most from intrasexual competition (e.g., fertile women become more attentive to cues to competition or threats from external women, or are simply more likely to respond to such cues).

Interestingly, both male and female observers rate photographs of women as trying to appear more attractive when the photographed women are in the fertile as compared to the non-fertile phases of the menstrual cycle (Haselton et al., 2007). This is important for intrasexual competition as fertility may influence one's perceived physical appearance relative to a potential rival's and perceived rival attractiveness may act as a cue to a potential rival's fertility status. As well, Durante, Li, and Haselton (2008) reported shifts in women's clothing choice as a function of fertility status, with women showing a greater preference for revealing clothing near ovulation. The authors suggested that the shift in clothing preference may reflect an increase in intrasexual competition near ovulation (e.g., wanting to appear more attractive than a potential rival). However, it is also possible that it reflects an increase in desire to attract a mate.

Indeed, previous research has shown that women are more jealous and give lower attractiveness ratings to potential rivals (Buss & Dedden, 1990), especially in the fertile phase of the menstrual cycle (Fisher, 2004). This may have adaptive value as an intrasexual competitive strategy aimed at targeting a potential rival when one is fertile as this is the most critical period for conception. However, the effect reported by Fisher (2004) could also be explained by an increase in one's perception of their own attractiveness on days near ovulation rather than perceiving other women as competitors or as less attractive. It may also reflect an increased level of critical evaluation by fertile women, such that they are better able to accurately evaluate potential rivals (Fisher & Cox, 2009). It could also be that women prefer masculinity in faces when they are more fertile (Penton-Voak et al., 1999), which may explain why women find other women less attractive during this time.

The ability to compare oneself to a potential rival could have significant implications for the assessment of mate value. A woman who accurately perceives a woman as a rival could use

this information to influence a potential mate to think negatively about her, thus decreasing her mate appeal. In addition, a woman might be attempting to influence a potential rival by leading her to believe she should not compete or that she will lose because she is not as attractive or has lower mate value. As mentioned previously, it is also possible that women experience cyclical shifts in the appraisal of potential rivals because they experience shifts in their jealousy of other women across the menstrual cycle.

Periovulatory Sociosexuality Tactic Shift and ST Mating Orientation

Oinonen, Klemencic, and Mazmanian (2008) found that sociosexually restricted women (i.e., those more interested in LT mating) report an increased interest in uncommitted sex when they are most fertile (i.e., periovulatory phase), while sociosexually unrestricted women (i.e., those more interested in ST mating) shift to a decreased interest in uncommitted sex when they are most fertile. The periovulatory phase shift in sociosexual behaviour includes a shift towards more restricted sexual behaviour in unrestricted women and more unrestricted sexual behaviour in restricted women. This theory predicts that restricted women show a greater relative periovulatory peak in seeking ST mates with high physical attractiveness (i.e., good genes) during high fertility phases, as compared to unrestricted women.

Additional research has found that restricted women become more sexually proceptive near ovulation, while unrestricted women become less sexually proceptive (Phillips, Oinonen, & Mazmanian, manuscript in progress). Phillips and colleagues found that women's STMO (low versus high) was associated with differential cyclical change in women's mating relevant evaluations of men's photographs (i.e., interest in one-night stands and receptive mating behaviours with socially visible men). Specifically, unrestricted women decreased their willingness to have a one-night stand when they were relatively more fertile (i.e., a periovulatory

shift away from one's typical strategy), while unrestricted women showed the opposite pattern. Similarly, another study in our laboratory found that women's affect and proceptive behaviour also changes across the menstrual cycle (or with changes in conception likelihood) as a function of STMO as predicted by PSTS theory (Teatero, Oinonen, & Mazmanian, manuscript in progress). That is, women with lower STMO show increased positive affect and mating-relevant behaviours when conception likelihood was higher while women with higher STMO showed the opposite pattern or a lack of cyclicity.

Given these findings and the research mentioned above, women's sociosexual orientation (i.e., STMO) may also be associated with their mating-relevant perceptions of other women. Furthermore, if sociosexuality predicts directional cyclical shifts in mating effort and reproductive tactics (i.e., PSTS), women's perceptions of other women (i.e., rival-related reproductive tactics) may also show PSTS patterns. Just as one-night stand interest and proceptivity show PSTS patterns, jealousy may play a role in women's perceptions of other women and may show a cyclical shift where the direction of the periovulatory tactic shift is based on the rater's sociosexuality.

Current Study

The research reviewed above suggests that women's perceptions of potential rivals change as a function of fertility status or conception likelihood across the menstrual cycle and that women have negative perceptions of revealingly dressed women. No published studies have examined whether perceptions of revealing dress shift with fertility or menstrual cycle phase, or whether women's mating orientation effects any fertility-related shifts in these perceptions. Thus, it was proposed that women's perception of potential rival attractiveness will change with fertility (i.e., conception likelihood) across the menstrual cycle. First, it was hypothesized that

women's perceptions of other women's (i.e., potential rivals) attractiveness change with fertility (Hypothesis 1a), with the direction of the shift being affected by STMO (Hypothesis 1b). Second, it was hypothesized that women perceive more (versus less) revealingly dressed women more negatively when the perceiving women are relatively more fertile in their menstrual cycle (Hypothesis 2a), with the direction of the shift again being affected by STMO (Hypothesis 2b). Third, it was hypothesized that, at higher versus lower fertility times of the menstrual cycle, women: (a) are more jealous of other women (i.e., potential rivals) (Hypothesis 3a), with the direction of the shift being affected by STMO (Hypothesis 3b), and (b) report feeling relatively more jealousy towards women dressed in a more (versus less) revealing manner (Hypothesis 4a), with the direction of the shift also being affected by STMO (Hypothesis 4b).

Method

Participants

A sample of 49 women (83.7% Caucasian) were included in the main analyses after the exclusion criteria were applied (see below). This sample included women who completed both sessions, and had complete data for each hypothesis, including complete scores on the main rating variables (e.g., attractiveness, negativity, jealousy, and relative jealousy), covariates, and grouping variables. Their mean age was 21.27 (SD = 5.07), with 36.6% being in a committed romantic relationship.

Women were recruited from a Canadian university, the local community and the Internet using social media (e.g., Facebook, reddit and Kijiji) to participate in a study examining perceptions of women ("The Perceptions of Women Study"). A total of 891 women aged 16 and over participated (M_{age} = 20.85 SD_{age} = 4.92, 82.0% Caucasian). Women who were 16 and 17 years of age (n = 32) were recruited only from the local university, given the low risk nature of

the study. No initial upper age limit was used for recruitment purposes. However, to examine the main hypotheses, only women who were current free-cyclers (i.e., no current use of HCs) were included in the analyses (n = 384). Additional exclusion criteria were applied (described below).

Within the sample of free-cycling women, those with the following demographics or characteristics were excluded from the analyses given a need to focus on a homogenous free-cycling heterosexual population of reproductively aged women: (a) age over 44 years of age (n = 9); (b) a sexual orientation score of four or greater on the Kinsey Heterosexual-Homosexual Rating Scale (Kinsey, 1974) (i.e., indicating equal heterosexuality and homosexuality or greater homosexuality than heterosexuality) (n = 38); (c) previous use of hormonal contraceptives less than two months prior to completing the questionnaire (n = 15); (d) possible or definite current pregnancy (n = 9); (e) current lactation (n = 5); (f) current peri- or post-menopausal status (n = 15); (g) irregular menstrual cycle lengths (i.e., < 25 or > 35 days in length, e.g., Blake, Dixson, O'Dean, & Denson, 2016) (n = 81); (h) medication use that could affect hormone levels (e.g., anti-psychotic medication, hormone replacement therapy medication, and thyroid medication) (n = 12), and (i) not having testing sessions in both a low and a high conception likelihood phase (see criteria below, n = 547). Some women may be accounted for more than once within the previous exclusion criteria.

Materials and Measures

Background Questionnaire. As in Study 1, the Background Questionnaire included questions regarding demographics (e.g., sex, age, education, ethnicity, and relationship status); the Sexual History Questionnaire (see Study 1); and the Hormonal Status Questionnaire (see Appendix G) (i.e., items regarding women's reproductive status, such as menstrual cycle day, pregnancy, lactation, menopausal status, and HC use). A question about menstrual cycle

regularity was used from Wilcox and colleagues (2001). The present study also included two scales/measures that were described in Study 1: the Multidimensional SOI (MDSOI) (Jackson & Kirkpatrick, 2007) and the Marlowe-Crown Social Desirability scale Short Form (MCSD-S) (Strahan & Gerbasi, 1972). The main scale, the Perception of Women Measure for women, was also included and is described below due to it's salience.

The Perception of Women Measure. As described in Study 1, the Perception of Women Measure was developed for this project to measure how women perceive other women who are dressed in a more versus less revealing manner. The measure was used in combination with 50 photographs of attractive women (2 each of 25 women) that were evaluated by the observing women. The measure contained two formats; a forced-choice format and a Likert-type format.

The forced-choice format involved presenting women with 25 pairs of photographs of attractive women (i.e., 50 photographs total). Each pair consisted of one photograph of an attractive woman in a less revealingly dressed manner (e.g., clothing that shows less skin and is less body conforming) and another photograph of the same attractive woman in a more revealingly dressed manner (e.g., highly revealing clothing that is tight, body conforming and skin revealing). Similar to Welling and colleagues (2008), the forced-choice format asked women questions using an 8-point Likert-type scale. The questions we used were: (1) which woman do you find more attractive (i.e., photograph of less revealingly dressed woman "1 - *much more attractive*" to photograph of high revealingly dressed woman "8 - *much more attractive*"); (2) which woman are you more interested in being friends with (i.e., photograph of less revealingly dressed woman "1 - *much more interested in being friends with*" to photograph of high revealingly dressed woman "8 - *much more interested in being friends with*"); (3) which woman would you be more jealous of if the woman was talking to your partner (current or future

partner) (i.e., photograph of less revealingly dressed woman "1 - *much more jealous of*" to photograph of high revealingly dressed woman "8 - *much more jealous of*"); and (4) which woman do you view more negatively (i.e., photograph of less revealingly dressed woman "1 - *much more negatively*" to photograph of high revealingly dressed woman "8 - *much more negatively*"). These four items were used to calculate the forced-choice revealing dress scores across the 25 pairs of photographs.

After completing the forced-choice questions, women rated each of the photographs used in the previous condition (i.e., 50 photos of 25 women) on 11 attributes using a 10-point Likert-type scale, ranging from 1 (*not at all*) to 10 (*extremely*). Women were asked to rate each photograph for the following: (1) attractiveness; (2) trustworthiness; (3) femininity; (4) promiscuity; (5) niceness; (6) intelligence; (7) how interested you would be in being friends with the woman; (8) how jealous you would feel if the woman were to talk to your partner (current or future); (9) how attracted you think your partner (current or future) would be to the woman; and (10) how flirtatious you think the woman would act towards your partner (current or future). Women were also asked to rate how attractive they think each photographed woman is in comparison to themselves (1 [*she is much more attractive than me*] to 10 [*I am much more attractive than her]*). These 11 questions made up the Likert-type rating subscale of the Perception of Women Measure and were used to calculate mean Likert-rating scores and Likert-rating difference scores for revealing dress perceptions of the 50 photographs (see below).

Short-Term Mating Orientation. The Multidimensional SOI (MDSOI) (Jackson & Kirkpatrick, 2007) was used to assess mating psychology and behaviour with regards to STMO. This sociosexuality scale includes a subscale that measures STMO, which was included within the current study as a measure of women's ST mating interest and behaviours. The measure

includes 10 items that assess attitudes toward spontaneous and short sexual encounters or relationships without a strong emotional bond. The questions ask whether a person agrees or disagrees with particular statements (e.g., "I can easily imagine myself being comfortable and enjoying 'casual' sex with different partners"). For the current study, women were categorized into two STMO groups (low = ≤ 28, high = ≥ 29) using a median split. Mean STMO scores for these two groups were 17.66 (*SD* = 6.09) and 42.31 (*SD* = 11.53), respectively.

Measures of hormonal status. Items assessing women's self-reported menstrual cycle length, cycle regularity (i.e., Wilcox et al., 2001), first day of last menstruation, and predicted start day of next menstrual period from the Hormonal Status Questionnaire were used along with published data on conception likelihood (e.g., Wilcox et al., 2001) to determine probability of conception at the time of completing each of the two study sessions. Two additional questions from the Hormonal Status Questionnaire were also used to verify cycle day: "How confident are you that your next period will start on the day indicated above?" and "Are you menstruating (i.e., having your period) today?" Information pertaining to medical and psychiatric diagnoses as well as hormonal contraceptive use, medication use, and pregnancy were also used to determine hormonal status and whether women met exclusion criteria (noted above).

Calculation of cycle day. Using Microsoft Excel for Windows, self-reported dates of last and next menses, as well as the dates that women completed the questionnaire for both sessions, were converted into date values. The date value function in Microsoft Excel converts a date that is stored as text into a serial number. Using the default date system in Microsoft, the date text function represents a date between January 1, 1900 and December 31, 9999. By default, January 1, 1900 is serial number 1, while January 1, 2008 for example is serial number 39448 because it is 39,447 days after January 1, 1900.

To compute the forwards day count for the first session, the date value of women's reported last menses was subtracted from the value date of when women completed the session. For example, if a woman reported that her last menses started on September 9, 2015 (date value 42256) and she completed the first session on September 15, 2015 (date value 42262), her menstrual day based on the forwards count method (session one completion date minus last menses start date) is 7. The same process was used to determine women's forwards day count method for the second session. Forward day counts were calculated given that the conception likelihood estimates of Wilcox and colleagues (2001) were based on these.

Additional criteria were used to maximize the reliability and validity of menstrual cycle day data included in analyses. Women who met three or more of the following five criteria were excluded from the menstrual cycle analyses: (1) a report that she is currently menstruating yet her forward count cycle day is greater than seven; (2) a report that she is not currently menstruating and her forward count cycle day is less than six; (3) a woman's cycle forward count cycle day is off by five or more days from her self-reported cycle day; (4) a woman is less than 75% confident in her reported last and next menses dates; and (5) the difference between a woman's last menses start date and next menses start date is not within two days of her self-reported menstrual length. Applying this post-hoc exclusion criteria maximized the accuracy of cycle day data. The above reliability checks, as well as hand calculations of menstrual cycle day for a select number of women, were also used to double check day counts in order to assure accuracy in calculating cycle day.

Calculation of conception likelihood. As mentioned above, conception likelihood was based on the estimates reported in Wilcox and colleagues (2001), where estimates are based on cycle regularity and day of cycle using a forwards count. Thus, women's forwards count cycle

day data (see above) were used to estimate conception likelihood. Based on Wilcox and colleagues' table of estimates, each woman received a conception likelihood estimate based on their current cycle day (ranging from day 1 to 40) and cycle regularity (i.e., regular or irregular). Women who were beyond day 35 of their cycles did not receive a conception likelihood estimate and were excluded from analyses (e.g., Blake et al., 2016)

In the maximum sample of women included in the cyclical analyses, the mean conception likelihood estimate for the first session was 0.029 (SD = 0.028, range: 0.000 to 0.094, n = 105) while the mean for the second session was 0.025 (SD = 0.028, range: 0.000 to 0.094, n = 105). A paired sample t-test indicated that the conception likelihood estimates for the first and second sessions did not significantly differ, $t(104) = 1.02$, $p = .31$. The mean age of these women was 21.34 (SD = 4.74), with 81.0% being Caucasian, and 40.0% reporting to be in a committed romantic relationship. For each session, women were categorized into two groups based on conception likelihood [low ≤ .011, high ≥.015]. Low fertility corresponded with days 1 to 6 (i.e., menstrual phase) and 24 to 35 (i.e., luteal phase), while high fertility corresponded with days 7 to 23 of the menstrual cycle (an extended periovulatory phase) based on Wilcox and colleagues (2001). Only women with one session completed in the low fertility range and one session completed in the high fertility range were included in analyses. The conception likelihood ranges were chosen to maximize both sample size and fertility differences between testing sessions. The mean conception likelihood estimate for the low fertility phase was 0.005 (SD = 0.004, n = 49), while the mean for the high fertility phase was 0.054 (SD = 0.027, n = 49). A paired sample t-test indicated that the conception likelihood estimates for low and high fertility differed significantly, $t(48) = 11.43$, $p < .001$.

Procedure

Women completed the study online by clicking on an Internet link leading them to a secure SurveyMonkey website. The site included an added precaution to enhance security as all responses were encrypted (Secure Sockets Layer [SSL]). Women were asked to complete the first session at a time of day at which they would also be able to complete the second session two weeks later. Women first read the relevant Cover Letter and completed the Consent Form (see Study 1 for online and laboratory versions). Women first completed the background questionnaire, then the Perception of Women Measure where they evaluated 50 photographs of women on the 15 dimensions using the forced-choice (4 questions) and Likert-rating (11 questions) methods. Lastly, women completed the measure of STMO (MDSOI) and the measure of social desirability (MCSD-S). Each session took approximately 60 minutes to complete. A Debriefing Form for the first session was presented after completion of the first session (see Study 1). Women who provided an email address were invited to complete the second session two weeks later. A two-week interval between the testing sessions was selected for three reasons: (1) to provide a consistent test-retest interval for all women and to minimize carryover effects; (2) to help ensure that women were in two different cycle phases (e.g., menstrual and periovulatory, periovulatory and late luteal, early luteal and menstrual); and (3) to maximize the conception likelihood difference between the two sessions. Women were contacted 12 days after they completed the first session and invited to complete the second session within 48-hours. If women did not complete the second session within the designated time frame, a second email was sent two days later to remind them about completing the second session. A Final Debriefing Form for the second session was provided after completing the second session of the study (see Study 1).

For Hypothesis 1, mean attractiveness scores were computed across all photos for Likert-rating attractiveness items of each photograph at low and high conception likelihood times. For Hypothesis 2, mean forced-choice negative evaluation scores were computed at both low and high conception likelihood sessions. Higher scores reflect a relatively more negative perception of the women dressed in a more (versus less) revealing manner. For Hypothesis 3, mean jealousy scores were calculated from Likert-rating jealousy items of each photograph, and were computed at both low and high conception likelihood times. Finally, for Hypothesis 4, jealousy difference scores were calculated using the Likert-ratings of jealousy for both low and high revealingly dressed women. Specifically, the Likert-rating jealousy scores for less revealingly dressed women were subtracted from the Likert-rating jealousy scores for more revealingly dressed women. Higher scores reflect greater jealousy for the women dressed in a more revealing manner.

Examination of Statistical Test Assumptions

Prior to analyses, the data were screened for errors at entry, missing values, and univariate outliers. As recommended by Tabachnick and Fidell (2007), scores that were three deviations above or below the mean were treated as outliers (i.e., $\pm z \geq 3.29$). No outliers were detected on any of the main rating scales.

Scatterplots were used to examine linearity of the relationships between the variables. Linearity appeared to be satisfactory. Skewness and kurtosis were calculated for each item rating and subscale by dividing the item statistic by the standard error. Items with a *z*-score above three were considered to be skewed or kurtosed (i.e., $\pm z \geq 3$) (Tabachnick & Fidell, 2007). All the scales used to analyze the hypotheses were neither skewed nor kurtosed.

For the purposes of the main analyses, analyses with $p < .05$ were considered to be significant. All means reported in the tables are unadjusted, while means in the text or depicted in figures are adjusted for covariates (age, relationship status, and social desirability scores).

Prior to examining the hypotheses, the possibility of session effects with any of the dependent variables (i.e., ratings of attractiveness, negative perception of revealing dress, jealousy, and jealousy of revealing dress) was first examined. Repeated-measures analyses of covariance (ANCOVA) were conducted on the relevant dependent variables to test for any session effects (i.e., practice or order effects). If there was no effect of session, the relevant repeated-measures data were reorganized from the session categories (first, second) to the conception likelihood categories (low, high). Next, within-subjects ANCOVAs were conducted with conception likelihood (low, high) as the independent repeated measures variable and the relevant rating score as the dependent variable. Mean scores for the low and high conception likelihood groups were computed for each woman for the following dependent variables: forced-choice negative scores; as well as Likert-rating attractiveness and jealousy scores, and Likert-rating difference jealousy scores.

Results

Preliminary Analyses

Group differences between women low versus high on STMO were examined. Independent sample *t*-tests or chi-squared tests indicated that women in the low and high STMO groups did not differ in terms of age, relationship status (i.e., partnered versus single), social desirability scores (i.e., MCSD-S scores), or conception likelihood estimates at low and high fertility (all $p > .05$). Nevertheless, age, relationship status, and social desirability scores were included as covariates in all subsequent analyses due to evidence that these demographic

variables were associated with the main variables (e.g., a session X social desirability effect, $F(1, 44) = 6.06$, $p = .02$, and a trend for a session X age effect, $F(1, 44) = 3.56$, $p = .06$, for jealousy ratings). Women scoring higher on social desirability showed a greater decrease in jealousy scores between the first and second sessions than those lower on social desirability. Past research has also indicated that women in LT romantic relationships are more likely to use competitor derogation strategies than those who are single (e.g., Fisher & Cox, 2011; Fisher et al., 2009). Social desirability has also been found to significantly interact with the use of competitor derogation strategies, such that women who score higher on social desirability report using fewer competitor derogation tactics (e.g., Fisher et al., 2009), Thus, these three variables were included as covariates.

As mentioned above, repeated measures ANCOVAs were conducted to compare the effect of session on all four of the main rating scores from the first and second sessions. There was no evidence of a session effect for any of the rating scores (see Table 3.1 for means and standard deviations, and *F*-statistics). Thus, the scores were reorganized from the session categories (first, second) to the conception likelihood categories (low, high).

Hypothesis 1: Ratings of potential rival attractiveness as a function of conception likelihood and STMO. To examine whether women's ratings of other women's attractiveness changed with conception likelihood (low, high) (H1a), as well as whether women's mating orientation affects the relationship between conception likelihood and ratings of potential rival attractiveness (H1b), a mixed design 2 between (STMO: low, high) X 2 within (conception likelihood: low, high) ANCOVA was conducted using mean Likert-rating attractiveness scores (see the top section of Table 3.2 for means and standard deviations).

Table 3.1

Examination of Practice or Session Effects: Unadjusted Means, Standard Deviations, and F-tests of Ratings Scores for Sessions 1 and 2

Rating Scores	Session 1 Mean (*SD*)	Session 2 Mean (*SD*)	*N*	*F*	*df*	*p*
H1: Attractiveness[a]	4.78 (0.75)	4.64 (0.71)	48	0.64	1, 44	.427
H2: Negativity[b]	5.39 (0.57)	5.38 (0.65)	48	0.01	1, 44	.918
H3: Jealousy[a]	5.36 (1.75)	4.98 (1.65)	48	0.00	1, 44	.985
H4: Relative Jealousy[c]	1.03 (0.77)	1.09 (0.86)	48	0.01	1, 44	.914

[a] indicates mean Likert-rating scores
[b] indicates mean forced-choice scores
[c] indicates difference Likert-rating scores

Table 3.2

Unadjusted Means and Standard Deviations for the Main Rating Scale Scores as a Function of Conception Likelihood (CL: Low, High) and Short-Term Mating Orientation (STMO: Low, High) Groups

	Conception Likelihood		
	Low	High	Overall
	H1: Attractiveness Ratings (n = 48)		
Low STMO	6.35 (1.64)	6.53 (1.35)	6.44 (1.50)
High STMO	5.98 (1.42)	5.70 (1.10)	5.84 (1.26)
All Women	6.18 (1.54)	6.15 (1.30)	6.17 (1.39)
	H2: Negativity Ratings (n = 48)		
Low STMO	5.44 (0.53)	5.49 (0.63)	5.47 (0.58)
High STMO	5.31 (0.63)	5.28 (0.63)	5.30 (0.63)
All Women	5.38 (0.57)	5.39 (0.63)	5.39 (0.60)
	H3: Jealousy (n = 48)		
Low STMO	5.20 (1.64)	5.43 (1.58)	5.32 (1.61)
High STMO	5.10 (1.96)	4.90 (1.71)	5.00 (1.84)
All Women	5.16 (1.77)	5.19 (1.64)	5.18 (1.71)
	H3: Relative Jealousy (n = 48)		
Low STMO	1.31 (0.93)	1.20 (0.76)	1.26 (0.85)
High STMO	0.79 (0.77)	0.85 (0.67)	0.82 (0.72)
All Women	1.07 (0.89)	1.04 (0.73)	1.06 (0.81)

Note. "Overall" refers to the mean rating scale scores for low STMO (n = 26), high STMO (n = 22) and all (combined) women regardless of fertility status.

There was no main effect of conception likelihood on attractiveness ratings, $F(1, 43) = 0.00$, $p = .97$, suggesting that women's ratings of a rival's attractiveness does not change with conception likelihood. There was also no main effect of STMO group, $F(1, 43) = 0.44$, $p = .51$. However, there was a non-significant trend for an interaction between conception likelihood and STMO group on ratings of potential rival attractiveness, $F(1, 43) = 3.94$, $p = .05$. The trend was for women low on STMO to rate potential rivals as more attractive during high ($M = 6.40$, $SD = 1.34$) versus low ($M = 6.19$, $SD = 1.14$) conception likelihood times, while women high on STMO showed the opposite pattern with higher rival attractiveness ratings at low ($M = 6.16$, $SD = 1.25$) versus high ($M = 5.86$, $SD = 0.99$) conception likelihood (see Figure 3.1).

Hypothesis 2: Negative ratings of revealingly versus nonrevealingly dressed women. Hypothesis 2 examined whether women perceive other women dressed in a more (versus less) revealing manner more negatively when the perceiving women are at the relatively high (versus low) conception likelihood times of the menstrual cycle (H2a), and whether STMO affects the overall relationship between conception likelihood and negative perceptions of revealing dress (H2b). A mixed design 2 between (STMO: low, high) X 2 within (conception likelihood: low, high) ANCOVA was conducted, using the forced-choice negativity scores (see second section of Table 2 for means and standard deviations). There was a main effect of conception likelihood on negativity ratings, $F(1, 43) = 5.54$, $p = .02$, as women evaluated high (compared to low) revealingly dressed women more negatively at high versus low conception likelihood times (see Figure 3.2). There was no main effect of STMO group on negativity ratings, $F(1, 43) = 2.75$, $p = .10$. There was also no interaction between STMO group and conception likelihood on negativity ratings, $F(1, 43) = 0.08$, $p = .78$.

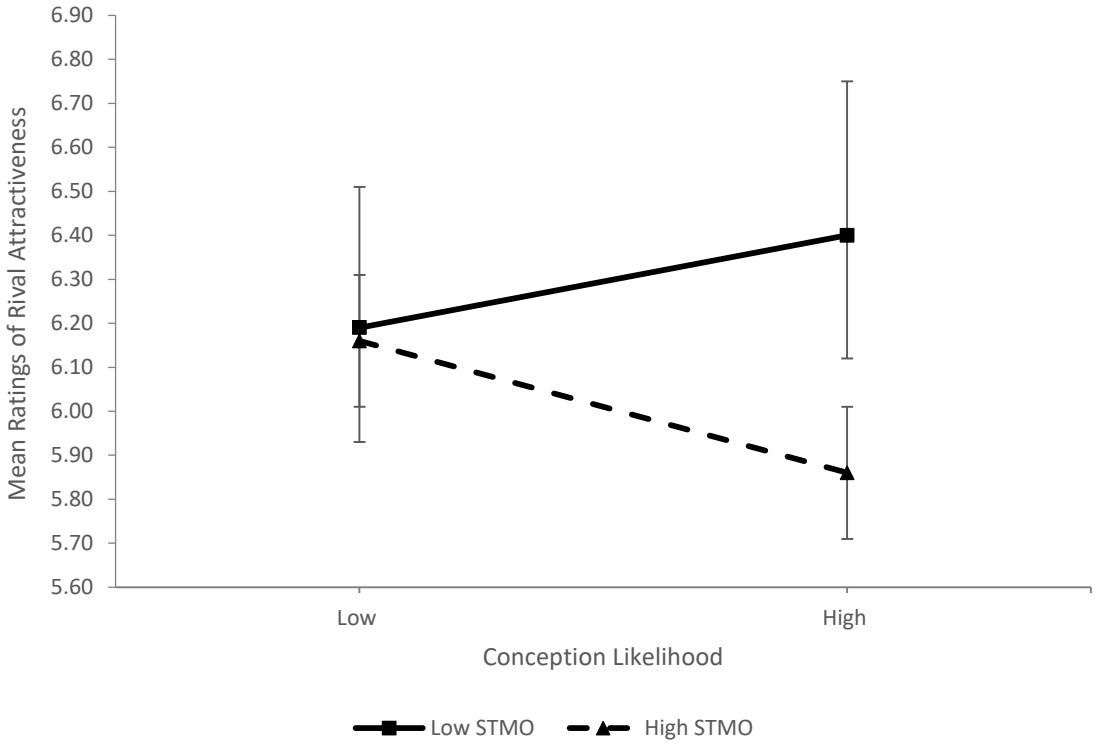

Figure 3.1. Line Graph Indicates a Trend for an Interaction between Conception Likelihood and Women's Short-Term Mating Orientation (STMO) on Ratings of Potential Rival Attractiveness, $F(1, 43) = 3.94$, $p = .05$. Data points are adjusted for the following covariates: age, social desirability scores, and relationship status. The interaction trend suggests that increases in conception likelihood are associated with increases in ratings of rival attractiveness for women low on STMO, but with decreases in ratings of rival attractiveness for women high on STMO. Error bars reflect the standard error of the mean (SEM) and are only useful for making inferences about differences between the STMO groups (i.e., not relevant when comparing low and high conception likelihood phases within groups) (Cumming & Finch, 2005).

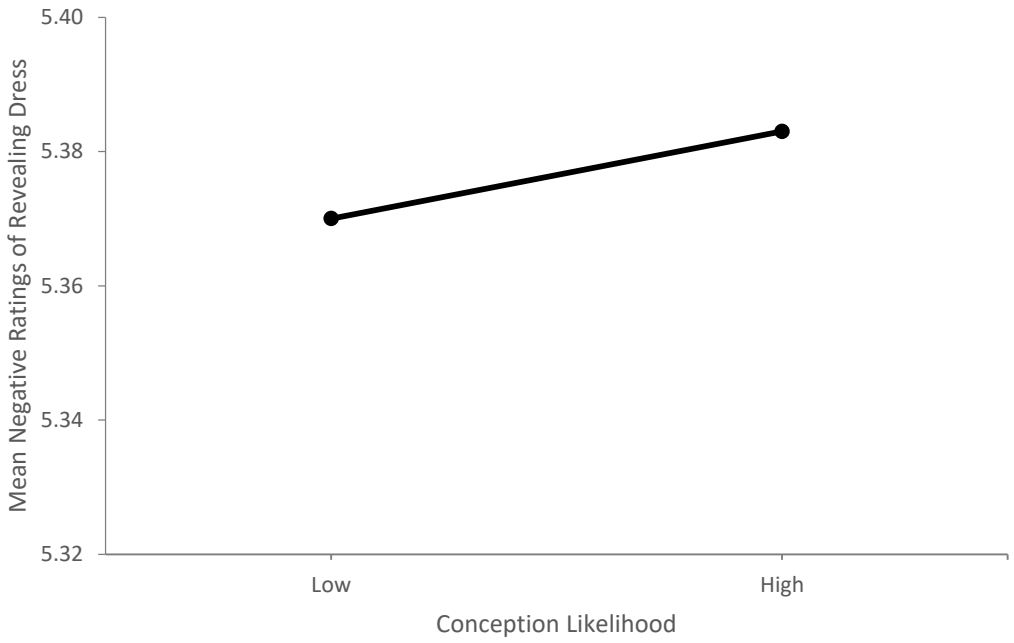

Figure 3.2. Line Graph Indicates a Significant Effect of Conception Likelihood (low, high) on Women's Negative Ratings of Revealing Dress, $F(1, 43) = 5.54$, $p = .02$. Data points are adjusted for the following covariates: age, social desirability scores, and relationship status. Negative perception ratings are based on the forced choice ratings with higher scores reflecting a more negative perception of women dressed in a high (versus low) revealing manner and lower scores reflecting the opposite. The graph illustrates the finding that women view revealingly dressed women negatively (i.e., scores > 5) and that this negative bias against revealingly dressed women is even stronger when the perceiving women are at higher (vs. lower) conception likelihood times of the menstrual cycle.

Hypothesis 3: Jealousy as a function of rater conception likelihood and STMO. Hypothesis 3 examined whether women are more jealous of other women (regardless of dress) when the perceiving women are at higher (rather than lower) conception likelihood times of the menstrual cycle (H3a) and whether STMO is associated with the relationship between conception likelihood (low, high) and jealousy ratings (H3b). A mixed design 2 between (STMO: low, high) X 2 within (conception likelihood: low, high) ANCOVA was conducted with jealousy scores as the dependent variable (see section 3 of Table 3.2 for means and standard deviations). There was a significant main effect of conception likelihood on jealousy scores, $F(1, 43) = 5.90$, $p = .02$. Means indicated that women experience more jealousy of potential rivals at high compared to low conception likelihood times (see Figure 3.3). There was no main effect of women's STMO group on jealousy scores, $F(1, 43) = 0.52$, $p = .48$. However, there was a significant interaction between women's STMO group and conception likelihood on jealousy scores, $F(1, 43) = 5.01$, $p = .03$. Means showed that women low on STMO experience more jealousy during high ($M = 5.48$, $SD = 1.17$) compared to low conception likelihood ($M = 5.20$, $SD = 1.24$) cycle days, while women high on STMO show the opposite with higher jealousy scores at low ($M = 5.11$, SD = 1.35) versus high ($M = 4.83$, $SD = 1.28$) conception likelihood (see Figure 3.4).

Hypothesis 4: Jealousy of revealingly-dressed women as a function of conception likelihood and STMO. Hypothesis 4 examined whether women indicate feeling relatively more jealous of high (versus low) revealingly dressed women at high compared to low conception likelihood days of the menstrual cycle. Likert-rating difference jealousy scores were computed by subtracting the jealousy scores for the less revealingly dressed women from jealousy scores for the more revealingly dressed women (i.e., higher scores reflected relatively

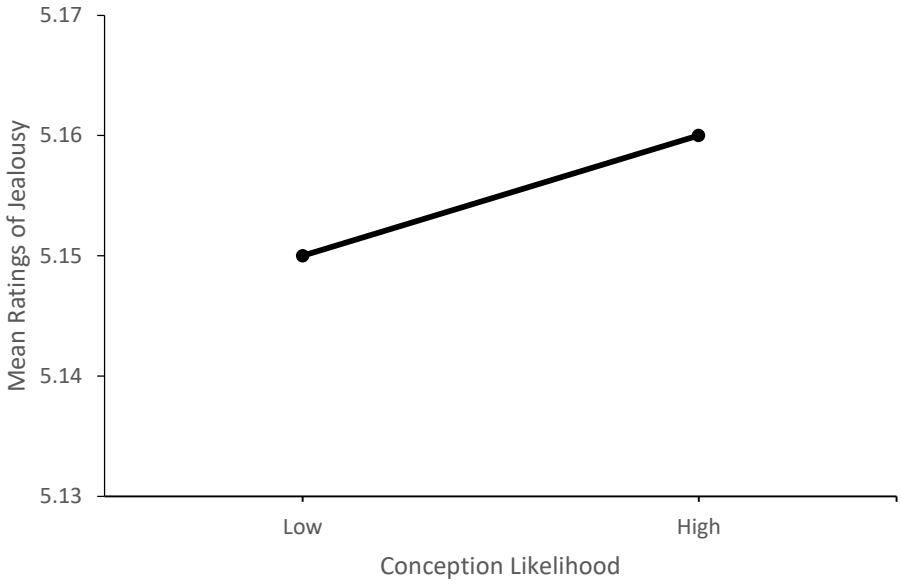

Figure 3.3. Line Graph Indicates a Main Effect of Conception Likelihood on Ratings of Jealousy of Potential Rivals, $F(1, 43) = 5.90$, $p = .02$. Data points are adjusted for the following covariates: age, social desirability scores, and relationship status. The main effect suggests that women report feeling more jealous of photographs of other women when the evaluating women are at high versus low conception likelihood menstrual cycle days.

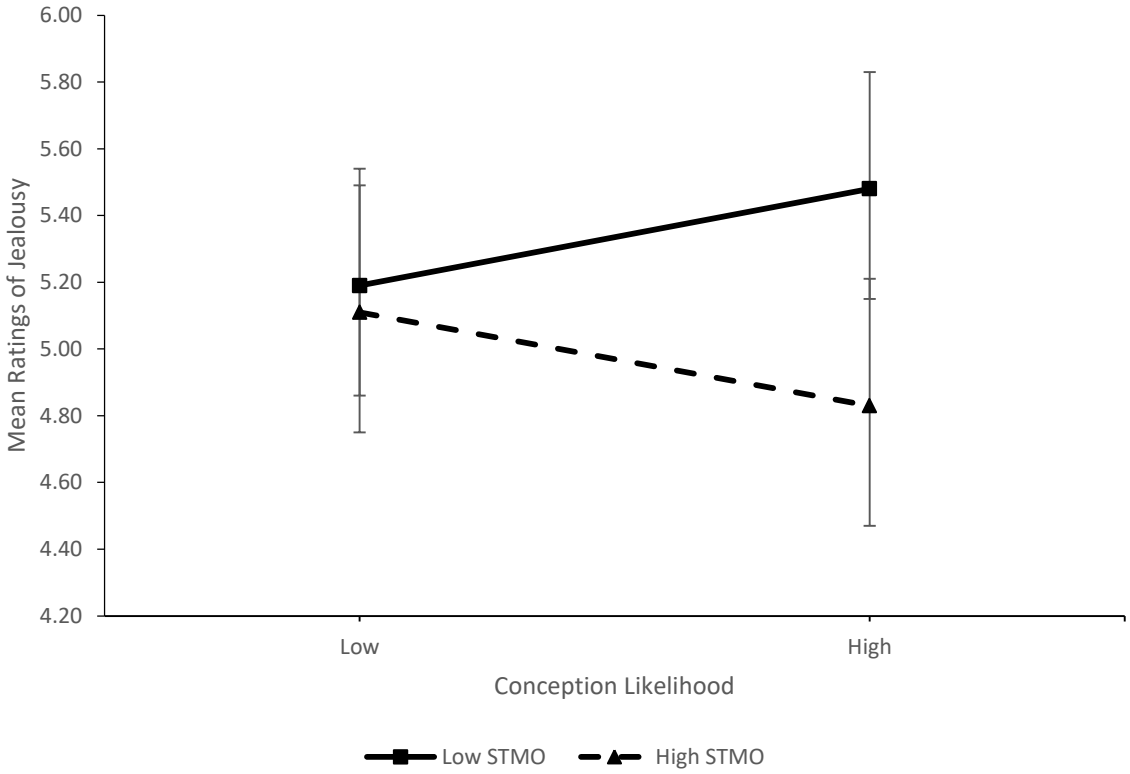

Figure 3.4. Line Graph Indicates an Interaction between Women's Short-Term Mating Orientation (STMO: low, high) and Conception Likelihood (low, high) on Ratings of Jealousy of Potential Female Rivals. Data points are adjusted for the following covariates: age, social desirability scores, and relationship status. The interaction effect, $F(1, 43) = 5.01$, $p = .03$, suggests a pattern whereby increases in conception likelihood are associated with increases in ratings of jealousy of potential rivals for women low on STMO, but with decreases in jealousy of potential rivals for women high on STMO. Error bars reflect the standard error of the mean (SEM) and are only useful for making inferences about differences between the STMO groups (i.e., not relevant when comparing low and high conception likelihood phases within groups) (Cumming & Finch, 2005).

greater jealousy of revealingly-dressed women). A mixed design 2 between (STMO: low, high) X 2 within (conception likelihood: low, high) ANCOVA was conducted to examine the effect of conception likelihood (low, high) on the jealousy difference scores of higher versus lower revealingly dressed women (H4a), as well as to examine whether STMO interacts with conception likelihood on women's jealousy of revealingly dressed women (H4b). Likert-rating difference jealousy scores served as the dependent variable. There was no main effect of conception likelihood on jealousy difference scores, $F(1, 43) = 0.18$, $p = .68$. However, there was a significant main effect of STMO on jealousy difference scores, $F(1, 43) = 5.87$, $p = .02$, indicating that women low on STMO were relatively more jealous of revealingly dressed women ($M = 1.31$, $SD = 0.53$) than women high on STMO ($M = 0.76$, $SD = 0.57$) (see Figure 3.5). There was no interaction between conception likelihood and STMO group on women's relative ratings of jealousy towards high versus low revealingly dressed women, $F(1, 43) = 1.23$, $p = .29$.

Discussion

Summary of Findings

Changes in women's conception likelihood across the menstrual cycle were not associated with changes in their ratings of other women's attractiveness, suggesting a lack of support for Hypothesis 1a. However, there was a trend for an interaction between STMO and conception likelihood on women's attractiveness ratings of potential rivals, partially supporting Hypothesis 1b. Hypothesis 2a was supported by the finding that women evaluated revealingly dressed women more negatively when conception likelihood was high compared to when it was low. There was no interaction between STMO group and conception likelihood on the negative perception of high (versus low) revealingly dressed women, suggesting no support for Hypothesis 2b. However, a main effect of STMO group indicated that women low on STMO

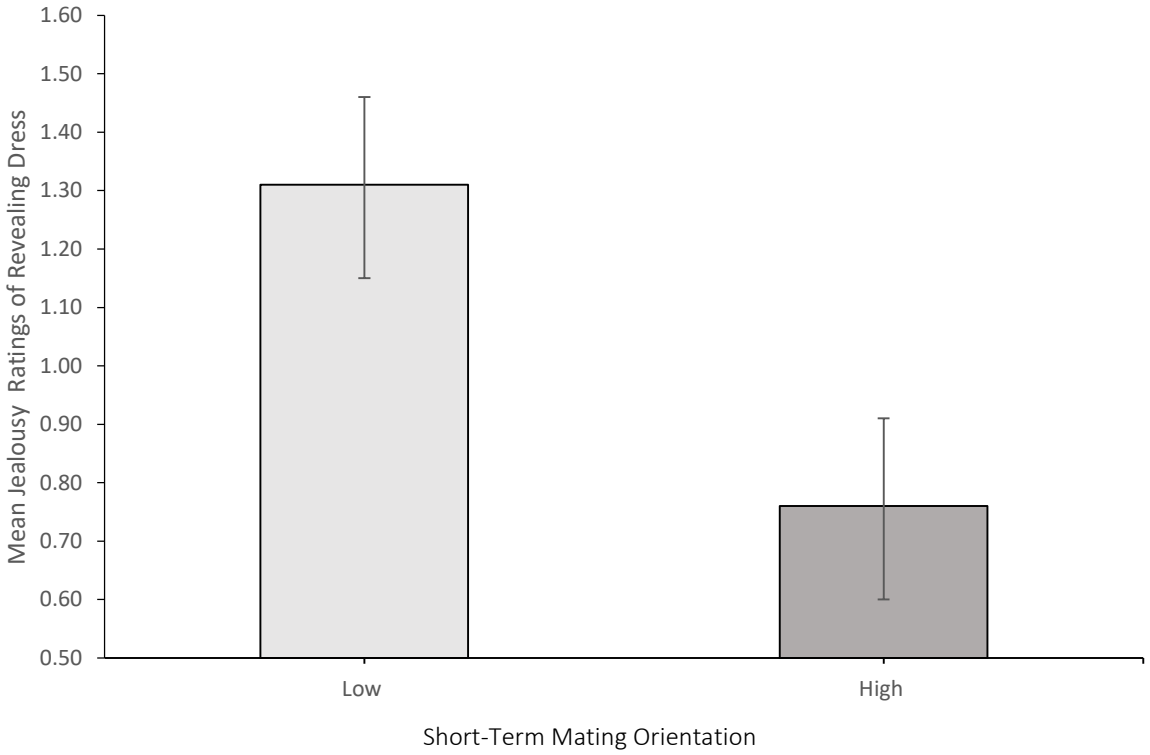

Figure 3.5. Bar Graph Indicates an Effect of Short-Term Mating Orientation (low, high) on Ratings of Relative Jealousy of Revealingly Dressed Women, $F(1, 43) = 5.87$, $p = .02$. The effect suggests that women low on STMO reported feeling relatively more jealous of revealingly dressed women than women high on STMO. Data points are adjusted for the following covariates: age, social desirability scores, and relationship status. Error bars reflect the standard error of the mean (SEM).

evaluated revealingly dressed women relatively more negatively than women high on STMO. Hypothesis 3a was supported by the finding that women are more jealous of potential rivals at high compared to low conception likelihood days. There was also a significant interaction between STMO group and conception likelihood on jealousy, providing support for Hypothesis 3b; women low on STMO experienced more jealousy of other women during high versus low conception likelihood cycle days, while women high on STMO showed the opposite pattern with higher jealousy scores at low versus high conception likelihood days (full support for Hypothesis 3). Finally, there was no evidence of an effect of conception likelihood (Hypothesis 4a) or a STMO group by conception likelihood interaction (Hypothesis 4b) on women's relative jealousy towards higher (versus lower) revealingly dressed women (no support for Hypothesis 4). However, a main group effect revealed that women low on STMO (restricted women) were more jealous of revealingly dressed women than were women high on STMO (unrestricted women), independent of conception likelihood.

Hypothesis 1: Directional Fertility Shifts in Women's Attractiveness Ratings of Potential Rivals Depend on Short-Term Mating Orientation

There was no support for the hypothesis that fertility affects attractiveness ratings; women as a group do not show a common pattern of perceiving other women (i.e., potential rivals) as more or less attractive with changes in the perceiving women's fertility. These findings are inconsistent with a previous finding that women in the fertile phase of the menstrual cycle rate other women's facial attractiveness significantly lower than women in non-fertile phases of the menstrual cycle (Fisher, 2004). However, the different findings may be due to methodological differences between the two studies. The current study utilized a more powerful within-subjects design rather than a between-subjects design. Failing to assess women

prospectively across the menstrual cycle may mean that past results were a by-product of slight group differences between women who were fertile versus non-fertile at the time of study completion or the discrepant findings may reflect unique characteristics of the samples in the two studies. In addition, the current study involved rating the attractiveness of women's entire bodies (including faces), while the previous study involved ratings of women's faces.

While further research is needed, a nonsignificant trend does suggest that further research is needed on the possibility that women's evaluations of other women's attractiveness may change with conception likelihood as a function of sociosexuality or STMO. This hypothesis was developed based on the PSTS theory (Oinonen et al., 2008) and the nonsignificant trend interaction fits with that theory in that there was not an overall effect of fertility on attractiveness ratings, but instead a trend for STMO group differences in the change in attractiveness ratings with changes in fertility. The trend for an interaction between STMO and fertility on women's attractiveness ratings reflects a trend for women low on STMO (i.e., restricted women) to rate potential rivals as more attractive during high compared to low fertility cycle days, while women high on STMO (i.e., unrestricted women) tended to rate potential rivals as less attractive during high compared to low fertility cycle days. While focused on a different outcome variable, this pattern of findings is consistent with Oinonen and colleagues' (2008) original finding that restricted women show increased ST-oriented mating effort at high versus low fertility cycle phases whereas unrestricted women show the opposite pattern. The finding also fits well with Hill and Durante's (2009) finding that women experience a decrease in self-esteem at the high fertility cycle phase and that women with more LT mating motivation show an even greater decrease in self-esteem during this time. Their finding that women with a LT mating orientation show a decrease in self-esteem when fertility is high might be related to our finding that women

low on STMO evaluate potential rivals as more attractive during this same period. The drop in self-esteem at higher fertility may be one mechanism that causes LT oriented women (i.e., more restricted women) to evaluate potential rivals as more attractive. Hill and Durante also found that women with the greatest decrease in self-esteem at the high fertility phase also showed the greatest willingness to buy expensive items to increase their own attractiveness. Taken together, these findings suggest the possibility that at high fertility cycle days, women with higher LTMO and lower STMO show a decrease in self-esteem and an increase in perceived potential rival attractiveness. These shifts may help motivate mating-relevant self-enhancement behaviours (e.g., purchasing of expensive items that increase their own attractiveness) in order to increase their success as a chosen mate against other potential rivals. This possibility is discussed further below in the context of STMO-fertility dependent shifts in jealousy.

Competitor derogation is any act intended to decrease a rival's perceived mate value relative to one's self (Buss & Dedden, 1990). One tactic is to change one's perception of a potential rival's mate value. Women pursuing a ST mating strategy may describe same-sex rivals as unattractive or sexually restricted (e.g., "a prude"); whereas women pursuing a LT mating strategy may emphasize a potential rival's promiscuity, infidelity or dishonesty (Buss & Dedden, 1990). Women pursuing a strategy that is similar to a potential rival's may use conscious or unconscious self-deception or rationalization (e.g., telling oneself that the rival is not attractive) in an attempt to decrease the potential rival's mate value and increase their belief that they will be more successful at mating. Such a strategy would be most important or adaptive at higher fertility cycle days as it may provide an individual with the motivation or self-esteem to pursue higher valued mates when she believes that she has a chance of acquiring such a partner. This strategy may increase her chances of mating with a higher quality mate because she has a

lowered perception of her rival's value (Cox & Fisher, 2008) and potentially a relatively higher perception of her own mate value. The present trend for high STMO unrestricted women evaluating women as less attractive when at higher fertility cycle days is somewhat consistent with previous research by Schmitt and Buss (1996). While they did not look at the effect of fertility or conception likelihood on attractiveness ratings, they found that women pursuing a ST mating strategy tend to describe other women, whom they perceived as potential competitors, as ugly, whereas those pursuing a LT mating strategy emphasize a competitor's promiscuity. The current findings may extend Schmitt and Buss' findings by suggesting that the tendency for high STMO women to evaluate other women as less attractive may be more likely to occur at high (but not low) fertility cycle phases. Taken together with our other finding of a STMO X fertility effect on jealousy ratings (discussed below), the results suggest a pattern whereby, at high conception likelihood times, low STMO women view potential rivals as more attractive and are more jealous of them; whereas high STMO women view potential rivals as less attractive and are less jealous of them. One could speculate that, at high fertility phases, low and high STMO women are differentially motivated: low STMO women may benefit from jealousy as a motivator for mating effort whereas high STMO may instead benefit from a boost to their self-esteem to motivate mating effort. Further research is needed to examine this finding of a trend for a STMO X fertility interaction with respect to ratings of women's attractiveness. Two studies suggest that restricted women engage in more ST mating effort at higher (versus lower) fertility cycle days and that unrestricted women show an opposite pattern or no cyclical change (Oinonen et al., 2008; Phillips et al., manuscript in progress).

The present findings suggest there is value in continuing to explore the extent to which sociosexuality or STMO affect the relationship between women's conception likelihood and

their attractiveness ratings of potential rivals in a mating context. The findings suggest a trend for an interaction between STMO and fertility on women's evaluations of other women's attractiveness and provide some tentative support for PSTS pattern in women's evaluations of potential rivals.

Hypothesis 2: Women View Revealingly Dressed Women More Negatively when Conception Likelihood is High

The current study found that women rate revealingly dressed women more negatively during times of high (versus low) conception likelihood. This appears to be the first study to examine this research question. Previous research has found support for the hypothesis that women evaluate potential mate competitors negatively (Cox & Fisher, 2009). In addition, women who are dressed more revealingly are viewed as more likely to use sex as a tool to get what they want (Cahoon & Edmonds, 1989). It has also been found that women who dress more revealingly are judged to be less intelligent and less capable (i.e., more negatively) than those who dress in a less revealing manner in professional (Glick, Larsen, Johnson, & Brenstiter, 2005; Howlett, Pine, Cahill, Orakçıoğlu, & Fletcher, 2015), academic (Gille-Knauf, Mittag, & Oyster, 2008), athletic (Gurung & Chrouser, 2007), and general (Study 1) contexts. Cahoon and Edmonds (1989) also found that women rate other women who wear revealing or "sexy" clothing as being more flirtatious and more sexually open than the same women wearing less revealing clothing. The findings of Study 1 are consistent with their findings. To explain the findings, Cahoon and Edmonds suggest that there is a generally negative bias toward women wearing revealing clothing. Indeed, research has shown that revealingly dressed women are judged more harshly and negatively, however, this study is the first to examine and find that

women's negative perceptions of revealingly dressed women become even more pronounced with increases in conception likelihood.

Durante et al. (2008) found shifts in women's own clothing choice related to fertility status, with women showing greater preference for revealing clothing near ovulation. It is possible that, besides reflecting a general tendency to attempt to maximally attract men, shifts in clothing preference may reflect an increase in intrasexual competition near ovulation (i.e., strategic self-promotion to compete with other women). Thus, it is possible that ovulating women become more attuned to identify and negatively judge women who dress in a revealing fashion (who are potentially ovulating as well) in order to activate mate guarding tactics. This would be even more important if women recognize that the relevant woman is ovulating. Women's mate guarding may be functionally flexible; past findings suggest that women are sensitive to both personal (e.g., style of dress) and contextual (e.g., fertility) cues indicating whether other women might be likely and effective mate poachers (Krems, Neel, Neuberg, Puts, & Kenrick, 2016). Since ovulating (i.e., high-fertility) women are both more attractive to men (Bobst & Lobmaier, 2012; Puts et al., 2013) and more attracted to men (Pillsworth, Haselton, & Buss, 2004), ovulating and revealingly dressed women may be perceived to pose heightened threats to one's current or potential relationship. Thus, women in higher fertility times of the menstrual cycle may judge revealingly dressed women as more negative (i.e., indirect aggression through derogation) than less revealingly dressed women and even dehumanize potential rivals (e,g., Baenninger, Baenninger, & Houle, 1993; Lucas & Koff, 2013; Piccoli, Foroni, & Carnaghi, 2013) as a way to defend against losing one's potential or current mate to a poacher. These derogation tactics may take the form of a mean look, an aggressive or dismissive body posture, or a derogatory comment. The tactics may reduce women's willingness to pursue a potential

man, thus eliminating them from the rival pool. The usefulness of this strategy depends on women being able to accurately identify those who might be likely rivals. Thus, it makes sense that women negatively evaluate other women who dress in revealing clothing as they are perceived as sexually attractive to the opposite sex (Hill, Nocks, & Gardner, 1987). Since reproductive consequences of many behaviours depend on their timing in relation to a woman's fertile window, it would be most adaptive for women to have evolved to judge revealingly dressed women most negatively when the evaluating women are most fertile. If fertile ovulating women are more attuned to perceive potential rivals and more likely to engage in negative evaluation and competitor derogation with the goal of maximizing how men perceive their relative mate value, this adaptation would be likely to increase women's chances of successfully attaining a desirable mate.

Hypothesis 3: Directional Fertility Shifts in Women's Jealousy of Potential Rivals Depend on Short-Term Mating Orientation

The current study found that women reported feeling greater jealousy towards potential rivals at high versus low fertility. Even more interesting is the finding of a STMO by fertility interaction on the jealousy ratings. The finding that women experience greater jealousy towards other women at higher than lower fertility cycle days is in line with four previous studies (Cobey et al., 2012; Gaulin, Silverman, Phillips, & Reiber, 1997; Geary, Sheldon, & Cooper, 2001; Krug et al., 1996). Women may report greater jealousy when fertility is relatively higher because mating competition is most salient at this time, and they may therefore consciously or unconsciously monitor their partners to a greater extent. Previous research examining jealousy of attractive women in any context (i.e., not necessarily as a function of fertility) has used either vignettes or photographs to arouse feelings of jealousy (e.g., Massar & Buunk, 2009; Massar &

Buunk, 2010; Massar et al., 2009) The present study differed from the four other previous studies that also examined fertility and women's ratings of jealousy (i.e., Cobey et al., 2012; Gaulin et al, 1997; Geary et al., 2001; Krug et al., 1996) as we utilized photographs with a 10-point response scale to measure jealousy, included a larger sample size, and explored whether STMO moderated the effect of fertility on jealousy.

As mentioned, four other studies have examined changes in jealousy across the menstrual cycle, which has resulted in mixed findings based on the type of jealousy measured (e.g., sexual versus emotional jealousy) or the design of the study (e.g., between- versus within-subjects) and sample size. Using a within-subjects design, Krug and colleagues (1996) measured electrodermal activity and self-reported jealousy in response to infidelity scenarios during the menstrual, preovulatory, and midluteal phases with 16 free-cycling women. The researchers found that emotional jealousy was significantly higher in the preovulatory phase than the midluteal or menstrual phases, but sexual jealousy did not differ across the cycle. However, using a between-subjects design with 118 women, Gaulin and colleagues (1997) found that sexual jealousy was highest during the menstrual phase (i.e., when fertility is lower than at the preovulatory phase), while emotional jealousy was highest during the ovulatory phase. Additionally, using a within-subject design with 47 free-cycling women, Geary et al. (2001) found no differences in sexual versus emotional jealousy across the menstrual cycle, but found that relationship jealousy increased with estrogen levels. Also using a within-subjects design, Cobey et al. (2012) found that for both single and partnered women, jealousy scores were significantly higher when at fertile versus non-fertile phases of the menstrual cycle. Inconsistent findings in previous studies may be at least partly explainable by our STMO X conception likelihood findings. Though Krug et al., Geary et al., and Cobey et al. did not measure sociosexuality or interest in ST mating, it is

possible that they both had a sample comprised of women lower on STMO, which would explain their finding of a periovulatory peak in jealousy. This fits with our finding that low STMO women experience more jealousy at higher rather than lower fertility. On the other hand, Gaulin et al. may have had a sample comprised of higher STMO or unrestricted women, which would explain their menstrual peak in jealousy given our finding that high STMO women experience more jealousy at lower fertility.

The interaction between women's STMO (one's degree of unrestrictedness) and fertility on ratings of jealousy indicated that women low on STMO (restricted) experienced more jealousy during high versus low fertility cycle days, while women high on STMO (unrestricted) showed the opposite pattern with higher jealousy at low versus high fertility days. The findings fit well with PSTS theory, which posits that there is a periovulatory phase shift in sociosexual behaviour. This includes a shift towards more restricted sexual behaviour in unrestricted women and more unrestricted sexual behaviour in restricted women (Oinonen et al., 2008). Based on the PSTS theory and research on men's mate preferences, the current findings suggest that restricted women who switch to a more unrestricted sociosexuality during higher fertility cycle days may experience higher levels of jealousy towards potential rivals. Restricted women may have evolved to be more jealous of potential rivals at higher fertility days as this may activate mate-guarding or competitor tactics and maximize reproductive success. Thus, it is possible that restricted women who become more interested in ST mateships also experience more jealousy towards women when they are fertile because they now feel they are in competition with such women. Thus, a restricted or low STMO woman would benefit from a periovulatory increase in jealousy because engaging in mating competition during this time (e.g., fending off competitors) may increase her chances of acquiring or maintaining a relationship.

Conversely, if high STMO women increase their ST mating effort (e.g., proceptive behaviour) when they are less fertile, it also makes sense that they would be more jealous of other women during this time. Thus, unrestricted women may experience less jealousy at ovulation towards women as they are less focused on a ST strategy (more LT focused) and do not perceive other women as threats. An unrestricted woman would benefit from an upwards shift in jealousy during lower fertility cycle days as this would cue her as to who her potential rivals (i.e., other women perceived as pursuing the same strategy) are when she is most interested in ST mating, thus activating mating competition behaviours. It may also be adaptive for unrestricted women to experience less jealousy at high fertility cycle days because lower levels of jealousy may encourage friendship and affiliation with other women. PSTS theory posits that the strategy of a high STMO woman is to mate with a previous sexual partner during high fertility cycle days. While this is pure speculation, it may be that, when observed by previous sexual partners, friendship and affiliation with other women may provide these men with a signal of commitment or loyalty, which may increase the likelihood that men will re-mate with high STMO women if they desire such qualities in their partners. On high fertility days, high STMO women may benefit more from affiliation with other women and a boost to their own self-esteem than they would from increased jealousy. Thus, lower jealousy at the periovulatory phase in high STMO women may be adaptive in that it could enhance their sexual and mating success. Future research may want to examine whether women's friendship and affiliation with other women increases a high STMO woman's attractiveness to men as either a ST or LT mate.

Hypothesis 4: Relative Jealousy of High versus Low Revealingly Dressed Women Does Not Shift with Fertility

The current study did not find any support for the hypothesis that women indicate feeling relatively more jealous of women dressed in a revealing versus nonrevealing manner at higher versus lower fertility times of the menstrual cycle. Although Study 1 found that women report experiencing more jealousy towards high versus low revealingly dressed women, the current study did not find that this jealousy increased with fertility. Therefore, women are more jealous of high (versus low) revealingly dressed women, and this appears to be independent of conception likelihood. No previous published study has examined this question. A possible explanation for the lack of an effect of fertility on jealousy ratings of high (versus low) revealingly dressed women may be that women have a tendency to be more jealous of revealingly dressed women regardless of the context, which may overpower any potential effects of fertility status. Furthermore, it may be that it is more adaptive for women to experience a fertility-related increase in jealousy towards all attractive women as opposed to just an increase in jealousy that is preferential for the revealingly dressed attractive women. Given that all the photographs used in the current study were of attractive women, this finding could also be related to our examination of highly attractive potential rivals. Future research could examine the effects of fertility on jealousy of revealing dress with potential rivals who have lower levels of attractiveness.

There was no interaction between STMO and conception likelihood on relative jealousy ratings of higher versus lower revealingly dressed women. Again, this suggests that, regardless of their fertility status or their mating strategy, women experience greater jealousy of high (versus low) revealingly dressed women. Study 1 found that partnered women and women who use HCs report more jealousy towards high (versus low) revealingly dressed women than women who are single or do not use HCs. The current study only included free-cycling women and

relationship status was used as a covariate in the analyses. Future research could explore whether single versus partnered women experience differential changes in jealousy towards high compared to low revealingly dressed women across the menstrual cycle.

Periovulatory Sociosexuality Tactic Shift (PSTS) Theory

PSTS theory posits that a periovulatory phase shift in sociosexual behaviour includes a shift towards more restricted sexual behaviour in unrestricted women, and toward more unrestricted sexual behaviour in restricted women. The theory predicts that restricted women show a relatively greater periovulatory peak in mating-relevant behaviour towards ST mates who are high in physical attractiveness (i.e., good genes) during high fertility phases, as compared to unrestricted women. Our findings further support the PSTS theory by providing the first evidence that women's jealousy, and possibly their attractiveness evaluations of other women (i.e., potential rivals), shift with fertility as a function of sociosexual orientation (low versus high STMO). These findings add to past research indicating that women's one-night stand interest changes with fertility as a function of sociosexual orientation (see Oinonen et al., 2008).

The current study suggests: (1) PSTS theory can help to explain variation in women's feelings of jealousy towards other women both over time (across the menstrual cycle) and between women (low versus high STMO); and (2) there is a strong trend suggesting that PSTS theory may also explain individual differences in women's evaluations of other women's attractiveness and within-woman variations over time. The findings also suggest some potential mechanisms that may help drive PSTS patterns in women's mating behaviours. Specifically, cyclical shifts in women's sociosexual interest may influence women's jealousy and appraisal of another woman's attractiveness and these factors may help to partly explain the cyclical shifts observed in women's behaviours towards men, depending on the sociosexuality of the

individual. For instance, if a woman's sexual strategy involves an unrestricted sociosexual orientation, her strategy of relatively greater interest in LT mating when she is more fertile may be enhanced by the benefits of affiliation with other women or higher self-esteem that may be more likely to be experienced because she experiences lower feelings of jealousy towards women and lower attractiveness appraisals of other women.

Hormonal mechanisms may be driving the differential shifts in attitudes, interest and behaviour for high and low STMO groups of women whose sexual strategies seem differentially linked to their menstrual cycles. Research has found differential effects of hormones on mating behaviour and attitudes. For example, in a study that examined hormonal assays of testosterone, estrogen and progesterone to look at how hormones affect affiliation, it was found that in free cycling women with lower overall estrogen levels (compared to those with higher estrogen), progesterone was linked to stronger affiliation (Fleischan, Fessler, & Cholakians, 2015). Further analyses revealed that this was particularly pronounced for periovulatory and luteal progesterone, suggesting that progesterone may prime a temporary increase in the need for close, harmonious relationships, and possibly sexual contact, during a phase of the cycle in which an egg may be fertilized and become implanted in the uterine wall. The authors suggested that progesterone may facilitate behaviours aimed at establishing or solidifying social bonds with a partner and one's extended social group and thus ensure adequate support throughout a pregnancy.

Testosterone may also play a role in women's sexual motivation. For example, testosterone levels have generally been found to be positively related to sociosexuality between women (Edelstein, Chopik, & Kean, 2011). Estrogen has also been found to be positively related to sexual behaviour, while progesterone may inhibit desire and proceptivity across the cycle (Roney & Simmons, 2013). In addition, women with high levels of estradiol have been found to

prefer the scent of symmetrical men (Garver-Apgar, Gangestad, & Thornhill, 2008) and to prefer faces of men with high testosterone levels (e.g., Roney, Simmons, & Gray, 2011). Thus, it is possible that different women show different hormone-related shifts in sociosexuality that may influence their attitudes and interests in others.

While one can speculate that estradiol, testosterone, or progesterone may differentially affect sexual motivation in high and low STMO groups of women, research has not yet examined this issue and a full discussion of possible mechanisms is beyond the scope of this paper. Future research on hormonal or other biological mechanisms driving PSTS is needed.

As mentioned earlier, the two cyclical tactic shift strategies may have evolved in order to solve adaptive problems faced by women, such that a restricted woman may benefit from a periovulatory shift toward more unrestricted sociosexual behaviour during the most fertile part of her cycle if it results in offspring with high-quality traits. Conversely, an unrestricted woman may benefit from a periovulatory shift toward more restricted sociosexual behaviour during the most fertile phase of her cycle in order to help ensure investment from a previous and known partner (i.e., potential LT partner) if an offspring results from their copulation. The findings that low and high STMO women show differential cyclical shifts in attractiveness appraisal (trend) and jealousy of other women provide further evidence that these two groups of women differ in mating relevant behavioural shifts across the cycle. It also extends the PSTS findings to jealous emotions towards potential rivals and evaluations of potential rivals' attractiveness. The present findings suggest that, instead of just reflecting shifts in ST mating behaviour involving men, the opposing periovulatory shifts in behaviour for low and high STMO women may in fact reflect group differences in cyclical sensitivity to mating-relevant cues and in overall ST mating effort as it relates to the evaluation and assessment of potential female rivals.

Strengths, Limitations, and Future Directions

The current study had several strengths. It included a relatively large sample size for within-subjects menstrual cycle research and two methods (e.g., Likert-ratings and forced-choice ratings) to examine whether perceptions of women (potential rivals) change with fertility shifts across the menstrual cycle. This study also utilized a within-subjects design which is both more sensitive and valid than a between-subjects design for identifying fertility-related factors that affect women (i.e., conception likelihood). Furthermore, such a design is the only way to examine how such within-subject factors interact with differences between women to affect behaviour (i.e., interactions between fertility and STMO). The within-subjects design was also used in terms of the photographic stimuli presented to women. The use of the same women dressed in both a low and high revealing manner represented a more powerful controlled method of examining evaluations of low versus high revealing dress.

As is the case with much of the jealousy and menstrual cycle research, the study used a primarily undergraduate sample. While this sample has many advantages, the findings may not be generalizable to other populations. However, undergraduate samples are appropriate for this type of research because such women are generally healthy and in their fertile years. Also, use of a homogenous sample maximizes the likelihood of finding an effect when one exists. Nevertheless, it is important that the findings are replicated with older (yet pre-menopausal) and less educated samples; and also using potential rivals who vary in attractiveness. The use of strict participant exclusion criteria is a strength of this study as it improved the reliability of cycle day and conception likelihood data. However, it would also be useful to determine the generalizability of these findings to women with less regular menstrual cycles. As mentioned above, the current study utilized photographs of attractive models wearing ‘more revealing’ and

'less revealing' clothing. However, the women depicted in each of the photographs may be more attractive than the average woman (i.e., the mean attractiveness rating for all photographs was 6.16 [*SD* = 1.53] on a scale of 1 to 10). Thus, it would be interesting to examine whether the results remain the same when using photographs of average or below-average looking women wearing similar styles of clothing. Similarly, the photographed women and the female raters primarily included women who appear to be of European ancestry. Replication of the findings with a more ethnically diverse group of photographed women and raters is also recommended. This would strengthen the ecological validity of the results such that they would be more applicable to everyday interactions with a greater variety of women. The cycle days and calculation method (i.e., forwards count) chosen in the current study may also be a potential limitation. Days 7 to 23 corresponded to higher fertility days (i.e., an extended periovulatory phase) and days 1 to 6 corresponded to lower fertility days (i.e., the menstrual phase). An ideal method would have been to use backwards counts, ovulation detection, a narrow fertile window, and hormone assays. However, the current study utilized the forwards count method in order to be consistent with the day calculation method used by Wilcox and colleagues (2001) to calculate conception probability. In addition, the current study used strict inclusion criteria based on women's menstrual cycle data (e.g., the use of women with data in both the higher and lower fertility days, menstrual cycle length less than 35 days, 75% confidence in reported last and next menses dates) and a within-subjects design. These methods increased the reliability of the menstrual cycle data while also maximizing the sample, and thus power of the study design based on the available information.

Conclusion

Taken together, the findings of the current study provide evidence that at high (versus low) fertility times in their cycle: (1) women view revealingly dressed women relatively more negatively; and (2) women experience more jealousy towards all potential rivals (regardless of clothing style). In addition, there was evidence that the PSTS theory can help to explain within- and between-women variation in their attractiveness evaluations of other women (potential rivals), as well as jealousy of women. Women low on STMO rate potential rivals as more attractive (trend) and experience more jealousy during high (versus low) fertility cycle days, while women high on STMO rate potential rivals as less attractive (trend) and experience less jealousy at high (versus low) fertility cycle days. These findings suggest menstrual cyclicity in women's evaluations of revealing dress and in women's jealousy of potential female rivals; and that presence/absence of an unrestricted ST mating strategy affects the direction of menstrual cycle shifts in women's jealousy of potential rivals.

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Chapter 4:

General Discussion

General Discussion

While research suggests sex differences in mating strategies, within-sex differences exist as well, with very little research focussing on identifying individual attributes that predict these differences or mechanisms involved in within-sex or within-individual differences. Previous research suggests that cyclical changes in conception likelihood are associated with women's mate preferences and perception of potential mating rivals. Research also indicates that both men and women make attributions about a person's sociosexuality (i.e., interest in casual short-term relationships) based on style of dress (e.g., highly revealing clothing versus less revealing clothing). Very little research has examined revealing dress biases from an evolutionary perspective and past research has not examined whether biases about revealing dress change with conception likelihood. The primary aim of this two study dissertation was to better understand the factors that influence perceptions of women and biases about revealing dress (e.g., evaluation of potential rivals; intrasexual competition; competitor derogation). Specifically, Study 1 found support for revealing dress biases and found that mating-relevant personal attributes are associated with perceptions of women and revealing dress. Revealingly dressed women were judged as more attractive, feminine, promiscuous, and flirtatious; and less trustworthy, nice, and intelligent. In addition, women were less interested in being friends with revealingly dressed women, were more jealous of revealingly dressed women, reported that their partners would be more attracted to revealingly dressed women, and rated themselves as less attractive relative to revealingly dressed women. Sexual orientation, sociosexuality, long-term mating orientation, body-esteem, relationship status, virginity status, and hormonal contraceptive use were all associated with specific revealing dress biases. Study 2 provided evidence that fertility (low vs. high) and mating orientation (high versus low short-term mating orientation: STMO) are

associated with perceptions of women. While women's evaluation of other women's attractiveness did not change with fertility of the rater, women viewed revealingly dressed women more negatively when fertility was high versus low. Women also experienced more jealousy towards all potential rivals (regardless of clothing style) at higher versus lower fertility cycle phases. In addition, women low on short-term mating orientation (STMO) experienced more jealousy towards all potential rivals during higher versus lower fertility phases, while women high on STMO showed the opposite pattern (i.e., experienced less jealousy towards them at high versus low fertility phases).

This dissertation was also an attempt to integrate theories and research on perceptions of women's revealing style of dress with evolutionary psychology. While past research has indicated that women who wear revealing clothing are judged more negatively, as more sexually appealing, more attractive, less faithful in marriage, more likely to be sexually experienced and promiscuous, and less competent (Cahoon & Edmonds, 1987; Edmonds & Cahoon, 1986; Gurung & Chrouser, 2007; Nezlek, Krohn, Wilson, & Maruskin, 2015), the majority of researchers have explored it from a social perspective of objectification theory (e.g., Daniels & Zurbriggen, 2016; Graff, Murnen, & Smolak, 2012; Gurung & Chrouser, 2007; Holland & Haslam, 2013; Nezlek et al., 2015; Tiggemann & Andrew, 2012) and attribution theories (e.g., McLeod, 2010). Some studies have examined individual difference variables associated with these biases (Gurung & Chrouser, 2007) and have found that women's own levels of social physique anxiety (i.e., anxiety in response to others' evaluations of one's physique) is associated with having stronger biases. These biases may have likely been selected for because they were adaptive for people with particular mating orientations or mating strategies. The biases likely helped identify potential mating threats or potential rivals. Additionally, research has also

indicated that women experience greater intrasexual competition at higher (versus lower) fertile periods of the menstrual cycle (Eisenbruch & Roney, 2016), and that women's perceptions of potential female rivals change as a function of hormonal status (Fisher, 2004). Women also have negative perceptions of revealingly dressed women (Vaillancourt & Sharma, 2011). However, no previous published studies examined whether hormones or fertility status influence women's perceptions of revealingly dressed women. Past studies have also not explored reasons why women have certain perceptions of other women (potential rivals) (e.g., it could be a byproduct of male mate preferences; due to jealousy; or it could be an evolved sociosexual mating strategy). Thus, this dissertation seems to have addressed gaps in the existing research by examining: (a) revealing dress biases from an evolutionary perspective in order to examine additional biases and to determine whether women with particular mating strategies are more or less likely to endorse particular perceptions of revealing dress; and (b) how women's fertility and sociosexuality influence their perceptions of other women (i.e., potential rivals) and other women's self-presentation style (low versus high revealing dress) in a mating context.

Summary of Results and Integration with Theories

Study 1 (N = 341) found evidence that women perceive high revealingly dressed women as more promiscuous, flirtatious, feminine, and attractive; but less intelligent, nice, and trustworthy than less revealingly dressed women. Women also expressed less interest in friendship with highly revealingly dressed women, experienced more of a jealousy response towards them, rated themselves as relatively less attractive, and felt that their partners would be more attracted to high (versus low) revealingly dressed women. Individual factors also related to how revealingly dressed women are perceived. For example, compared to single women, partnered women had more of a jealous emotional response towards highly revealing dressed

versus less revealing dressed women, viewed high revealingly dressed women as more promiscuous, and were less trusting of them than less revealingly dressed women.

It was also found that in comparison to 'non-virgin' or sexually experienced women, virgin women reported less interest in wanting to be friends with high revealingly dressed women relative to less revealingly dressed women, and rated high revealingly dressed women as relatively less attractive. Virgin women also reported more negative perceptions of women dressed in a high versus low revealing manner, in comparison to non-virgin women.

Compared to free-cyclers (women not using hormonal contraceptives: HCs), women using HCs rated high revealingly dressed women as less trustworthy, nice, and intelligent; and expressed less interest in being friends with them than less revealing dressing women in comparison to free-cyclers. HC users indicated that they believe that they have higher relative attractiveness to high revealingly dressed women versus less revealingly dressed women in comparison to free-cyclers, and HC users also rated high revealingly dressed women as being flirtier than less revealingly dressed women in comparison to free-cyclers.

Finally, compared to women low in STMO, women with a higher STMO viewed high revealingly dressed women as relatively more attractive, trustworthy, nice, and intelligent; and they expressed greater interest in friendship with them relative to women dressed less revealingly. That is, unrestricted women held more of the attractiveness revealing dress biases and less of the untrustworthiness, non-nice, unintelligent, non-friend, and negative biases about high revealingly dressed women. Additionally, compared to women lower on STMO, women higher on STMO viewed high revealingly dressed women as less promiscuous and flirtatious than less revealingly dressed women.

Similarly, Study 2 (n = 49) found further evidence of biases or perceptions of revealingly dress women within the context of women's mating strategies (e.g., sociosexuality) and individual factors (e.g., the menstrual cycle). Specifically, women low on STMO showed a trend to rate potential rivals as more attractive than women high on STMO. There was also a significant interaction for women low on STMO to experience more jealousy during high (versus low) fertility cycle days, while women high on STMO experienced less jealousy at high (versus low) fertility cycle days. Finally, increases in fertility across the menstrual cycle (from low to high) were associated with: (1) perceiving high compared to low revealingly dressed women more negatively; and (2) experiencing more jealousy towards all potential rivals (regardless of clothing style). Taken together, the findings from Studies 1 and 2 suggest that mating-relevant individual factors (e.g., relationship status, virginity status, HC use, mating orientation, and changes in fertility status) are associated with women's evaluations of, and feelings of jealousy towards, revealing dressed potential rivals.

A unique implication from the current dissertation involves the finding that women perceive revealingly dressed women more negatively than less revealingly dressed women (Study 1) and that this is more pronounced during times of higher fertility (Study 2). In addition to this, women felt that their partner would be more attracted to more (versus less) revealingly dressed women. This likely suggests that more revealingly dressed women are perceived as potential rivals to a greater extent than less revealingly dressed women. An evolutionary theory guiding this suggestion proposes that the reason women perceive revealingly dressed women more negatively is that they are more likely to perceive these women as potential mate rivals that their partner would be more attracted to in comparison to less revealingly dressed women (i.e., potential mate rivals). We are naming this possibility the Revealing Dress Rival (RDR)

Hypothesis. The hypothesis is that women perceive revealingly dressed women more negatively because they view the women as potential mate rivals. One way to define a mating rival is someone that women perceive that their current or future romantic partners would be attracted to. The present findings support this hypothesis as women report a bias towards perceiving the more revealingly dressed women as someone that their partners would be more attracted to (Study 1). Consistent with this hypothesis, there were biases towards viewing revealingly dressed women as more promiscuous, flirtatious, feminine, and attractive (characteristics valued by men in ST relationships); someone that is less trustworthy (a characteristic valued in LT relationships); someone they feel more jealous of; and someone that one views as relatively more attractive than oneself (compared to less revealingly dressed women). These biases are consistent with the RDR hypothesis as all of these characteristics are likely to characterize a mate rival. This hypothesis may seem like common sense and not particularly surprising. However, we are not aware of any published studies on revealing dress biases that have proposed this hypothesis and tested it. Thus, the present dissertation provides support for the RDR hypothesis and suggests that revealing dress biases may have evolved because revealing dressed women are viewed as mate rivals.

Holding biases about revealingly dressed women was an adaptive response (having success at intrasexual competition) that evolved within certain groups of people (low versus high STMO) and the adaptive value may be even stronger in particular contexts. That is, the negative biases toward revealing dress may have had adaptive values for women: (a) with particular mating strategies (low STMO, restrictedness); (b) in certain relationships contexts (partnered women, women who have not had sexual intercourse); and (c) in specific hormonal contexts (women taking HCs, high versus low fertility).

The following two findings are in line with the RDR hypothesis as well as the PSTS theory: (a) all women view revealingly dressed women more negatively at high (versus low) fertility days and (b) women low on STMO experience more jealousy during high (versus low) fertility cycle days, while women high on STMO experienced less jealousy at high (versus low) fertility cycle days (Study 2). PSTS theory posits that a periovulatory phase shift in sociosexual behaviour includes a shift towards more restricted sexual behaviour in unrestricted women and toward more unrestricted sexual behaviour in restricted women. The current findings suggest menstrual cyclicity in women's judgments of revealing dress and women's jealousy of potential rivals (biases consistent with the RDR hypothesis). In addition, the presence/absence of a short-term (ST) mating strategy affects the direction of menstrual cycle shifts in jealousy of potential rivals. Thus, the PSTS theory explains individual differences in women's RDR biases (based on one's level of STMO) and within-woman variations over time (e.g., across the menstrual).

Ovulation or high conception likelihood may cause some women to increase their intrasexual competition for mates, and the strategies used may differ for low and high STMO women given that both groups of women experience different directional shifts or changes in the type of mate they are looking for. Research indicates that near peak fertility, women are more likely to dress in ways that attract sexual attention from men (e.g., revealing more skin) (Durante, Li, & Haselton, 2008; Gueguen, 2009; Haselton, Mortezaie, Pillsworth, Bleske-Rechek, & Frederick, 2007). At higher fertility, women increase their own competitive edge through appearance-enhancing products (Durante, Griskevicius, Hill, Perilloux, & Li, 2011; Durante et al., 2008; Gueguen & Lubomir, 2012; Haselton et al., 2007; Saad & Stenstrom, 2012; Zhuang & Wang, 2014). It will be interesting for future researchers to examine whether these shifts differ as a function of STMO. One might hypothesize a PSTS for revealing dress given

that it seems to reflect a particular mating strategy, however, there may be a common peak in use of appearance-enhancing products at ovulation as all women should still want to maximize their general attractiveness. It seems practical or adaptive for women with a particular mating strategy (i.e., lower STMO) to derogate opposing rivals (e.g., revealingly dressed rivals) at higher fertility given the fact that women tend to increase their mating competitiveness by engaging in tactics aimed at increasing their attractiveness relative to a rivals in order to attract desirable partners when they are most likely to conceive. Thus, the RDR hypothesis suggests that women perceive revealingly dressed women more negatively because they view the women as potential mate rivals, while the PSTS theory suggests group differences in cyclical sensitivity to holding the biases about revealingly dressed potential rivals.

Strengths and Limitations

Specific limitations and strengths of the two individual studies have already been discussed within each study. However, several general limitations and strengths of Studies 1 and 2 warrant mention. Both Studies 1 and 2 included a relatively large sample size compared to past studies and used two evaluation methods (e.g., Likert-ratings and forced-choice ratings of revealing dress). Both studies were also the first to examine and find that revealing dress biases differ as a function of female observer mating orientation (e.g., STMO), mating-relevant traits, and fertility status. Finally, both studies used a large set of stimuli (i.e., 50 photos) to measure perceptions of revealing dress, and the stimuli set appears to be larger than that used in previous studies (e.g., Daniels & Zurbriggin, 2016; Graff et al., 2012; Gurung & Chrouser, 2007; Nezlek et al., 2015). The above-noted methodological enhancements provide additional validity to the evidence for the existence of biases towards revealing dress and changes in perceptions of revealing dress across the menstrual cycle.

Similar to much of the previous research on the perceptions of women's dress, the majority of participants were university students living in a North American urban city. Thus, generalizability is a consideration. Future research should examine if revealing dress biases and changes in perceptions across the menstrual cycle are similar in individuals who are in a different stage of their lives or living in a different culture.

Conclusion

Several conclusions stand out from the findings of this dissertation. First, the current project suggests that revealing dress biases may have evolved in response to men's mate preferences. For example, men's preferences for body revealing clothing in ST partners likely caused women to perceive revealingly dressed women as greater potential rivals than less revealingly dressed women. Support for the RDR hypothesis contributes to the existing literature by examining women's perceptions of revealing style of dress from an evolutionary perspective. Previous research has typically examined such perceptions from social perspectives (e.g., attribution theories, objectification theory). A second conclusion is that women's mating relevant individual-difference attributes (e.g., sexual orientation, sociosexuality, LT and ST mating orientation, body-esteem, relationship status, virginity status, hormonal contraceptive use, and conception likelihood) help to explain how women perceive other women, particularly when it comes to revealingly dressed women or potential rivals. Taken together, the dissertation enhances our understanding of how mating strategies and fertility in women may help to explain women's perceptions and biases about other women. This likely reflects and affects intrasexual competition and competitor derogation. The current findings may have important implications for understanding biases and misperceptions, and for helping to build and maximize healthy interpersonal relationships. The first step in overcoming biases and stereotypes is understanding

and recognizing that they exist and why they exist. Helping women recognize the reason for their automatic negative thoughts about other women (particularly revealingly dressed women) may help to train women to identify these thoughts and to be more cautious, aware, and mindful before acting upon them. It is hoped that understanding the evolutionary reasons for automatic negative thoughts about revealingly dressed women will help women to think critically about their thoughts and not engage in unwarranted bullying or mean behaviour towards other women. The RDR hypothesis or the evolutionary explanation may help to understand difficulties or conflict that can arise in interpersonal relationships within both friendships (e.g., who women befriend) and romantic (e.g., mate guarding behaviours based on the presence of potential rivals) contexts.

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Appendix A

Background Questionnaire

1. What is your current gender identity?
[ ] Male
[ ] Female
[ ] Trans male/Trans man
[ ] Trans female/Trans woman
[ ] Genderqueer/Gender non-conforming
[ ] Different identity (please state): _____

2. Please indicate your biological sex.
Male ___
Female ___
Other ___

3. Today's date: (day/month/year) ___/___/___

4. What time is it right now (at what time are you completing this questionnaire)? Please use the 12-hour clock (e.g., use 4:30 pm instead of 16:30)
Hour_____ Minute_____ am or pm (circle one)

5. What time did you wake up this morning? Please use the 12-hour clock (e.g., use 8:30 am instead of 08:30)
Hour_____ Minute_____ am or pm (circle one)

6. What time did you go to bed last night? Please use the 12-hour clock (e.g., use 10:30 pm instead of 22:30)
Hour_____ Minute_____ am or pm (circle one)

7. How many hours of sleep did you get last night? _____

8. Relative to your normal/typical sleep, how would you describe the quantity and quality of your sleep last night?

1	2	3	4	5	6	7
Very Poor			Average			Very Good

9. One hears about "morning" and "evening" types of people. Which **ONE** of these types do you consider yourself to be?

- Definitely a "morning" type
- Rather a more "morning" than an "evening" type
- Rather more an "evening" than a "morning" type

- Definitely an "evening" type

10. How old are you? _____

11. Please choose the response that best represents your ethnic background. If you need to select more than one response, then select “other” and please specify.

Caucasian/White	_____	Middle Eastern	_____
African-Canadian/Black	_____	East Indian	_____
Native-Canadian/First Nation	_____	European	_____
Hispanic/Latino	_____	Asian	_____

Other (please specify) _____

12. What is your **highest** level of education?

[ ] some elementary	[ ] some college	[ ] completed a university degree
[ ] completed grade 8	[ ] completed college certificate	
[ ] some high school	[ ] completed college diploma	[ ] some graduate studies
[ ] completed high school	[ ] some university	[ ] completed a graduate degree

13. What is your height? Please use either feet & inches (e.g., 5’ 5) or centimeters (e.g., 167).
_____ (feet & inches) or _____ (cm)

14. What is your weight? Please choose either Pounds (lbs) or Kilograms (kgs).
_____ (pounds) or _____ (kgs)

15. Are you currently taking any medications? (please circle) **NO** **YES**
If YES, how many medications are you taking? _____
IF YES, please check which ones you are taking.

[ ] Anti-depressants (e.g., Paxil, Zyban)	[ ] Asthma medication (e.g., inhalers)	[ ] Antibiotics
[ ] Thyroid medication (e.g., Methimazole)	[ ] Pain medication (i.e., Tylenol, Aspirin, Ibuprofen)	[ ] Anti-psychotics (e.g., Abilify, Clozaril)
[ ] Allergy medication	[ ] Hormone replacement therapy for menopause	[ ] Anti-anxiety medication (e.g., Celexa, Ativan, Inderal)

[ ] Other (please list) _____

16. Do you have any children? **NO** **YES**
If YES, how many children do you have? _____

17. Please rate yourself on the following scale of sexual orientation:

1	2	3	4	5	6	7	8	9
I am only attracted to people of the SAME SEX as me				I am equally attracted to to people of BOTH SEXES				I am only attracted to people of the OPPOSITE SEX as me

18. Please rate yourself on the following rating scale:

1 Exclusively heterosexual
2 Predominantly heterosexual, only incidentally homosexual
3 Predominantly heterosexual, but more than incidentally homosexual
4 Equally heterosexual and homosexual
5 Predominantly homosexual, but more than incidentally heterosexual
6 Predominantly homosexual, only incidentally heterosexual
7 Exclusively homosexual

19. Please indicate your degree of **sexual attraction** to women.

1	2	3	4	5	6	7	8	9
Not at all attracted to women								Extremely attracted to women

20. Please indicate your degree of **sexual attraction** to men.

1	2	3	4	5	6	7	8	9
Not at all attracted to men								Extremely attracted to men

21. Some people describe themselves as “asexual”. This means that one does not feel any sort of sexual attraction or sexual desire towards any men or any women. Do you think this describes you?

[ ] Yes [ ] No [ ] Maybe

22. Have you ever been in a committed relationship? **YES** **NO**

If you have been in a committed romantic relationship, have you ever been cheated on (please use your own definition of "cheating")?

NO **MAYBE** **YES**

If you have been in a committed romantic relationship, have you ever cheated on your partner (please use your own definition of "cheated")?

NO **MAYBE** **YES**

23. Check the box that best describes your current relationship status:

[ ] single (no partner) [ ] married or living with partner
[ ] casually dating [ ] one partner but living apart
[ ] more than one partner [ ] other (please specify): _____

If you are in a current relationship, how long have you been together? _____ years and _____ months

24. If you currently have a partner, please rate how attractive they are **in comparison to you.**

1	2	3	4	5	6	7	8	9	10
I am much more attractive than my partner									My partner is much more attractive

25. How many romantic relationships have you been in that have lasted more than 3 months?

_____

26. What is the longest romantic relationship you have been in? _____ years____ months

27. Have you ever been divorced or been in a co-habitating relationship that one or both of you ended (i.e., were you ever living with a partner, but then broke up)? **NO** **YES**

28. Please rate how good-looking **you** perceive **yourself** to be:

1	2	3	4	5	6	7	8	9	10
Not at all Good looking									Extremely Good-looking

29. Please rate how attractive you think you are when **compared to the general population**:

1	2	3	4	5	6	7	8	9	10
Significantly less attractive									Significantly more attractive

30. Have you ever been negatively or adversely affected by someone else's infidelity (e.g., a friend, current or former partner, parent, family member etc. who has been cheated on or have cheated on their partner)? **NO** **MAYBE** **YES**

31. This morning (**TODAY**) when you got ready for the day, to what extent did you considered trying to look like each of the following characteristics when you chose your clothes, accessories, styled your hair, applied personal care products, or applied make up (if applicable)? Please rate the extent to which you thought about trying to look like each of the following **today**:

	1 Not at all	**2**	**3**	**4 Somewhat**	**5**	**6**	**7 A lot**
Professional/Serious	1	2	3	4	5	6	7
Sexy	1	2	3	4	5	6	7
Casual/Relaxed	1	2	3	4	5	6	7
Natural/Minimalist	1	2	3	4	5	6	7
Understated/Unshowy	1	2	3	4	5	6	7
Modest/Proper	1	2	3	4	5	6	7

Mature	1	2	3	4	5	6	7
Sporty/Athletic	1	2	3	4	5	6	7
Pretty/Handsome	1	2	3	4	5	6	7
Cute	1	2	3	4	5	6	7
Feminine	1	2	3	4	5	6	7
Masculine	1	2	3	4	5	6	7
Clean and Fresh	1	2	3	4	5	6	7
Fun-Loving	1	2	3	4	5	6	7
Young/Youthful	1	2	3	4	5	6	7
Neat/Tidy	1	2	3	4	5	6	7
Carefree	1	2	3	4	5	6	7
Sophisticated	1	2	3	4	5	6	7
Approachable	1	2	3	4	5	6	7

32. Above you indicated the characteristics you considered when choosing your clothes for today. Below, please indicate the characteristics you would consider if you were to attend a social event tonight. Please indicate the extent to which you would consider each of the following characteristics when you chose your clothes, accessories, hairstyle, applied personal care products, or applied make up (if applicable)? Please rate the extent to which you would think about trying to look like each of the following for a **dinner at a fancy restaurant**:

	1 Not at all	**2**	**3**	**4 Somewhat**	**5**	**6**	**7 A lot**
Professional/Serious	1	2	3	4	5	6	7
Sexy	1	2	3	4	5	6	7
Casual/Relaxed	1	2	3	4	5	6	7
Natural/Minimalist	1	2	3	4	5	6	7
Understated/Unshowy	1	2	3	4	5	6	7
Modest/Proper	1	2	3	4	5	6	7
Mature	1	2	3	4	5	6	7
Sporty/Athletic	1	2	3	4	5	6	7
Pretty/Handsome	1	2	3	4	5	6	7
Cute	1	2	3	4	5	6	7
Feminine	1	2	3	4	5	6	7
Masculine	1	2	3	4	5	6	7
Clean and Fresh	1	2	3	4	5	6	7
Fun-Loving	1	2	3	4	5	6	7
Young/Youthful	1	2	3	4	5	6	7
Neat/Tidy	1	2	3	4	5	6	7
Carefree	1	2	3	4	5	6	7
Sophisticated	1	2	3	4	5	6	7
Approachable	1	2	3	4	5	6	7

33. Please indicate the extent to which you generally think about or consider how people of the **opposite sex** will perceive you when you choose your clothing, accessories, hairstyle, personal care products, or make up (if applicable) on a typical day:

1	2	3	4	5	6	7	8	9	10
Not at all									Extremely

34. Please indicate the extent to which you generally think about or consider what other people of the **same sex** will perceive you when you choose your clothing, accessories, hairstyle, personal care products, or make up (if applicable) on a typical day:

1	2	3	4	5	6	7	8	9	10
Not at all									Extremely

35. Which description best describes your interactions with people of the opposite sex (if you are not exclusively heterosexual, please think about the group of potential mates that is relevant to you). Please consider times when you are not in a committed relationship and pick the response that best applies to you:

- I "go after"/approach most/all members of the opposite sex, regardless of physical attractiveness
- I "go after"/approach members of the opposite sex who are below average in terms of physical attractiveness
- I "go after"/approach members of the opposite sex who are at least at an average level of physical attractiveness
- I "go after"/approach members of the opposite sex who are at least above average in terms of physical attractiveness
- I only "go after"/approach the most physically attractive members of the opposite sex (i.e., top ten percent of them)
- I rarely "go after"/approach any members of the opposite sex

36. Which description best describes your interactions with people of the opposite sex (if you are not exclusively heterosexual, please think about the group of potential mates that is relevant to you). Please consider times when you are not in a committed relationship.

- I am open to offers from most/all members of the opposite sex, regardless of physical attractiveness
- I am open to offers from the opposite sex who are below average in terms of physical attractiveness
- I am only open to offers from members of the opposite sex who are at least at an average level of physical attractiveness
- I am only open to offers from members of the opposite sex who are at least above average in terms of physical attractiveness

- I am only open to offers from only the most physically attractive members of the opposite sex (i.e., top ten percent of them)
- I am open to very few or no offers from the opposite sex

Appendix B

Sexual History Questionnaire

1. Have you ever had sexual intercourse? **YES NO**
   If **NO**, please go to item 4.

2. At what age did you first have consensual sexual intercourse (i.e., both partners were willing)?
_____

3. Think about the first person you had sexual intercourse with. How long did you and your sexual partner date or know each other for before having sexual intercourse? Please use only the units of time needed to best answer these questions.

   We dated for _____ before having sex
   We knew each other for _____ before having sex

4. How many men have you performed oral sex on (your mouth on his genitals)?
   _____

5. How many men have performed oral sex on you (his mouth on your genitals)?
   _____

6. How many women have you performed oral sex on (your mouth on her genitals)?
   _____

7. How many women have performed oral sex on you (her mouth on your genitals)?
   _____

8. How many men and women have you had sexual contact with that involved touching their genitals (i.e., your hand on their naked genitals)?
   _____

9. Have you ever deep/tongue/French kissed another person when you were in a steady relationship with someone else (please circle)?
   NO YES

10. Have you ever engaged in oral sex (performed or received) with someone when you were in a steady relationship with someone else?
   NO YES

11. Have you ever had sex with someone when you were in a steady relationship with someone else?
   NO YES

12. How often do you masturbate (please circle the most appropriate response)?

1. Never
2. Once every two or three months
3. Once a month
4. Once every two weeks
5. Once a week
6. A few times each week
7. Nearly every day
8. At least once a day

13. What percentage of the time do you reach orgasm when you masturbate?

0%		25%		50%		75%		100%
0	1	2	3	4	5	6	7	8

14. How difficult/easy is it for you to reach orgasm when you masturbate?

Extremely Difficult							Extremely Easy
1	2	3	4	5	6	7	8

15. What percentage of the time do you reach orgasm when you have sexual relations with a partner?

0%		25%		50%		75%		100%
0	1	2	3	4	5	6	7	8

16. How difficult/easy is it for you to reach orgasm with a partner?

Extremely Difficult							Extremely Easy
1	2	3	4	5	6	7	8

17. How often do you fake orgasms with a partner?

Never							Always
0	1	2	3	4	5	6	7	8

18. In your lifetime, with how many different people have you had skin-to-skin penis-vagina contact that may or may not have involved sexual intercourse? _____

19. Have you had sexual intercourse in the last 48 hours? **NO** **YES**
If **YES**, how many times?_____

Appendix C

Perception of Women Questionnaire

FORCED CHOICE QUESTIONS: The following four forced-choice questions were asked for 25-pairs of photos. Below is an example for 1 of the 25 pairs of photographs.

You are going to be shown two photographs of women. You will be asked to choose **one woman** that you find more attractive, **one woman** that you would be more interested in being friends with, **one woman** you would be more jealous of, and **one woman** you view more negatively. You will be asked to indicate how strongly you feel about your choices using a scale.

1. Which woman do you find more attractive? Please indicate the extent to which you find her more attractive by choosing the best/most accurate response under her photograph.

0	1	2	3	4	5	6	7
Much more attractive	More attractive	Somewhat more attractive	Slightly more attractive	Slightly more attractive	Somewhat more attractive	More attractive	Much more attractive

2. Which woman would you be more interested in being friends with? Please indicate the extent to which you would be more interested in being friends with that woman by choosing the best/most accurate response under her photograph.

0	1	2	3	4	5	6	7
Much more interested	More interested	Somewhat more interested	Slightly more interested	Slightly more interested	Somewhat more interested	More interested	Much more interested

3. Which woman would you be more jealous of if the woman was talking to your partner (current or future partner)? Please indicate the extent to which you would be more jealous of that woman by choosing the best/most accurate response under her photograph.

0	1	2	3	4	5	6	7
Much more jealous	More jealous	Somewhat more jealous	Slightly more jealous	Slightly more jealous	Somewhat more jealous	More jealous	Much more jealous

4. Overall, which woman do you view more negatively? Please indicate the extent to which you view that woman more negatively by choosing the best/most accurate response under her photograph.

0	1	2	3	4	5	6	7
Much more negatively	More negatively	Somewhat more negatively	Slightly more negatively	Slightly more negatively	Somewhat more negatively	More negatively	Much more negatively

LIKERT-TYPE RATINGS: The following 11 likert-type rating scale questions were asked for 50 photos. Below is an example for 1 of the 50 photographs.

Please answer the following questions based on what you think about the woman presented in the photo:

	1 **Not at all**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10** **Extremely**
5. How attractive do you think she is?	1	2	3	4	5	6	7	8	9	10
6. How trustworthy do you think she is?	1	2	3	4	5	6	7	8	9	10
7. How feminine do you think she is?	1	2	3	4	5	6	7	8	9	10
8. How promiscuous do you think she is?	1	2	3	4	5	6	7	8	9	10
9. How nice/caring do you think she is?	1	2	3	4	5	6	7	8	9	10
10. How intelligent do you think she is?	1	2	3	4	5	6	7	8	9	10
11. How good of a friend do you think she is?	1	2	3	4	5	6	7	8	9	10
12. How jealous would you feel if she was talking to your partner (current or future)?	1	2	3	4	5	6	7	8	9	10
13. How flirty do you think she would act towards your partner (current or future)?	1	2	3	4	5	6	7	8	9	10
14. How attracted do you think your partner (current or future) would be to her?	1	2	3	4	5	6	7	8	9	10

15. How attractive do you think the woman is in comparison to you right now?

1	2	3	4	5	6	7	8	9
She is much more attractive				We are both equally attractive				I am much more attractive

Appendix D

Online Letter to Participants and Consent Form

Perceptions of Women Study

Dear Potential Participant,

You are invited to participate in a research project examining the factors that affect men's and women's perceptions of women, both as potential sexual partners and friends. Factors that will be examined include factors related to the rater (e.g., sex, time, physical characteristics, hormones) and factors related to the women being rated (e.g., clothing style). This study is being conducted by Katelyn Duchene and Dr. Kirsten Oinonen from the Health Hormones and Behaviour Laboratory (HHAB LAB) in the department of Psychology at Lakehead University. Some of the data will be used in Katelyn Duchene's Ph.D. dissertation on this topic, and the data will also be used to examine other exploratory research questions in the areas of health, mating, and development in the HHAB LAB. The study consists of two sessions to be completed one (for men) or two (for women) weeks apart. The first session will take 45 to 60 minutes to complete, while the second session will take 30 to 45 minutes to complete. Both questionnaires can be completed in the laboratory or online. Both sessions involve answering personal questions about your sexual behaviour, relationship history, and perceptions of your own behaviour and personality. You will also be asked to rate photos of women in various styles of dress, ranging from scantily- to less revealingly-clad, in terms of attractiveness and various personality characteristics. There are no obvious risks involved in participating in this study other than the fact that some participants may feel uncomfortable answering some personal questions or looking at pictures of women, or have new positive or negative thoughts about oneself after answering the questions (i.e., new personal insight). Please note that you are not required to answer all questions and can skip any question or part of the study that makes you uncomfortable. This study is open to all individuals who are 16 years of age or older.

Lakehead University Psychology students who are registered in an eligible course will receive up to two bonus points for participating in the study online, one bonus point per session (lab sessions provide 1.5 points per session for a maximum of 3 points). Your participation in this study is completely voluntary and you have the right to withdraw at any time without penalty or explanation prior to completing and submitting the online questionnaire. All records of your participation will be kept confidential and reports of the study will not reveal your identity. However, your email address is requested at the first session so you can be contacted to participate in the second session. Your email address will be used for contacting you about the second session and will not be given out to any third parties. In addition, your email address will be used to connect your responses from session I to your responses from session II, and will be replaced with a random participant code at the end of the study. At all times, anonymity and confidentiality will be a priority. Only Katelyn Duchene will have access to your information during the study when email addresses are connected to responses. However, when looking at your email address in order to contact you for session 2, she will never look at any of your responses. Your email address will be removed from all of your responses at the end of the study. At that time, no one, including the researchers, will be able to connect any information gathered to a specific individual (i.e., all information will be anonymous). There is no obligation

to provide an email address or any other identifying information, however such information is requested from students at Lakehead University in eligible Psychology courses so that their bonus points can be provided. Identifying information will be removed once bonus points have been recorded.

The potential benefits of this project include increasing scientific knowledge of the factors influencing the perceptions of women, as well as greater knowledge of the factors affecting mating behaviours in general, which may provide knowledge that helps individual's find partners and maintain healthy relationships. Furthermore, the possible benefits of participation in this study include learning about research processes, the receipt of bonus points towards Psychology course marks, and the knowledge of contributing to research that will enhance the understanding of factors affecting the perceptions of women.

University regulations state that all data must be stored for a minimum of five years; data will be kept in a secure location by Dr. Oinonen and will remain confidential and anonymous. If you have any questions or concerns regarding the study please contact Katelyn Duchene or Dr. Oinonen. This study has been approved by the Lakehead University Ethics Board (807-343-8283) and they can also be contacted about any concerns.

Upon completion of the study, interested participants are welcome to contact one of the researchers to request a summary of the results. Thank you very much for your time. We very much appreciate your contribution to our research.

Katelyn Duchene, M.A.
Ph.D. Student
Lakehead University
955 Oliver Road
Thunder Bay, Ontario P7B 5E1
email: StudyPerception@gmail.com

Dr. Kirsten Oinonen Ph.D., C. Psych.
Associate Professor
Department of Psychology
Lakehead University
955 Oliver Road
Thunder Bay, Ontario P7B 5E1
email: koinonen@lakeheadu.ca
(807) 343-8096

Consent:

I have read and understood the above information and I agree to participate in this study under these conditions. I also understand that I am not obliged to answer questions which I am uncomfortable with and that I am free to withdraw from the study at any time without penalty or other consequence prior to completing the online questionnaire.

[ ] I understand that my consent to the above is implied if I check this box and choose to continue with this study.

Appendix E

Debriefing Form

Thank-you for participating in this study on the factors affecting men's and women's perceptions of women, both as potential sexual partners and friends. Portions of the data you provided will be used to complete a Ph.D. dissertation by Katelyn Duchene under the supervision of Dr. Kirsten Oinonen. You will be asked to complete the second session of the study in two weeks in order to complete the research study. For men, if you just completed the session in the morning, you will be asked to complete the second session in the evening, and if you completed the session in the afternoon or evening, you will be ask to complete the second session in the morning. For women, you will be asked to complete the second session at roughly the same time you just completed the first session. You will be contacted via the email address you have provided with details on how to complete the second session.

This research project was approved by the Lakehead University Research Ethics Board (807-343-8283). If you are a Lakehead University Psychology student who is enrolled in an eligible course, please be advised that your professor will be notified near the end of the semester regarding your bonus credit for participation in the study (if you have provided all the relevant information).

Please be assured that all data will remain anonymous and confidential. If you would like to receive a summary of the results of the study, please email one of the researchers and, upon completion of the study, a summary of the results will be emailed to you. Please note that providing your email address does not jeopardize your anonymity.

Thank you very much for your time. We very much appreciate your contribution to our research.

Katelyn Duchene, M.A.
Ph.D. Student
Lakehead University
955 Oliver Road
Thunder Bay, Ontario P7B 5E1
email: StudyPerception@gmail.com

Dr. Kirsten Oinonen Ph.D., C. Psych.
Associate Professor
Department of Psychology
Lakehead University
955 Oliver Road
Thunder Bay, Ontario P7B 5E1
email: koinonen@lakeheadu.ca
(807) 343-8096

Appendix F

Examination of Outliers, Skewness, and Kurtosis of Scales

Variable Name	Number of Outliers	Result[a]
Likert RD Difference Scores		
Promiscuous	2	No longer outliers
Flirtatious	2	No longer outliers
Partner's Attraction	2	No longer outliers
Relative Attractiveness	2	No longer outliers
Trustworthy	3	No longer outliers; scale slightly positively kurtosed and slightly negatively skewed
Nice	3	No longer outliers; scale slightly negatively skewed
Attractiveness	4	No longer outliers; scale slightly positively kurtosed
Intelligence	4	No longer outliers; scale slightly positively kurtosed and slightly negatively skewed
Friend	4	No longer outliers; scale slightly positively kurtosed and slightly negatively skewed
Femininity	5	No longer outliers; scale slightly negatively skewed
Forced-Choice RD Scores		
Jealousy Emotional Response	1	No longer outlier; scale slightly positively skewed
Other Variables		
Sociosexuality Inventory	5	All remained as outliers below a z-score of 3.6; scale slightly positively skewed and kurtosed
Long-Term Mating Orientation Scale	3	No longer outliers; scale moderately negatively skewed

Note. RD = revealing dress.

[a] This column indicates the result after outliers were changed to one unit above or below the last score that was not an outlier.

Appendix G

Hormonal Status Questionnaire

1. Are you currently pregnant? **NO** **MAYBE** **YES**

2. Are you currently lactating (i.e., breast-feeding)? **NO** **MAYBE** **YES**

3. Which statement below best describes you:
[ ] I have never taken oral contraceptives ("the pill")
[ ] I previously used the pill but I am no longer using it
[ ] I am currently taking oral contraceptives ("the pill")

4. If you previously took oral contraceptives/the pill, how long ago did you stop taking it? _____ **months** and _____ **years**

5. If you are currently taking any type of hormonal contraceptive (e.g., the pill, the patch, injections, IUD, the ring), select the type of hormonal contraceptive you are currently taking.

Oral Contraceptive:

Alesse	Altavera	Alyacen	Amethia	Amethia Lo	Amethyst	Apri	Aranelle
Aviane	Azurette	Balziva	Beyaz	Brevicon	Briellyn	Camila	Camrese
Camrese Lo	Caziant	Cesia	Cryselle	Cyclafem	Cyclessa	Dasetta	Daysee
Desogen	Elinest	Emoquette	Enpresse	Enskyce	Errin	Estarylla	Estrostep Fe
Falmina	Femcon Fe	Gianvi	Gildess Fe	Heather	Jencycla	Jolivette	Jolessa
Junel Fe	Junel	Junel Fe	Kariva	Kelnor	Kurvelo	Leena	Lessina
Levlite	Levonest	Levora	Lo/Ovral	Loestrin	Loestrin Fe	Lo Loestrin Fe	Lo Minastrin 24 Fe
Loryna	LoSeasonique	Low-Ogestrel	Lutera	Lybrel	Microgestin	Microgestin Fe	Minastrin 24 Fe
Mircette	Myzilra	Modicon	Mono-Linyah	MonoNessa	Natazia	Necon	Nora-BE
Nordette	Norinyl	Nor-QD	Nortrel	Ocella	Ogestrel	Ortho Micronor	Ortho Tri-Cyclen Lo
Ortho Tri-Cyclen	Ortho-Cept	Ortho-Cyclen	Ortho-Novum	Orsythia	Ovcon	Philith	Pirmella
Pimtrea	Portia	Previfem	Quasense	Quartette	Reclipsen	Safyral	Seasonale
Solia	Sprintec	Sronyx	Syeda	Tilia Fe	Tri-Linyah	Tri-Legest Fe	TriNessa
Tri-Norinyl	Triphasil	Tri-Estarylla	Tri-Previfem	Tri-Sprintec	Trivora	Velivet	Vestura
Viorele	Wera	Wymzya Fe	Yasmin	Yaz	Zarah	Zenchent	Zeosa

[ ] Other (please specify): _____

Injected Contraceptive:
[ ] Depo-Provera
[ ] Lunelle
[ ] Other (Please specify): _____

Contraceptive Patch:
[ ] Evra
[ ] Other (Please specify): _____

Intrauterine Device (IUD):
[ ] Mirena (hormonal)
[ ] Nova-T (non-hormonal; copper)
[ ] Flexi-T (non-hormonal; copper)
[ ] Other (Please specify): _____

Vaginal Ring:
[ ] NuvaRing
[ ] Other (Please specify): _____

6. If you are currently taking a hormonal contraceptive, how long have you been taking the above stated hormonal contraceptive? _____ **months** and _____ **years**

7. If you are taking a hormonal contraceptive, what phase of your hormonal contraceptives are you currently in?

___ Week 1 of active pills/patch/ring
___ Week 2 of active pills/patch/ring
___ Week 3 of active pills/patch/ring
___ I take or use my pills/Depo-Provera injection/patch/ring continuously so I get a period only every few months or not at all
___ Pill/patch/ring-free/Inactive/Sugar pill/ week (when most women have their period)
___ I don't know

8. What is the average length of your menstrual cycle right now (i.e., How many days are there from the first day of one period to the day before your next period. Most people range between 25 and 35 days)?
a)_____ **DAYS**
b) _____ I have gone through menopause and I do not have a period

9. How many days does your period/menses/bleeding usually last?
a) _____ **DAYS**
b) _____ I have gone through menopause and I do not have a period

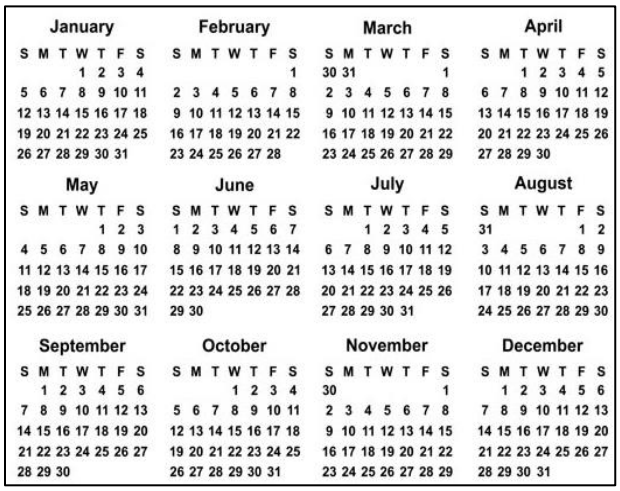
10. Which statement best describes your menstrual cycle **right now**?
[ ] I have gone through menopause and do not have a period
[ ] I am not currently menstruating because I am currently lactating/breast feeding
[ ] I never have my period.
[ ] Some months I get my period and some months I don't.
[ ] I usually get my period every month, but it is irregular and I cannot predict when it will start.
[ ] I usually get my period within two or three days of when I expect it.
[ ] My period is like clockwork and the same number of days elapse between periods each month.

11. Generally speaking, are your periods regular or irregular? That is, is the length of time between your periods about the same each cycle?

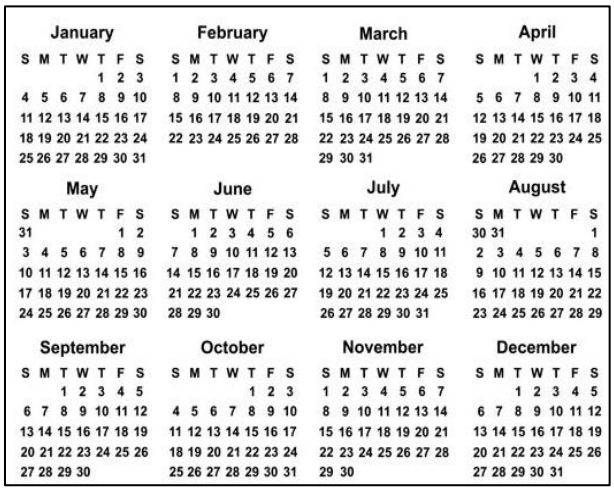
[ ] My periods are generally regular
[ ] My periods are generally irregular
[ ] I don't know

The next few questions pertain to your last and next period. Please refer to the following calendars.

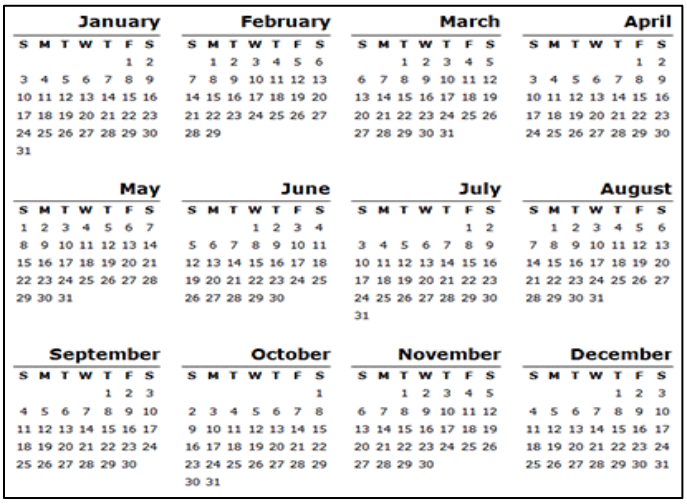
2014



2015



2016



12. When did your last period start? That is, when was your first day of bleeding (month/day)?

_____

13. How confident are you that the first day of your last period is accurate? (Circle the best response)

0%		25%		50%		75%		100%
0	1	2	3	4	5	6	7	8

14. When do you expect your next period to start. That is, when do you think will be the first day of bleeding? (month/day)? _____

15. How confident are you that your period will start on that day? (Circle the best response)

0%		25%		50%		75%		100%
0	1	2	3	4	5	6	7	8

16. Are you currently menstruating or having your period? **YES NO**
If **YES**, how many days have you been bleeding (e.g., 1 day if this is your first day of bleeding)?
_____ DAYS

17. What day of your menstrual cycle are you on today? (Day 1 of the menstrual cycle is on the first day of bleeding. If your period started on January 1st, and today is January 25th, you would be on day 25 of your menstrual cycle. Please refer to the calendar above.)
DAY _____

18. How old were you when you first started menstruating (i.e., when you first got your period)?
_____ years old

19. Do you think that you have started to go through menopause? **NO MAYBE YES**

Appendix H Research Ethics Board Approval

Research Ethics Board
t: (807) 343-8283
research@lakeheadu.ca

November 18, 2014

Principal Investigator: Dr. Kirsten Oinonen
Student Investigator: Katelyn Duchene
Psychology
Lakehead University
955 Oliver Road
Thunder Bay, ON P7B 5E1

Dear Dr. Kirsten Oinonen:

Re: REB Project #: 076 14-15 / Romeo File No: 1464173
Granting Agency: N/A
Granting Agency Project #: N/A

On behalf of the Research Ethics Board, I am pleased to grant ethical approval to your research project titled, "Perceptions of Women Study".

Ethics approval is valid until November 18th 2015. Please submit a Request for Renewal form to the Office of Research Services by October 18th, 2015 if your research involving human subjects will continue for longer than one year. A Final Report must be submitted promptly upon completion of the project. Research Ethics Board forms are available through the Romeo Research Portal at:

http://romeo.lakeheadu.ca/Romeo.Researcher/login.aspx

During the course of the study, any modifications to the protocol or forms must not be initiated without prior written approval from the REB. You must promptly notify the REB of any adverse events that may occur.

Best wishes for a successful research project.

Sincerely,

Dr. Lori Chambers
Chair, Research Ethics Board

/rks