

**CHANGES IN RELATIONSHIP QUALITY ACROSS THE FEMALE  
MENSTRUAL CYCLE: A DIARY STUDY OF DATING COUPLES**

A Thesis

by

JENNIE YING-CHEN CHEN

Submitted to the Office of Graduate Studies of  
Texas A&M University  
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

December 2005

Major Subject: Psychology

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## ABSTRACT

Changes in Relationship Quality across the Female Menstrual Cycle: A Diary Study of Dating Couples. (December 2005)

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Chair of Advisory Committee: Dr. W. Steve Rholes

Strategic pluralism in human mating behaviors has been explored in recent years. Women may engage in short-term and long-term mating relationships simultaneously to reap the benefits of both strategies. However, little research testing the extent to which the strategies are used within couples has been conducted. According to this model, women typically should engage in long-term mating strategies. However, during ovulation when the risk of conception is greatest, women may enact a short-term mating strategy, particularly if their primary relationship is not perceived to be high in quality or if their current partner is viewed as less attractive. The current study followed 45 couples for 30 consecutive days. Both partners in each couple were asked to complete daily diaries that involved ratings of daily relationship quality, jealousy, and ovulation cues. Additionally, saliva samples were collected from each woman to confirm her ovulation status. Using Hierarchical Linear Modeling (HLM), the data confirmed that women tended to be less interested in their primary relationship during ovulation, the effect being more pronounced if women reported less relationship satisfaction or were mated with less attractive partners. Men also reported that their partners were less focused on the relationship and that their partner's scent was more attractive during ovulation than at other times of the menstrual cycle. These provide some evidence that

women tend to focus less on their romantic relationships during ovulation, and that men tend to corroborate their partner's reports.

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## TABLE OF CONTENTS

	Page
ABSTRACT.....	iii
ACKNOWLEDGEMENTS.....	v
TABLE OF CONTENTS.....	vi
LIST OF TABLES.....	vii
I. INTRODUCTION .....	1
II. METHODS.....	10
Participants.....	10
Materials and Stimuli.....	10
Procedure.....	10
Estimation of Ovulation.....	12
Reordering Diary Days.....	12
Testing Models and Predictions.....	15
III. RESULTS.....	16
Descriptive Statistics.....	16
Test of Predictions.....	17
IV. DISCUSSION AND CONCLUSIONS.....	20
REFERENCES.....	26
APPENDIX A TABLES.....	30
APPENDIX B GENERAL SURVEY.....	32
APPENDIX C DIARIES.....	47
VITA.....	52

**LIST OF TABLES**

TABLE		Page
1	Diary Items: Descriptive Statistics and Paired T-tests.....	30
2	Diary Items: Quadratic Models.....	31

## I. INTRODUCTION

In preparation for pregnancy, women go through hormonal changes. The well-orchestrated cycle of changes is referred to as the menstrual cycle, which is regulated by an intricate set of relations between the hypothalamus and various endocrine glands. The hormones that are involved in this process include lutenizing hormone, estrogen, progesterone, and follicular stimulating hormone. The menstrual cycle, therefore, is not an independent system that involves only the uterus and ovaries. Until recently, it was not widely known that the menstrual cycle has effects on the brain, emotions, and behavior.

On average, the menstrual cycle takes 28 days. During the first portion of the cycle, the uterus is preparing for ovulation. The egg follicle grows and matures until the 14<sup>th</sup> day of the cycle or approximately two weeks prior to menstruation. Estrogen peaks just prior to ovulation, and lutenizing hormone and follicle stimulating hormone then peak at ovulation. During ovulation, the egg is released from the ovary and travels through the fallopian tube to the uterus. It is only during this time that conception can occur. Thus, this is the period during the menstrual cycle when copulation can result in pregnancy. This window of time is referred to as the window of conception, the window of fertility, or the phase of highest risk of conception.

According to some theorists, different mating strategies may be enacted at different points of the menstrual cycle (Gangestad & Simpson, 2000). Specifically, it has been proposed that there are two general types of men that most women prefer as mates: (1) mates that might be “good parents,” and (2) mates that might have “good



genes” that might be passed on to offspring (Gangestad, 1993). The term “good parent” is used to describe men who are both able and willing to be good providers and, thus, more likely to invest time, resources, and effort in parenting. The term “good genes” is used to describe men who have the attributes or cues signaling good genes (i.e., symmetrical features, highly masculine appearance), but are also more likely to be aggressive, sexualize other women, and invest less in relationships and offspring.

In order to obtain the benefits of both types of men, women may engage in strategic pluralistic mating. That is, they may selectively engage in both short-term mating and long-term mating, depending on current conditions. Thus, while in a primary relationship with a “good parent” mate, a woman might for example engage in a selective extra-pair relationship with a man who possesses indicators of “good genes”. Such an extra-pair relationship is usually characterized as being short-term in duration and primarily sexual in nature.

Sustaining multiple sexual relationships, however, may often not be feasible. Not only is it time consuming to have multiple mates; extra-pair involvements also reduce the amount time that a woman can invest with a “good parent” mate. Moreover, extra-pair relationships carry risks and consequences if extra-pair relationships that are secretive are exposed. Nevertheless, by selectively engaging in extra-pair mating with a mate who may have “good genes”, a woman can potentially receive the benefits of both mates. According to Strategic Pluralism, therefore, the benefit for a woman to mate with a “good genes” man is to obtain the superior genes for her children. Because the window of time in which a woman can become pregnant is small each month, a

woman's preference for a "good genes" male should be evident only during the ovulatory phase of her menstrual cycle.

For many years, behavioral changes related to the menstrual cycle were presumed to occur only around the time of menstruation. These changes were usually associated with negative behaviors such as moodiness, irritability, fatigue, anxiety, change in appetite, depression, and headaches. Recently, however, researchers have identified behavioral changes in women across the entire menstrual cycle.

Stanislaw and Rice (1998), for instance, found that sexual desire fluctuates during the menstrual cycle. Married women rated their sexual desire on a daily basis for two years. Ovulation was assessed through body temperature measurements throughout the study. Stanislaw and Rice found that women reported greater sexual desire during ovulation than when not ovulating.

Grammer (1996) found that women tend to wear more revealing clothing during ovulation. Studying women who were attending a dance club, the researchers took photographs of women and observed their behavior in the bar. Women who were ovulating wore more revealing clothing and tighter skirts. They also touched men more than did women who were not ovulating.

In addition, Baker and Bellis (1995) found that women are more likely to engage in extra-pair copulations (EPCs) during ovulation. This phenomenon does not imply that all women tend to engage in extra-pair copulations during ovulation. However, it does imply that if women engage in EPCs, they should be more likely to do so during ovulation than at other times of the menstrual cycle. Because of the negative

consequences that may accompany extra-pair copulations, there may be a functional reason why women engage in EPCs during high risk-of- pregnancy periods.

These results confirm that women tend to behave differently during ovulation. In general, women tend to have greater sexual desire and engage in more sexual signaling when ovulating. These findings support the premise that women might unconsciously engage in behavior that may facilitate certain mating opportunities. However, given that women tend to engage in extra-pair copulations when the risk of pregnancy is greatest, there must be some benefits for engaging in such potentially costly behaviors. The negative consequences of extra-pair copulations may result in the loss of resources, tarnished reputations, physical retaliation by aggrieved romantic partners, and/or loss of social support from friends and family (Buss and Schmitt, 1993).

Not only do women's behaviors change across the menstrual cycle, but their mating preferences do as well. Women are more likely to find masculine men more attractive during ovulation (Johnston et al, 2001; Penton-Voak et al, 1999). Johnston (2001), for example, utilized a technique that involves masculinizing or feminizing photographs of faces. Participants were shown computer composite facial images that metamorphized from being highly masculine to highly feminine (i.e. they saw faces that changed from being extremely masculine to extremely feminine). Using this technique, the attractiveness and symmetry of each face remained the same, thus controlling for most other facial attractiveness factors. Women indicated which faces were more attractive, both when they were ovulating and when they were not ovulating. The results revealed that women preferred more masculine men, but only during.

Moreover, Penton-Voak et al. (1999) asked women to rate men's attractiveness as both short-term and long-term partners. They found that ovulation had a significant effect on the types of men that women found most attractive. Ovulating women preferred masculine men as short-term partners, but ovulation had no effect on preferences for long-term partners.

Gangestad and Thornhill (1998) found that women's preferences for the scent of men also shifts across ovulation. Fluctuating asymmetry measures were made on male participants. Fluctuating asymmetry has been theorized to be an indicator of allostatic load (Thornhill and Gangestad, 1993). Theoretically, lower levels of allostatic load or stresses (i.e., due to illness, disease, etc) during development should be associated with the development of more symmetrical features (Thornhill and Gangestad, 1993). Higher allostatic load or other problems during development should lead to less symmetrical development of the body, resulting in a less physically attractive individual. Males were asked to wear tee shirts overnight for two days. Ovulating women then smelled the shirts. They reported that the tee shirts of more symmetrical men were preferable in scent compared to the tee shirts worn by less symmetrical men. These results suggest that, during ovulation, women maybe more attuned to indicators of symmetry in men.

Garver-Apgar, Gangestad, and Simpson (2003) also assessed women's judgments of men during ovulation. Viewing videotapes of men being interviewed for a potential lunch date, women viewed and rated each man's potential to engage in sexually coercive tactics. As expected, ovulating women perceived greater coerciveness in the men, the explanation being that women should be more sensitive to such dangers during

times of heightened conception risk.

Past research has also shown that women are attracted to more masculine men during ovulation. Masculine men have more angular jaws, and heavier brow protrusion (Grammer and Thornhill, 1994). However, masculine men also tend to be less investing in relationships, less faithful as relationship partners, and more aggressive (Thornhill and Gangestad, 1999). Such men are not typically preferred as long-term relationship partners due to these negative traits and behaviors. However, women tend to prefer more masculine men during ovulation, particularly as short-term mates (Penton-Voak et al., 1999). These findings also support the notion that women may prefer different types of men at different points of the menstrual cycle, and that different men may serve different reproductive functions for women (Gangestad and Simpson, 2000).

Research has also examined men's preference for women across the menstrual cycle. Singh and Bronstad (2001), for example, conducted a study that tested men's preferences for ovulating women's pheromones. Women wore tee shirts at different points of their menstrual cycles. Men then smelled and rated their preference for each of the shirts. As predicted, men preferred the tee shirts worn by women when they were ovulating. This suggests that even although men might not be consciously aware of when women are ovulating, they tend to prefer a woman's scent more when she is more likely to reproduce.

Recently, research has also examined established romantic couples. Haselton and Gangestad (2003), for instance, conducted a diary study in which they asked women to keep diaries about their attraction to men other than their primary partners. The

results indicated that women in established relationships reported being more attracted to men who were not their primary partners, but mainly during ovulation. However, these results were moderated by their primary partner's degree of symmetry. In particular, women that were dating more with a symmetrical primary partners remained more attracted to them during ovulation. Women whose primary partners were less symmetrical, on the other hand, were less attracted to them during ovulation and more attracted to other men. These findings suggest that women's preference for symmetrical partners is heightened during ovulation.

In summary, past research has confirmed that women tend to display greater sexual desire during ovulation than at other times of the reproductive cycle. They also behave in ways to attract certain types of partners by engaging in sexual signaling, wearing more revealing clothing, and touching men more often. Women also tend to be attracted to different types of men when they are ovulating. Ovulating women, for example, typically prefer more masculine and more symmetrical men more so than do non-ovulating women.

More masculine and more symmetrical men, however, tend to exhibit behaviors that are detrimental to long-term relationships in that they tend to be less faithful, engage in negative mate guarding tactics, are more aggressive, and spend less time and resources on relationship partner's mates (Penton-Voak et al., 1999). Because these characteristics are not desirable in long-term relationship partners, women should find these men less appealing as long-term relationship partners.

Given that women should prefer different types of men at different times of the

menstrual cycle, women should employ a combination of long-term and short-term mating strategies to obtain the benefits from different men at the optimal reproductive time. More specifically, women should generally prefer less masculine and less symmetrical men as long-term partners because these men are less likely to display as much competitiveness, aggression, mate guarding, or infidelity. In short, these men may make more exciting short-term relationship partners than long-term fathers. Conversely, when the risk of conception is high, women should prefer more masculine and more symmetrical men for the genetic benefits that might be passed onto their children.

These effects, however, should be moderated by the qualities of a woman's partner and the current relationship. Women mated to partners who are more symmetrical, more masculine, or more attractive may be less likely to seek out or be attracted to alternative partners, even during ovulation. Accordingly, women whose romantic partners are less symmetrical, less masculine, or less attractive may be more likely to seek and be attracted to alternative partners during ovulation.

Most past research has been conducted on single men or women using between subject designs. Relatively, little research has examined the perceptions and self-reported actions of women and men involved in ongoing relationships across the menstrual cycle. The goal of the present study was to test how the perceptions of one's relationship changes over the ovulatory cycle. It was predicted that: (1). Women should spend less time worrying about their current relationship when they are ovulating because their attention should be diverted to other attractive alternative partners; (2). Women should feel less jealous of their partners during ovulation because they are

investing less time and attention to their current relationship; (3). Women should be less upset with their current partners during ovulation because they are less attentive to their partners/relationships; (4). Men should detect these behaviors and confirm that their partners were less attentive to them during ovulation; (5). Men should also find their partners more attractive during ovulation (particularly with respect to her scent, due either the application of perfume or the secretion of attractive pheromones during ovulation); and (6). These effects may be amplified or dampened, depending on the male partner's perceived level of attractiveness or the perceived quality of the relationship.

The current study followed 45 dating couples for consecutive 30 days. Each day, couples completed daily diaries, answering questions about daily relationship quality, jealousy, alternative partners, and their sexual behavior.



## II. METHODS

### *Participants*

Forty-five couples were recruited from introductory psychology courses in exchange for 4 hours of credit and ten dollars (USD). The mean age for males was 19.3 ( $SD = 1.4$ ), and it was 18.7 ( $SD = 1.3$ ) for females. For men, the study included Caucasians (84 %), Hispanics (13%), and those indicating an other category (2%). For women, the study included Caucasians (84%), Hispanics (11%), African-Americans (3%), and Others (3%). All women in the study verified that they were not taking any type of hormone or steroidal medications before the study started.

### *Materials and Stimuli*

Participants first completed well-validated scales in a general questionnaire survey. These scales included the Sociosexuality Orientation Inventory (SOI; Simpson & Gangestad, 1992), the Big 5 Personality scale (John & Srivastava, 1999), the Adult Attachment Questionnaire (AAQ, Simpson, Rholes, & Phillips, 1996), the Interdependence Scale (Rusbult et al., 1998), the Perceived Relationship Quality Components Measure (PROC; Fletcher et al., 2000), the Aron Inclusion of Others in Self Scale (Aron et al., 1992), and the Best Alternative Partner Index (Simpson, 1987). These inventories were included to test the primary predictions. See Appendix A.

### *Procedure*

After signing the informed consent, both members of each couple completed the general survey, which also included basic demographic information. Each female participant then indicated (on a four-month calendar) the days of her last 2 menstruations

and then estimated the timing of her next two menstruations. Each female participant also provided information on her menstrual cycle length, regularity, typical days of menstruation, and any use of hormonal products or medication.

The menstrual cycle information was then used to estimate when each female partner would most likely be ovulating during the study, using the reverse counting method (RCM) otherwise known as the Calendar Method (Fehring, 2005). The RCM estimates ovulation by counting backwards 14 days from a woman's last menstruation in order to estimate the next ovulation. A window of time (5-10 days) for each female was then identified. Specifically, each woman's ovulation dates for the next four months were estimated. This method permits one to obtain better estimates of the 5-10 day window when each woman will be ovulating.

During these 5-10 days, each female participant was instructed to provide a saliva sample each morning immediately after waking so that ovulation could be confirmed. Each morning, each participant recorded the time of collection and then collected the saliva on a microscope slide. Using a finger, each participant was instructed to swipe non-foamy saliva from under the tongue and applied it to the microscope slide. A cover slip was then placed over the saliva, which was then allowed to dry. This protocol was followed during the targeted 5-10 days of the diary period.

Both partners then completed the first day of the first diary packet (7 days of diaries in all) in case any questions about the diaries should arise. After leaving the lab, both partners in each relationship completed one diary each day and returned the set of packets the following week. Upon returning a packet, each partner received a new

packet (the next seven days) to complete. This process continued until 30 consecutive days of diaries were completed. During the diary collection period, undergraduate research assistants contacted each couple via phone or email at least once a week to check on their progress. After completing 30 diary days and saliva samples, participants completed an exit survey and were debriefed.

### *Estimating Ovulation*

Four researchers examined each woman's slides and determined when each she was ovulating according to the Salivary Ferning method (Guida, et al, 1993). Inter-rater reliability for all the slides was less than one percent. Four days prior to ovulation and two days after, increases in minerals and estrogen present in each woman's saliva were detectable. Dried saliva samples have a fern pattern due the minerals, catecolestrongens, and estrogens during ovulation. The ovulation window of all 45 women was confirmed using the Salivary Ferning method. The mean number of ovulatory days for women was 5 days.

### *Reordering Diary Days*

Though the women in the study had fairly regular menstrual cycles, women were not on the same phase of the menstrual cycle at the same time. Thus, diary days for each couple were numbered according to each woman's specific menstrual cycle date. In particular, the day of ovulation was renumbered day 14, with the day after ovulation being renumbered day 15, and the day before ovulation being renumbered day 13. This process was repeated until the end of the 30 day period or until the woman began menstruating. The first day of a woman's menstruation was renumbered day zero. This

reordering process ensured that diaries for days 0-11 corresponded to pre-ovulatory days, days 12-16 corresponded to the ovulatory window, and days 17-30 corresponded to the post-ovulatory days. Thus, the description of day was relative to each woman's own menstrual cycle, not the day in which the participant completed a diary.

#### Data Set-up for Hierarchical Linear Modeling (HLM)

This data set is unique because it can be analyzed using either a 3-level method or a 2-level method within Hierarchical Linear Modeling (HLM). In the 3-level method, the diary days would serve as level 1 measures, the individual variables or general survey measures would serve as level 2 measures, and the couple measures would serve as level 3 measures. Using a 2-level method, the diary days and individual variables would serve as level 1 measures, and the couple measure would serve as level 2 measures. The 2 level method was chosen because it separates men and women within the level 1, allowing the statistical program to generate standard errors for the men and women separately. Using the 3-level method would result in a single standard error for both genders for the variables being analyzed. Because men and women were predicted to answer differently and to show different effects, it would have been inappropriate to use the 3-level method in HLM.

Two separate files were created for the data analyses. The first file consisted of items and sums from the general questionnaire survey. This file is referred to as the level-2 data. The information in this file included variables related to each couple. Variables such as whether or not the man or woman of the couple was more attractive were contained in this file. These variables were created by subtracting one partner's

score from the other partner's score. For example, within each couple, each man's degree of commitment was subtracted from his female partner's degree of commitment to assess relative couple-level commitment.

The second file consisted of individual-level information. This file is referred to as level 1. Each individual's daily diaries were entered in this file, with each day being listed in a single row. In each of the files, there were columns linking each individual to his/her diaries, and each individual to his/her partner's diaries. Additionally, each line had a corresponding day that served as the time variable. Because previous research suggests that behaviors could have a quadratic effect (i.e., peaking or falling during ovulation), the days variable was also calculated to test a quadratic model.

Because both men and women had diary data in level 1, the variables had to be divided into two columns so that models for each man and each woman could be tested. Thus, a male variable column and a female variable column for each variable were created. In the male variable columns, the males' data was entered on male diary days (rows), and a zero was entered on female diary days. For female variable columns, the females' data was entered on female diary days; and a zero was entered on male diary days. In addition, two new columns were created to delineate which ones contained female data and which ones contained male data. In the male variable column, male diary day lines had a corresponding one, and female diary day lines had a corresponding zero. In the female variable column, female diary day lines were labeled with a one, and male diary day lines were labeled with a zero.

*Testing Models and Predictions*

The predictions (quadratic models) were tested using Hierarchical Linear

Modeling 6.0 by setting up the following equations:

Level 1:

Outcome Variable = B1(male intercept) + B2(female intercept) + B3 (male quadratic time variable) + B4 (female quadratic time variable) + r

Level 2:

B1 = Y10+ Y11 (level 2 variable male) + error term

B2 = Y20 + Y21 (level 2 variable female) + error term

B3 = Y30

B4 = Y40

### III. RESULTS

#### *Descriptive Statistics*

Descriptive statistics were run on level-1 and level-2 variables (see Table 1). Means and standard deviations for these items are all based on a 7-point Likert scale. The mean for the item “Today, my partner seemed to be thinking too much about other opposite sex people” was 1.52, SD=1.11. The mean for the item “How jealous did you feel today because of something your partner said or did” was 1.63, SD = 1.21. The mean for the item “How upset would you be if your partner spent a significant amount of time with an attractive member of the opposite sex today” was 2.83, SD=1.97. The mean for the item “Today, my partner was more focused on my relationship” was 3.00, SD=1.79. These first four items were on the lower end of the scale. The mean for the item “How good did it feel to smell my partner’s scent today” was 5.52, SD= 1.28. This item’s mean is on the high end of the scale. The mean for the level-2 variable commitment was .08, SD=0.56. The mean for the level-2 variable attractiveness was .63, SD=1.14.

T-tests were then next run on the level-1 data. The results are also reported in Table 1. For the item ““Today, my partner seemed to be thinking too much about other opposite sex people”, results indicated that men reported that their partners seemed to be thinking too much about other opposite sex people than did women about their partners,  $t(1230)= 5.394, p=0.001$ . For the item “How jealous did you feel today because of something your partner said or did”, the results also indicated that men felt more jealous than women did,  $t(1233)= 3.378, p=0.001$ . For the item “How upset would you be if

your partner spent a significant amount of time with an attractive member of the opposite sex today”, the results revealed no significant difference in men’s and women’s reports,  $t(1243) = -0.127$ , ns. For the item “Today, my partner was more focused on my relationship”, women reported that that their partners were more focused on the relationship than men did,  $t(1229) = -2.28$ ,  $p = 0.02$ . For the item “How good did it feel to smell my partner’s scent today”, men rated this item higher than did women,  $t(1159) = 5.52$ ,  $p = 0.007$ .

### *Tests of Predictions*

Each primary prediction hypothesis was then tested. For the prediction that women should spend less time worrying about their current relationship during ovulation (Prediction 1), the quadratic model of the dependent variable reported by women, “Today my partner seemed to be thinking too much about other opposite sex people”, was significant,  $t(2474) = -2.09$ ,  $p = .03$ . This effect indicates that, during ovulation, women were *less* likely to believe that their partners were thinking about other women. Importantly, however, men’s level of commitment moderated this effect, such that women who had more committed male partners reported that they were *less* likely to believe that their partners were thinking about other women,  $t(2472) = -2.11$ ,  $p = .03$ .

To test Prediction 2, that women should feel less jealous of their partners during ovulation, the item, “How jealous did you feel today because of something your partner said or did” reported by women was also significant,  $t(2474) = -2.27$ ,  $p = .02$ . This result shows that women reported feeling less jealous because of something their partner said



or did on days when they were ovulating. Supporting Prediction 6, women who had more attractive partners, however, reported a smaller change in jealousy during ovulation than did women who had less attractive partners,  $t(2475) = -2.26, p = .02$ . This finding supports the premise that women should be less likely to notice alternative partners and invest more in their relationship during ovulation if they are mated with someone whom they view as a more attractive partner/mate.

To test Prediction 3, that women should be less upset with their partners during ovulation, women rated “How upset would you be if your partner spent a significant amount of time with an attractive member of the opposite sex today.” The results indicated that women also rated this diary item lower when they were ovulating,  $t(2487) = -2.31, p = .02$ . Nevertheless, women who reported that they had more attractive partners reported a smaller change in being upset during ovulation than did women who reported having less attractive partners,  $t(2485) = -2.30, p = .02$ . This finding provides further support for the prediction that women who are mated with men whom they perceive as more attractive tend to think about alternative partners less often.

To test Prediction 4, that men should feel that their partners are less attentive to them during ovulating, men responded to the item, “Today, my partner was more focused on my (our) relationship.” As predicted, men reported that their partners seemed less focused during ovulation than at other times of the menstrual cycle,  $t(2473) = 1.907, p = .056$ , although this effect was marginally significant. Supporting previous findings, highly committed men, however, were reported by their female partners as being more focused on the relationship during ovulation than were less committed

men,  $t(2471) = 2.31, p = .02$ .

With regard to Prediction 5, during ovulation, men also tended to prefer their partner's scent to a greater extent,  $t(2474) = 1.89, p = .058$ , although this effect was also marginally significant. This trend supports the conjecture that men should find their partners more attractive during ovulation, particularly their partner's scent. This test, however, does not distinguish whether women's more attractive scent was attributable to the fact that women used more cosmetic products (Grammer, 1992) or whether secreted pheromones might have increased their attractiveness during ovulation (see Singh, 2001).

#### IV. DISCUSSION AND CONCLUSIONS

This study examined changes in perceptions of romantic partners and relationships across the menstrual cycle. Based on past data and the theorized functions of good genes versus good provider models of mating, it was predicted that women would be less interested in their primary partners during ovulation. This effect, however, should be moderated by specific partner and relationship qualities. In particular, it was hypothesized that the fewer preferred qualities (i.e. masculinity, attractiveness, symmetry) a man possesses and the poorer a relationship is perceived to be should be associated with larger negative changes in certain perceptions and behaviors in the women. More specifically, these women should focus less on their relationships, spend less time thinking about their partners, and spend less time worrying about their relationships. Men should also pick up on these perceptions and behaviors and corroborate them. In addition, men should perceive their partners as more attractive when they are ovulating.

As predicted, women did report worrying less about their partners, spending less time, and being less upset or jealous of their partners when they were ovulating than when they were not. As expected, partner commitment and attractiveness also moderated these effects. Women who had more committed partners were less likely to believe that their partners were thinking about other women. Women who had less attractive partners tended to be less upset or jealous of their partners relative to women who had more attractive partners, especially during ovulation.

Men also reported that their female partners seemed less focused on their

relationship when they were ovulating and found their partner's scent to be more attractive than at other times of the menstrual cycle.

This study demonstrates that perceptions, behavior, and relationship quality do, in fact, systematically change across the menstrual cycle. Even more importantly, the study also examined variables that moderate the strength and direction of these effects. Although this study did not include reports from each participant's alternative partners, the presence of a good alternative partner may amplify the changes documented across the menstrual cycle in this study. Women who report having better alternative partners (i.e., alternatives who were more attractive, more masculine, or more symmetrical than their current primary partner) would be predicted to evince even stronger ovulation effects. In particular, such women should be even less jealous of their primary partners and worry even less about their primary partners during ovulation compared to women who do not have good alternative partners.

Although men reported that they found their partner's scent to be more attractive when she was ovulating, this study could not verify whether the scent was more attractive due to the application of more cosmetics during ovulation (i.e., sexual signaling; Grammer, 1992) or whether their partner's actually smelled better due to the natural release of pheromones (Singh and Bronstad, 2001). Either explanation for this ovulation effect, however, is consistent with evolutionary theory, but does not directly support strategic pluralism. If the women were engaging in sexual signaling (applying more cosmetics) during ovulation, then it would direct evidence of strategic pluralism.

Although the current results provide evidence that women tend to be less focused

on their current relationships during ovulation, it does not provide evidence that women were actually thinking about other alternative partners, spending time with alternative partners, or engaging in activities to attract alternative partners. The current results only show that women are perhaps preoccupied or distracted from their primary relationships during ovulation.

Additionally, devoting less time and attention to a primary relationship is not indicative of engaging in short-term mating strategies or pursuing short-term relationships with other alternative partners during ovulation. This study did not demonstrate that women were spending more time with alternative partners, engaging in more sexual signaling with respect to alternative partners, or engaging in extra-pair copulations with them.

One question that the current study does not answer is whether these effects are amplified or attenuated in highly committed couples, specifically married couples. Engaging in extra-pair relationships while being married carries much harsher consequences than doing so in dating relationships. Though it might be expected that married women would show weaker ovulation effects because they are in more highly committed relationships, the opposite might also be true. Married women may, in fact, show increased ovulation effects in their current relationship during ovulation because it is more complicated to leave many marriages. Women who are married to less attractive, less masculine, and less symmetrical men may, therefore, engage in extra-pair copulations as the only option for obtaining “good genes.” Women who are in dating relationships, on the other hand, can still terminate their relationships relatively easily

and obtain “good genes” from their next dating partner.

Another question that the current study does not address is how much time women actually spent with their potential alternative partners during ovulation, if any. Strategic pluralism would predict that women who have less attractive, less symmetrical, and less masculine primary partners should spend more time with potential alternative partners during ovulation, especially if the alternatives are more attractive, more symmetrical, and more masculine than the woman’s primary partner. However, this study did not gather information on how women’s alternative partners actually compared to their primary partners.

These findings are unique in relation to the past research in that they reveal important dynamics in established romantic relationships. Past studies typically have assessed only one partner in a relationship without taking into account critical partner variables that may moderate ovulation effects. By using couples, this study was able to document changes in perceptions of the relationship in both men *and* women during the menstrual cycle and to examine the specific variables that moderated these ovulation effects.

The current results also provide indirect support for the strategic pluralism model. In particular, they suggest that women may value their current relationships less during ovulation and might engage in short-term mating strategies when their primary partners are lacking in viability indicators or their primary relationships are deficient in perceived quality. During other phases of the menstrual cycle, however, women may be more inclined to pursue long-term mating strategies, especially with mates who display

evidence of being “good fathers.” As a result, women should be more attentive to and should value their primary partners more when they are not ovulating.

The findings of this study add to a growing body of data suggesting that both women’s behaviors and preferences for men systematically change across the menstrual cycle. Specifically, women tend to prefer more masculine men, more attractive men, and more symmetrical men during ovulation than at other phases of the menstrual cycle (Johnston et al, 2001; Penton-Voak et al., 1999; Thornhill and Gangestad, 1999).

Women also engage in more sexual signaling and are more interested in sex during the ovulatory phase of the menstrual cycle (Grammer, 1996; Haselton and Gangestad, 2003).

Once in a relationship, women might display these preferences by spending less time with their primary partners, especially if their partners are less attractive, less masculine, or less symmetrical. Men did, in fact, report that their partners tended to be less focused on the relationship when they were ovulating, and that their partner’s scent was also more attractive during ovulation. These results are consistent with past research examining men’s responses to partners who are in the ovulatory phase of the menstrual cycles (Singh and Bronstad, 2001).

Though not directly testing whether or not women engaged in different types of mating strategies during ovulation, this study did examine other behavioral changes that may be indicative of strategic pluralism tendencies. These behaviors include being less attentive to one’s primary partner, worrying less about one’s primary partner, and being less jealous about one’s primary partner. These behavioral changes, however, are

merely indicators that women perceive their relationships differently during ovulation than at other times of their menstrual cycles.

In conclusion, this study found indirect evidence for strategic pluralism effects (i.e., that women spend less time on their primary relationship when ovulating). This study also found that men were aware of their partner's behavioral changes during ovulation (i.e., that women seemed less focused on their relationship when ovulating).

Additionally, this study found that both relationship variables (i.e., commitment) and partner variables (i.e., attractiveness) moderated these behavioral changes during ovulation. Women who were involved with more viable partners showed less evidence of these strategic pluralism effects during ovulation than did women who had less viable partners. Moreover, women in more committed relationships also showed less changes in critical relationship perceptions during ovulation.



## REFERENCES

- Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of Other in the Self Scale and the structure of interpersonal closeness. *Journal of Personality & Social Psychology*, 63(4), 596-612.
- Baker, R. R., & Bellis, M. A. (1995). *Human sperm competition*. London; Chapman & Hall.
- Buss, D. M. & Schmitt, D. P. (1993). Sexual strategies theory: an evolutionary perspective on human mating. *Psychological Review*, 100, 204-232.
- Fehring, R.J.(2005). New low-and high-tech calendar methods of family planning. *Journal of Midwifery and Women's Health*, 50(1), 31-38.
- Fletcher, G. J., Simpson, J. A., & Thomas, G. (2000). The measurement of perceived relationship quality components: a confirmatory factor analytic approach. *Personality & Social Psychology Bulletin*, 26(3), 340-354.
- Gangestad, S.W. (1993). Sexual selection and physical attractiveness: implications for mating dynamics. *Human Nature*, 4, 205-235.
- Gangestad, S.W. & Simpson, J. A. (2000). The evolution of human mating: trade-offs and strategic pluralism. *Behavioral and Brain Sciences*, 23, 573-644.
- Gangestad, S. W., & Thornhill, R. (1998). Menstrual cycle variation in women's preference for the scent of symmetrical men. *Proceedings of the Royal Society of London B*, 262, 727-733.
- Garver-Apgar, C., Gangestad, S.W., and Simpson, J.A. (2003, June). Changes in women's sexual interests across the ovulatory cycle: the moderating effects of

mates' symmetry. *Paper presented at the meeting of Human Behavior and Evolution Society, Lincoln, NE.*

Grammer, K. (1992). Variations on a theme: age dependent mate selection in humans. *Behavioral and Brain Sciences*, 15, 100-102.

Grammer, K. (1996, June). The human mating game: the battle of the sexes and the war of signals. *Paper presented to the Human Behavior and Evolution Society Annual Meeting, Northwestern University, Evanston, IL.*

Grammer, K. & Thornhill, R. (1994). Human (homo sapiens) facial attractiveness and sexual selection: the role of symmetry and averageness. *Journal of Comparative Psychology*, 108, 233-242.

Guida, M., Barbato, M., Bruno, P., Lauro, G., & Lampariello, C. (1993). Salivary ferning and the menstrual cycle in women. *Clinical and Experimental Obstetrics and Gynecology*, 20(1), 48-54.

Haselton, M.G., & Gangestad, S. W. (2003) Conditional expression of female desires and male mate retention efforts across the human ovulatory cycle. Unpublished manuscript. Department of Communication, University of California – Los Angeles.

John, O. P. & Srivastava, S. (1999). The Big Five trait taxonomy: history, measurement, and theoretical perspectives. In L.A. Pervin & O.P. John (Eds.) *Handbook of personality: theory and research*. 2<sup>nd</sup> ed., (pp. 102 –138). New York: Guilford Press.

Johnston, V. S., Hagel, R., Franklin, M., Fink, B. & Grammer, K. (2001). Male facial

- attractiveness: evidence for hormone mediated adaptive design. *Evolution and Human Behavior* 23, 251-267.
- Penton-Voak, I.S., Perrett, D. I., Castles, D., Burt, M., Koyabashi, T., & Murray, L. K. (1999). Female preference for male faces changes cyclically. *Nature*, 399, 741-742.
- Rusbult, C. E., Martz, J. M., & Agnew, C. R. (1998). The Investment Model Scale: measuring commitment level, satisfaction level, quality of alternatives, and investment size. *Personal Relationships*, 5(4), 357-391.
- Simpson, J. A. (1987). The dissolution of romantic relationships: factors involved in relationship stability, factors involved in emotional distress. *Dissertation Abstracts International*, 47, 8b, 3546.
- Simpson, J. A., & Gangestad, S. W. (1992). Sociosexuality and romantic partner choice. *Journal of Personality*, 60, 31-51.
- Simpson, J. A., Rholes, W. S., & Phillips, D. (1996). Conflict in close relationships: an attachment perspective. *Journal of Personality and Social Psychology*, 71(5), 899-914.
- Singh, D., & Bronstad, P.M. (2001). Female body odor is a potential cue to ovulation. *Proceedings of the Royal Society of London B*, 268, 797-801.
- Stanislaw, H., & Rice, F. J. (1998). Correlation between sexual desire and menstrual cycle characteristics. *Archives of Sexual Behavior*, 17, 499-508.
- Thornhill, R., & Gangestad, S. (1993). Human facial beauty: averageness, symmetry and parasite resistance. *Human Nature*, 4, 237-269.

Thornhill, R., & Gangestad, S. (1999). Facial attractiveness. *Trends in Cognitive Sciences*, 3(12),452-460.

## APPENDIX A

## TABLES

Table 1

<b>Diary Items: Descriptive Statistics and Paired T-tests</b>	<b>Mean</b>	<b>SD</b>	<b>Mean for Men</b>	<b>Mean for Women</b>	<b>T</b>	<b>Df</b>	<b>Sig. (2-tailed)</b>
<b>Level-1 Variables</b>							
Today, my partner seemed to be thinking too much about other opposite sex people.	1.52	1.11	1.63	1.40	5.394	1230	0.00*
How jealous did you feel today because of something your partner said or did?	1.63	1.21	1.70	1.54	3.378	1233	0.001*
How upset would you be if your partner spent a significant amount of time with an attractive member of the opposite sex today?	2.83	1.97	2.82	2.83	-0.127	1243	0.899
Today, my partner was more focused on my relationship.	3.00	1.79	2.92	3.08	-2.28	1229	0.023*
Compared to most days, how good did it feel to smell your partner's scent today?	5.52	1.28	5.46	5.58	-2.68	1159	0.007*
<b>Level-2 Variables</b>							
Commitment	.08	0.56					
Attractiveness	.63	1.14					

Table 2

<b>Diary Items: Quadratic Models</b>	<b>T</b>	<b>Df</b>	<b>Sig. (2-tailed)</b>
Today, my partner seemed to be thinking too much about other opposite sex people.	-2.09	2474	0.03
*Level-2 Commitment	-2.11	2472	0.03
How jealous did you feel today because of something your partner said or did?	-2.27	2474	0.02
*Level-2 Attractiveness	-2.23	2475	0.02
How upset would you be if your partner spent a significant amount of time with an attractive member of the opposite sex today?	-2.31	2487	0.02
*Level-2 Attractiveness	-2.30	2485	0.02
Today, my partner was more focused on my relationship.	1.907	2473	0.056
*Level-2 Commitment	2.31	2471	0.02
Compared to most days, how good did it feel to smell your partner's scent today?	1.89	2474	0.058

**APPENDIX B****GENERAL SURVEY**

Couple Number : \_\_\_\_\_ Today's Date: \_\_\_\_\_

Please answer the following questions directly on this page.

1. Are you a male or a female? (Check one).

- ① Male
- ② Female

2. What is your ethnicity?

- ① Hispanic
- ② Asian
- ③ Caucasian (white)
- ④ African American
- ⑤ Other (please specify \_\_\_\_\_)

3. How old are you? \_\_\_\_\_

4. What is your current dating status? (Check one).

- ① not dating anyone
- ② dating a current partner and others
- ③ dating a current partner and no one else
- ④ engaged
- ⑤ married

5. How long have you been dating exclusively (in months)? \_\_\_\_\_

6. Do you and your partner use any type of hormonal birth control or medication including but not limited to the Pill, Lunelle, Depo-Provera, the Patch, Norplant, or steroids.

① yes

② no

### Relationship History Questionnaire

Please answer all of the following questions honestly. Your responses are guaranteed to be totally confidential. For the questions about behavior, write your answers in the blank spaces provided. For the questions about thoughts and attitudes, circle the appropriate number on the scales provided. The term "sexual intercourse" refers to genital sex.

1. With how many different partners have you had sex (sexual intercourse) within the past year? \_\_\_\_\_

2. With how many different partners have you had sex (sexual intercourse) within your lifetime? \_\_\_\_\_

3. How many different partners do you foresee yourself having sex with during the next five years? (Please give a specific, realistic estimate). \_\_\_\_\_

4. With how many different partners have you had sex on one and only one occasion? \_\_\_\_\_

5. How often do you fantasize about having sex with someone other than your current dating partner? (Circle one).

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

6. Sex without love is OK.

①

②

③

④

⑤

⑥

⑦

⑧

⑨

I strongly disagree

I strongly agree

7. I can imagine myself being comfortable and enjoying "casual" sex with different partners.



①      ②      ③      ④      ⑤      ⑥      ⑦      ⑧      ⑨

I strongly disagree

I strongly agree

8. I would have to be closely attached to someone (emotionally and psychologically) before I could feel comfortable and fully enjoy having sex with him or her.

①      ②      ③      ④      ⑤      ⑥      ⑦      ⑧      ⑨

I strongly disagree

I strongly agree

### RELATIONSHIP MEASURE

The following statements concern how you feel in romantic relationships. We are interested in how you generally experience relationships, not just in what is happening in a current relationship. Respond to each statement by indicating how much you agree or disagree with it. Bubble in your responses on this scantron.

Disagree strongly  
strongly

Neutral/mixed

Agree

1                      2                      3                      4                      5                      6                      7

1. I prefer not to show a partner how I feel deep down.

①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦

2. I worry about being abandoned.

①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦

3. I am very comfortable being close to romantic partners.

①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦

4. I worry a lot about my relationships.

①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦

5. Just when my partner starts to get close to me, I find myself pulling away.

①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦

6. I worry that romantic partners won't care about me as much as I care about them.

①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦

7. I get uncomfortable when a romantic partner wants to be very close.

①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦

8. I worry a fair amount about losing my partner.

①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦

9. I don't feel comfortable opening up to romantic partners.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
10. I often wish that my partner's feelings for me were as strong as my feelings for him/her.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
11. I want to get close to my partner, but I keep pulling back.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
12. I often want to merge completely with romantic partners, and this sometimes scares them away.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
13. I am nervous when partners get too close to me.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
14. I worry about being alone.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
15. I feel comfortable sharing my private thoughts and feelings with my partner.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
16. My desire to be very close sometimes scares people away.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
17. I try to avoid getting too close to my partner.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
18. I need a lot of reassurance that I am loved by my partner.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
19. I find it relatively easy to get close to my partner.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
20. Sometimes I feel that I force my partners to show more feeling, more commitment.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
21. I find it difficult to allow myself to depend on romantic partners.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
22. I do not often worry about being abandoned.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
23. I prefer not to be too close to romantic partners.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
24. If I can't get my partner to show interest in me, I get upset or angry.

- ①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
25. I tell my partner just about everything.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
26. I find that my partner(s) don't want to get as close as I would like.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
27. I usually discuss my problems and concerns with my partner.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
28. When I'm not involved in a relationship, I feel somewhat anxious and insecure.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
29. I feel comfortable depending on romantic partners.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
30. I get frustrated when my partner is not around as much as I would like.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
31. I don't mind asking romantic partners for comfort, advice, or help.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
32. I get frustrated if romantic partners are not available when I need them.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
33. It helps to turn to my romantic partner in times of need.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
34. When romantic partners disapprove of me, I feel really bad about myself.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
35. I turn to my partner for many things, including comfort and reassurance.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦
36. I resent it when my partner spends time away from me.  
①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦

## THE PERSONALITY PROFILE

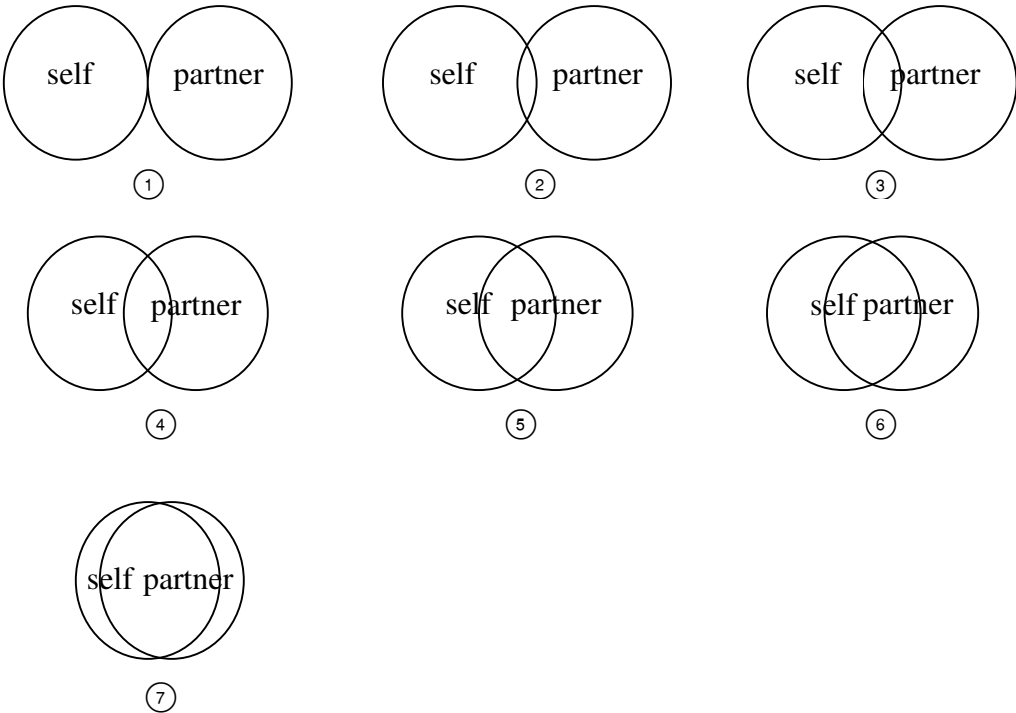
For each of the following items, honestly indicate whether you agree or disagree that each statement applies to your personality. Use the following scale.

1	2	3	4	5	
disagree strongly	disagree a little	neither agree nor disagree	agree a little	agree strongly	
1. I am outgoing, sociable	①	②	③	④	⑤
2. I tend to find fault with others	①	②	③	④	⑤
3. I am a reliable worker	①	②	③	④	⑤
4. I remain calm in intense situations	①	②	③	④	⑤
5. I value artistic, aesthetic experiences	①	②	③	④	⑤
6. I am reserved	①	②	③	④	⑤
7. I am considerate and kind to almost everyone	①	②	③	④	⑤
8. I can be somewhat careless	①	②	③	④	⑤
9. I am relaxed, handle stress well	①	②	③	④	⑤
10. I prefer work that is routine and simple	①	②	③	④	⑤
11. I am full of energy	①	②	③	④	⑤
12. I can be cold and aloof	①	②	③	④	⑤

13. I do things efficiently  
①                      ②                      ③                      ④                      ⑤
14. I get nervous easily  
①                      ②                      ③                      ④                      ⑤
15. I have an active imagination  
①                      ②                      ③                      ④                      ⑤
16. I am sometimes shy, inhibited  
①                      ②                      ③                      ④                      ⑤
17. I like to cooperate with others  
①                      ②                      ③                      ④                      ⑤
18. I tend to be disorganized  
①                      ②                      ③                      ④                      ⑤
19. I am emotionally stable, not easily upset  
①                      ②                      ③                      ④                      ⑤
20. I have few artistic interests  
①                      ②                      ③                      ④                      ⑤
21. I am talkative  
①                      ②                      ③                      ④                      ⑤
22. I am sometimes rude to others  
①                      ②                      ③                      ④                      ⑤
23. I do a thorough job  
①                      ②                      ③                      ④                      ⑤
24. I am depressed, blue  
①                      ②                      ③                      ④                      ⑤
25. I am sophisticated in art, music, or literature  
①                      ②                      ③                      ④                      ⑤
26. I tend to be quiet  
①                      ②                      ③                      ④                      ⑤
27. I am generally trusting  
①                      ②                      ③                      ④                      ⑤

- 28. I am lazy at times  
①                      ②                      ③                      ④                      ⑤
- 29. I worry a lot  
①                      ②                      ③                      ④                      ⑤
- 30. I am ingenious, a deep thinker  
①                      ②                      ③                      ④                      ⑤
- 31. I generate a lot of enthusiasm  
①                      ②                      ③                      ④                      ⑤
- 32. I have a forgiving nature  
①                      ②                      ③                      ④                      ⑤
- 33. I am easily distracted  
①                      ②                      ③                      ④                      ⑤
- 34. I can be tense  
①                      ②                      ③                      ④                      ⑤
- 35. I am inventive  
①                      ②                      ③                      ④                      ⑤

**Please circle the picture that best describes your relationship with your dating partner.**



***Instructions:*** Please indicate what your current partner/relationship is like, answering each question that follows. Use this scale when answering each question:

1      2      3      4      5      6      7

---

not at all

extremely

1. How satisfied are you with your relationship?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

2. How content are you with your relationship?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

3. How happy are you with your relationship?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

4. How committed are you to your relationship?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

5. How dedicated are you to your relationship?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

6. How devoted are you to your relationship?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

7. How intimate is your relationship?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

8. How close is your relationship?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

9. How connected are you to your partner?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

10. How much do you trust your partner?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

11. How much can you count on your partner?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

12. How dependable is your partner?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

13. How passionate is your relationship?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

14. How lustful is your relationship?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

15. How sexually intense is your relationship?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

16. How much do you love your partner?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

17. How much do you adore your partner?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

18. How much do you cherish your partner?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

How physically attractive are you compared to people your age? Please indicate what percentage of the population you are more attractive than (for examples, indicate a 5 for more attractive than 50% of the population of people your age)?

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

How physically attractive is your partner compared to people your age? Please indicate what percentage of the population your partner is more attractive than (for examples, indicate a 5 for more attractive than 50% of the population of people your age)?

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10)





4) How does your relationship compare to your ideal?

(0) (1) (2) (3) (4) (5) (6) (7) (8)  
 Far From Ideal Close To Ideal

1) How attractive are the people other than your partner with whom you could become involved?

(0) (1) (2) (3) (4) (5) (6) (7) (8)  
 Alternatives Not At All Appealing Alternatives Are Extremely Appealing

2) If you weren't dating your current partner, would you do okay – would you find another appealing person to date?

(0) (1) (2) (3) (4) (5) (6) (7) (8)  
 Hard to Find Another Partner Easy to Find Another Partner

3) How would you feel about not being in a dating relationship; how would you feel about spending time socially with friends and family instead?

(0) (1) (2) (3) (4) (5) (6) (7) (8)  
 I'd Feel Terrible I'd Feel Fine

4) How do your alternatives (dating another, spending time alone, etc.) compare to your relationship with your partner?

(0) (1) (2) (3) (4) (5) (6) (7) (8)  
 Alternatives Are Much Worse Alternatives Are Much Better

1) Have you put things into your relationship that you would in some sense lose if the relationship were to end (e.g., time spent together, secrets disclosed to one another, memories you share)?

(0) (1) (2) (3) (4) (5) (6) (7) (8)

Put Nothing  
Into Relationship

Put Everything  
Into Relationship

2) Are there things that are now "tied" to your relationship that you would in some sense lose if the relationship was to end (e.g., shared friends, material possessions [furniture, car], housing)?

①      ②      ③      ④      ⑤      ⑥      ⑦      ⑧  
Nothing Tied      Everything Tied  
To Relationship      To Relationship

3) Are there special activities associated with your relationship that you would in some sense lose (or they'd be more difficult) if the relationship were to end (e.g., recreational activities, job)?

①      ②      ③      ④      ⑤      ⑥      ⑦      ⑧  
No Activities      Many Activities

4) How much have you got invested in your relationship – things that you've put into it, things that are tied to it, activities that are connected to it, etc.?

①      ②      ③      ④      ⑤      ⑥      ⑦      ⑧  
Nothing      A Great Deal

Think about the one person you know (other than your current dating partner) whom you might like or want to date. This person is your **best alternative dating partner**. Now think about the benefits (the rewards versus the costs) of dating your best alternative partner compared to dating your current partner. Answer the following questions, using this scale.

- 1 = much less than
- 2 = less than
- 3 = slightly less than
- 4 = the same as
- 5 = slightly more than
- 6 = more than
- 7 = much more than

1. When it comes to dating someone who has (or will have) financial resources, the benefits of dating my best alternative dating partner would be \_\_\_\_\_ those of dating my current partner.

Much Less than ①      ②      ③      ④      ⑤      ⑥      ⑦ Much More than

2. When it comes to dating someone who is physically attractive, the benefits of dating my best alternative dating partner would be \_\_\_\_\_ those of dating my current partner.

Much Less than ①      ②      ③      ④      ⑤      ⑥      ⑦ Much More than

3. When it comes to dating someone who can provide emotional support, the benefits of dating my best alternative dating partner would be \_\_\_\_\_ those of dating my current partner.

Much Less than ①      ②      ③      ④      ⑤      ⑥      ⑦ Much More than

4. When it comes to dating someone who is reliable and trustworthy, the benefits of dating my best alternative dating partner would be \_\_\_\_\_ those of dating my current partner.

Much Less than ①      ②      ③      ④      ⑤      ⑥      ⑦ Much More than

5. When it comes to dating someone who has values and attitudes similar to mine, the benefits of dating my best alternative dating partner would be \_\_\_\_\_ those of dating my current partner.

Much Less than ①      ②      ③      ④      ⑤      ⑥      ⑦ Much More than

6. When it comes to dating someone who is kind and understanding, the benefits of dating my best alternative dating partner would be \_\_\_\_\_ those of dating my current partner.

Much Less than ①      ②      ③      ④      ⑤      ⑥      ⑦ Much More than

7. When it comes to dating someone who has activity interests similar to mine, the

benefits of dating my best alternative dating partner would be \_\_\_\_\_ those of dating my current partner.

Much Less than ①      ②      ③      ④      ⑤      ⑥      ⑦ Much More than

8. When it comes to dating someone who has a stable, pleasant personality, the benefits of dating my best alternative dating partner would be \_\_\_\_\_ those of dating my current partner.

Much Less than ①      ②      ③      ④      ⑤      ⑥      ⑦ Much More than

9. When it comes to dating someone who has (or will have) high social status, the benefits of dating my best alternative dating partner would be \_\_\_\_\_ those of dating my current partner.

Much Less than ①      ②      ③      ④      ⑤      ⑥      ⑦ Much More than

10. When it comes to dating someone with whom I can (could) be close and intimate, the benefits of dating my best alternative dating partner would be \_\_\_\_\_ those of dating my current partner.

Much Less than ①      ②      ③      ④      ⑤      ⑥      ⑦ Much More than

11. When it comes to dating someone who is sexually attractive, the benefits of dating my best alternative dating partner would be \_\_\_\_\_ those of dating my current partner.

Much Less than ①      ②      ③      ④      ⑤      ⑥      ⑦ Much More than

12. All things considered, the benefits of dating my best alternative dating partner would be \_\_\_\_\_ those of dating my current partner.

Much Less than ①      ②      ③      ④      ⑤      ⑥      ⑦ Much More than

## APPENDIX C

## DIARIES

Researchers' Use Only									
Couple Number (MDAS): _____									
Day: (1) (2) (3) (4)									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(0)

**Daily Diary**

Today's date: \_\_\_\_\_ Time now: \_\_\_\_\_

Please answer the following questions by darkening (filling in) the proper number for each question:

How satisfied are you with your relationship today? Not at all (1) (2) (3) (4) (5) (6) (7)  
Extremely

How committed are you to your relationship today? Not at all (1) (2) (3) (4) (5) (6) (7)  
Extremely

How emotionally intimate is your relationship today? Not at all (1) (2) (3) (4) (5) (6) (7)  
Extremely

How much do you trust your partner today? Not at all (1) (2) (3) (4) (5) (6) (7)  
Extremely

How passionate is your relationship today? Not at all (1) (2) (3) (4) (5) (6) (7)  
Extremely

How much do you love your partner today? Not at all (1) (2) (3) (4) (5) (6) (7)  
Extremely

To what degree do you feel:

That your relationship will continue to develop positively? Not at all (1) (2) (3) (4) (5) (6) (7)  
Extremely

That your relationship is strong and secure? Not at all (1) (2) (3) (4) (5) (6) (7)  
Extremely

That your relationship may be ending soon? Not at all (1) (2) (3) (4) (5) (6) (7)  
Extremely

To what degree did you feel \_\_\_\_ today?

Happy Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

Relaxed Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

Angry Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

Energetic Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

Sad Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

Anxious Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

To what degree did you experience:

Conflict or other negative events with your partner today? Not at all (1) (2) (3) (4) (5) (6) (7) A great deal

Support or other positive events with your partner today? Not at all (1) (2) (3) (4) (5) (6) (7) A great deal

Conflict or other negative events with individuals other than your partner today?  
Not at all (1) (2) (3) (4) (5) (6) (7) A great deal

Who was this person with whom you experienced conflict or negative events?  
(1) same-sex friend (2) opposite-sex friend (3) co-worker (4) parent or sibling (5) stranger

Support or other positive events with individuals other than your partner today?  
Not at all (1) (2) (3) (4) (5) (6) (7) A great deal

Who was this person with whom you experienced support or other positive events?  
(1) same-sex friend (2) opposite-sex friend (3) co-worker (4) parent or sibling, (5) stranger

Did you interact face-to-face for at least 10 minutes with your partner today? (1) Yes (2) No

If no, how long have you and your partner not interacted face-to-face? \_\_\_\_\_ days \_\_\_\_\_ hours

To what degree was today a typical day in your relationship? Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

How attractive as a romantic partner did you feel today? Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

How jealous did you feel today because of something your partner said or did?  
Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

How upset would you be if your partner spent a significant amount of time with an attractive member of the opposite-sex today?  
Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

To what extent are other good, long-term dating partners available to you (i.e., attractive opposite-sex people other than your current partner who would make marriage partners)?  
Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

To what extent are other good, available short-term dating partners available to you (i.e., attractive opposite-sex people who might be interested in having just a brief, short-term relationship with)?  
Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

## Your Partner

Each of the questions below asks you to give your best assessment of how your partner feels today:

How satisfied do you think your partner is with your relationship today?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

How committed do you think your partner is to your relationship today?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

How emotionally intimate do you think your partner feels toward your relationship today?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

How much do you think your partner trusts you today?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

How passionate do you think your partner feels about your relationship today?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

How much do you think your partner loves you today?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

Today, to what degree do you think that your partner feels:

That your relationship will continue to develop positively?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

That your relationship is strong and secure?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

That your relationship may be ending soon?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

To what degree do you think your partner's mood is \_\_\_\_ today?

Happy Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

Relaxed Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

Angry Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

Energetic Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

Sad Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

Anxious Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

Compared to most days, how attractive is your partner today?

Less attractive (1) (2) (3) (4) (5) (6) (7) More attractive

Compared to most days, how good did it feel to smell your partner's scent today?



Not good (1) (2) (3) (4) (5) (6) (7) Very good

Compared to most days, how nice was it to watch your partner do everyday things today?

Not at all (1) (2) (3) (4) (5) (6) (7) Extremely

Compared to most days, how much did you think about your partner today?

Not at all (1) (2) (3) (4) (5) (6) (7) A great deal

Today, my partner wanted to spend more time with me than normal.

I strongly disagree (1) (2) (3) (4) (5) (6) (7) I strongly agree

Today, my partner wanted to spend less time with me than normal.

I strongly disagree (1) (2) (3) (4) (5) (6) (7) I strongly agree

Today, my partner was less focused than usual on our relationship.

I strongly disagree (1) (2) (3) (4) (5) (6) (7) I strongly agree

Today, my partner was more focused than usual on our relationship.

I strongly disagree (1) (2) (3) (4) (5) (6) (7) I strongly agree

Today, it would bother me if my partner had a conversation with an attractive opposite-sex person.

I strongly disagree (1) (2) (3) (4) (5) (6) (7) I strongly agree

Today, my partner would be bothered if I had a conversation with an attractive opposite-sex person.

I strongly disagree (1) (2) (3) (4) (5) (6) (7) I strongly agree

Today, I felt that my partner did not pay enough attention to me.

I strongly disagree (1) (2) (3) (4) (5) (6) (7) I strongly agree

Today, my partner seemed to be thinking too much about other opposite-sex people.

I strongly disagree (1) (2) (3) (4) (5) (6) (7) I strongly agree

Today, my partner would not allow me to spend time alone.

I strongly disagree (1) (2) (3) (4) (5) (6) (7) I strongly agree

Today, I wanted my partner to show more commitment to me/our relationship.

I strongly disagree (1) (2) (3) (4) (5) (6) (7) I strongly agree

Today, I did not want my partner to spend much time his/her friends.

I strongly disagree (1) (2) (3) (4) (5) (6) (7) I strongly agree

Today, I felt that my partner ignored me.

I strongly disagree (1) (2) (3) (4) (5) (6) (7) I strongly agree

Today, I felt my partner was more concerned about what I did or who I was with, almost to the point of being controlling.

(1) yes (0) no

Today, I felt more concerned about what my partner did or who my partner was with, almost to the point of being controlling.

(1) yes (0) no

Today, I got so upset at my partner that I pushed, shoved, slapped, or hit him/her.

1 yes       0 no

Today, my partner got so upset at me that he/she pushed, shoved, slapped, or hit me.

1 yes       0 no

Did you(or your partner) have your/her period today?

1 yes       0 no

How severe was the pain?

Not at all  1  2  3  4  5  6  7 A great deal

Did you have sexual intercourse with your partner in the last 24 hours?

1 yes       0 no

Who initiated sex?

1 me       2 my partner       3 Both of us

## VITA

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#### Major Publications

Penton-Voak, I. S. & Chen, J. Y. (2004). High Salivary Testosterone linked to Masculine Male Facial Appearance in Humans. *Evolution and Human Behavior*, 21, 39-28.

Simpson, J. A., Winterheld, H., & Chen, J.Y. (in press). *Personality and Relationships: a Temperament Perspective*. Chapter in the *Relationship Handbook*.

#### Professional Contributions

*Ad Hoc Journal Reviewing*

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#### Professional Affiliations

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