

Acknowledgements

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Abstract

Women who use hormonal contraceptives have been shown to report more intense affective responses to partner infidelity than women with a natural cycle. Also, previous research suggests that female jealousy is sensitive to hormonal changes when naturally cycling, with a peak around ovulation, while women using hormonal contraceptives are less sensitive.

This research is aimed at exploring women's perception of couple conflicts in line with predictions derived from evolutionary theory. A factor analysis yielded four dimensions within 19 couple conflicts that were related to jealousy, emotional support, time and effort, and commitment. We tested the hypotheses that women who use hormonal contraceptives will react more strongly to jealousy-provoking scenarios and overall conflicts compared to women with a natural menstrual cycle. We also tested the hypotheses that naturally cycling women would show an increase in their emotional response to jealousy-provoking scenarios at days with high fertility risk. We expected that their emotional response to the scenarios infidelity, lack of emotional support, time and effort and lack of commitment, would increase if they perceived their partners as attractive.

By using an online questionnaire, we followed women who were currently in a relationship with age ranging from 18 to 30 years weekly for 12 weeks. Results show a significant difference between women using hormonal contraceptives and naturally cycling women. Women using hormonal contraceptives responded to be more upset by scenarios indicating infidelity, than did naturally cycling women ($p < .05$), but not on the overall conflicts. However, some unexpected differences on the single scenarios were discovered.

For the analysis concerning the fertility-effect, no significant main effect was found. However, our hypotheses were not supported ($p > .001$), Our results did, however, reveal a non-significant trending in the predicted direction indicating that the partner's attractiveness interact with fertility status and affect how women respond to situations regarding Jealousy and couple conflicts.

Keywords: hormonal contraceptives, menstrual cycle, couple conflicts, jealousy
evolutionary theory.

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Introduction

Conflicts in romantic relationships

Conflicts can be distressing, but conflicts in relationships may to a certain extent be healthy for a relationship. Conflict engagement is found to be helpful for the relationship longitudinally, except if the conflict indicates defensiveness, stubbornness and withdrawal (Gottman and Krokoff, 1989). There are other themes of conflicts as well, and housecleaning is found to be one of the most ordinary conflict areas among couples (Gottman, 1979; Mead, Vatcher, Wyne & Roberts, 1990; Heimdal, Dørmænen and Træen, 2008). Conflicts reflecting power and intimacy are also found to be negatively related to relationship satisfaction for many couples (Kurdek, 1994). Storaasli and Markman (1990) found that, in couples at a pre-marriage stage, the top argue-topics were money, jealousy, relatives and friends. Satisfaction in a romantic relationship is important for the relationship to be healthy, and a multidimensional view of marital satisfaction carried out by Lucas et al. (2008) suggests that both evolutionarily invariant and culturally unique criteria may be reflected in marital satisfaction ratings of husbands and wives (Lucas et al., 2008). The findings of Lucas et al. (2008) suggest that the measure of marital satisfaction is complex and that it includes both cultural and evolutionary perspectives. Communication and support within the relationship is suggested to enhance caregiving, hence if a couple are unsupportive of one another and have difficulties with coordinating routines, they may be less successful as parents (Lucas et al., 2008).

Jealousy

There is no doubt that jealousy is a source of great personal misery and an emotion that can lead to serious outcomes. For example, Morbid jealousy, which describes a range of irrational thoughts and emotions together with unacceptable or extreme behavior (Cobb, 1979). This is of course a type of jealousy that would ruin a relationship, rather than contributing positively. Jealousy is frequently implicated as a factor in relationship dissolution, spousal abuse and even murder (Harris, 2003a). However, jealousy may also have some positive effects for relationships, as it is believed to be an adapted emotion, which activates to protect the relationship from disaster (Buss et al., 1992).

The need for belonging seem to be a fundamental human motivation (Baumeister & Leary, 1995), and it follows us from early life with attachment to our caregivers up to adult life with our romantic partners (Conger, Sui, Bryant & Elder, 2000). Jealousy seems to occur both in friendship and in sexual relationships, but since jealousy is perceived to be more inappropriate in friendship, it is expressed less frequently in friendship compared to romantic relationships (Aune & Comstock, 1991). Jealousy in romantic relationships, the complex reaction which involves both physical symptoms and psychological distress, has been studied in various settings (Buss et al., 1992; Buss, 2000; Geary, DeSoto, Hoard, Sheldon & Cooper, 2001; Kennair et al., 2011), and is seen by evolutionary psychologists as an evolved adaptation (Buss et al., 1992). Infidelity as a prediction for divorce is found in almost every marriage theory (Betzig, 1989).

When threats occur in the relationship, jealousy is activated to protect the relationship from disaster (Buss et al., 1992). This can be explained by the consequences of infidelity and partner loss in view of reproduction (Feingold, 1992; Buss, 1992; Buss, 2000). If the woman's partner left her for the benefit of another woman, the loss of time, resources and commitment from their partner could lead to a tremendous outcome (Buss, 1988; Trivers, 1972). It seems like older women (mean age = 67 years) are less likely than younger women (mean age = 20 years) to be more distressed by a partner's emotional infidelity than a partner's sexual infidelity (Shackelford, Voraecck, Schmitt, Buss, Weekes-Shackelford, 2004). This is, according to Shackelford et al. (2004), because older women are less likely to have dependent children than younger women. Therefore, resources and investment might be less consequential for older women than for younger women.

Jealousy in men and women are in some respects found to be similar, while in others they differ (Buss, 2000; Geary, DeSoto, Hoard, Sheldon & Cooper, 2001). Men are predisposed to be upset by a mate's sexual infidelity, whereas women are predisposed to be upset by a mate's emotional infidelity (Buss, 2000), which is consistent with findings in a Norwegian study (Kennair et al., 2011). Compared to men, women process and show a greater recall for cues to emotional infidelity (Schutzwohl & Koch, 2004). Jealousy threat is reported to decrease levels of perceived security and stability of the relationship and self-perceived feelings of attractiveness and acceptability to partners (Bush, Bush & Jennings, 1988). It also seems to elicit emotions such as decreased joy and an increase in negative emotions, and it also intensifies feelings of surprise, fear and distress (Bush, 1988). Mathes, Adams & Davies (1985) found that loss of a romantic partner to a rival results in loss of relationship rewards

and loss of self-esteem. In the jealousy-scale, there are some extremities, one of those are Jealousy is thus an important part of human emotions.

Evolutionary theory

Darwin (1859; 1871), the pioneer within the evolutionary theory, used the term sexual selection to deal with the evolution of mating. He described two processes within sexual selection; *Intrasexual Competition* and *Intersexual Selection*. In *Intrasexual Competition*, members of one sex competed with each other to get sexual access to the other sex (e.g. two stags locking horns in combat, where the victors gain sexual access to females, while the losers fail to mate). *Intersexual Selection* is a process that involves desired qualities in mate choice, and chooses a mate that possesses good qualities (e.g. Peacock's colorful and big feathers, the one with the biggest and most colorful feathers are most attractive as mate). The term *Parental Investment* by Trivers (1972) branched from Darwin's Sexual Selection. In species where one sex invests considerably more than the other, members of the low-investment sex will compete among themselves to mate with members of the high-investment sex (Trivers, 1972). In other words, the sex who has greater parental investment will become a limiting resource for the opposite sex, while the sex having less parental investment will compete among themselves to breed with members of the high-investing sex. We then understand the pattern of nature; an individual who has low parental investment can increase its reproductive success by investing successively in the offspring of several members of the limiting sex. If the male invests more than one-half of what the female invests, then selection may not favor male competition to pair with more than one female (Trivers, 1972). As male risks paternal uncertainty, females risk loss of time, resources and commitment from their partner if he leaves her for the benefit of another woman (Buss, 1988; Trivers, 1972). For the Pleistocene woman it was important that she felt safe with her partner. She had to be sure that her mate had good genes and that he was willing to support both her and a future baby. Trivers (1972) speak of parental investment as any investment in the offspring by the parents that increases the offspring's chances of surviving.

To produce a child, a woman invests nine months of her life before she gives birth. Women thus invest more than their mates and face more risks during this phase. While the nine months pass, the woman cannot get pregnant, while a man can theoretically produce several offspring every day. Also, there can be complications during pregnancy or birth, e.g. cardiovascular conditions, infections and thrombotic pulmonary embolism (Berg, Callaghan,

Syverson, Henderson, 2010). It is also the women that breast-feed, and thus the women use more time both during their pregnancies and the first year after birth. The women are in a sense programmed to look for a lifelong partner who is willing to protect and invest in them and their offspring, and they desire a mate who has good financial prospects and elevated social status (Buss, 2007). This ensures survival for the women and their offspring, thus the child is growing up to be a healthy adult that can find him- or herself a mate and reproduce. This is a lifelong chain, made by generations of successful women and men. Women would hence select mates who are willing to commit time and who are able to provide resources and protection to the family (Buss, 1989).

Our female ancestors faced a multitude of adaptive problems, gathering food, to pick the right mate, attracting mates, caring for kin and further on. These challenges required different skills, and evolutionary psychologists argue that these mechanisms are well anchored in us (Buss & Schmit, 1993). Even though the present women live under completely different circumstances than the Pleistocene women, it is fair to assume that these psychological adaptations are well anchored in us because it was important for the survival of our species. Studies have been conducted to look at differences and similarities between the two sexes, and Buss and Schmit (1993) found that commitment was important for both men and women, and for women, the importance of investment was high. The meta-analysis of sex differences in the contemporary North American literature on mate selection preferences support the prediction that women, more often than men, seek characteristics in a partner that will maximize the survival prospects of their offspring (Feingold, 1992). Women are more focused than men on characteristics like socioeconomic status, ambitiousness, character, and intelligence. Feingold (1992) found that these findings were invariant across generations, cultures and research paradigms.

Menstrual cycle

The menstrual cycle is perhaps the most easily recognized biological rhythm in human beings. There are three main phases in the menstrual cycle; Menstrual bleeding phase, The Estrogen phase and the Progesterone phase (Mtwali, Pina, Angle & Murphy, 1997).

In the Menstrual bleeding phase (days 1 to 5), hormone levels are at their lowest point. The second phase is the Estrogen phase (days 6-14), where the levels of estrogen rises to a peak at day 14. This phase is known to be more variable in length than the other phases (Mtwali et al., 1997). In menstrual cycle, the hormone Estrogen plays a vital role in

fertilization, as it makes the cervical mucus stretchy and slippery for sperm to pass easily (ovulation). During pregnancy, Estrogen initiates the growth and the development of the uterus (Mtwali et al., 1997). It is in between the estrogen phase and in the beginning of progesterone phase that ovulation occurs, about 12 to 16 days before the beginning of the next menses. After the few days with ovulation, the third phase (Progesterone phase) begins, starting at day 15 and lasts to day 28. When the mature ovum has been released from the dominant ovarian follicle, it secretes progesterone. Together, progesterone and estrogen further develop the endometrium and prepare for a possible pregnancy. If pregnancy occurs, than high levels of progesterone will sustain pregnancy by balancing the estrogen stimulation (Mtwali et al., 1997). During late pregnancy, a decline of progesterone causes contractions which results in labour, while a decrease of progesterone through menstrual cycle causes menstrual bleeding. The progesterone phase is more stable than the Estrogen phase, as it does not vary much from month to month or from woman to woman (Mtwali et al., 1997). In the progesterone phase the body produces progesterone and estrogen because of the high level of LH; then if one has not been fertilized, the production of LH reduces followed by a reduction of estrogen and progesterone, and hence the menstruation starts (Mtawali et al., 1997). The two mentioned hormones, Estrogen and Progesterone, are thus necessary to sustain a healthy pregnancy (Mtwali et al., 1997).

It has been found that subjective sexuality, independent of mood change, is maximal in the mid follicular (postmenstrual) and late luteal (premenstrual) phase, thus the negative mood changes in women with premenstrual syndrome are closely linked to the luteal phase of the hormonal cycle and reach their maximum during the last five days of the luteal phase (Backstrom, Sanders, Leask, Davidson, Warner & Bancroft 1983). Backstrom et al. (1983) found that the positive moods were at their maximum when the estradiol reached its peak before ovulation.

There seems to be a link between women`s menstrual cycle with its hormonal effects and their behavior; for example, women seem to dress more attractively when near ovulation (Haselton, Mortezaie, Pillsworth, Bleske, & Frederick (2007), which may be a part of the evolution. Also, a study conducted by Fisher (2004), found evidence that women in high oestrogen phase, when they are most fertile, increase their competition towards other females. Kessel & Coppen (1963) did a study on menstrual cycle and women`s health, and found a high frequency of symptoms in the premenstruum, and that the mood change was found to be of a moderate to severe degree (Kessel and Coppen, 1963). Mood change has also been found in other studies where irritability and swelling of the abdomen were reported as the most

common symptoms (Andersch, Wendestam, Hahn & Øhman, 1985).

Effects in brain regions due to hormonal variations seems to lead to emotional changes, as the menstrual cycle is found to have an effect on the orbitofrontal cortex [OFC] (Protopopescu, Pan, Altemus, Tuescher, Polanecsky, McEwen, Silbersweig, and Stern, 2005). OFC has been implicated in the representation of emotional stimuli, assignment of emotional valence salience to stimuli, stimulus-reinforcement association learning, motivation, and socio-emotional control. Protopopescu et al. (2005) used fMRI in female subjects without premenstrual mood symptoms where they were shown emotional linguistic stimuli, and found that OFC activity varied depending on the menstrual cycle phase. Specifically, anterior-medial OFC activity for negative vs. neutral or positive linguistic stimuli was increased premenstrually and decreased postmenstrually (Protopopescu et al., 2005).

Moos, Kopell, Melges, Yalom, Lunde, Clayton & Hamburg (1968) tested the average self-rated anxiety and aggression for 15 women who were not using contraceptives. Anxiety was high during the menstrual phase, decreased rapidly, began to show a slight rise around mid-cycle, and continued to rise quite consistently until the 26th day. Anxiety then showed a slight decrease on the 28th day. Aggression was also high during the menstrual phase, and showed a decrease until mid-cycle. At day 18 it showed a rapid increase and a subsequent slow but steady fall until the end of the cycle. Thus, self-rated aggression was highest during the menstrual and postovulatory phases; however, premenstrual aggression was reliably higher than aggression at mid-cycle. They also found that high premenstrual tension women rated themselves as lower in sexual arousal in the menstrual and premenstrual phase, and Moos et al. (1968) suggest that all this may have an effect on family coping and adaptation patterns, which leads us back to the present research. Further on, it has been found that cycle phase also have an influence on jealousy, that is when they are at their most fertile (; Cobey et al., 2012). In an evolutionary perspective, when a woman is fertile, it would be very important for her to keep her partner.

Synthetic cycle versus natural cycle

Hormonal contraceptives contain synthetic progesterone (Levonorgestrel) and estrogen (ethinylestradiol) (As stated in the homepage www.legemiddelverket.no). The effects of hormonal changes have been subject to high curiosity among researchers, and many studies have been conducted (e.g. Gangestad et al., 2002; Cobey et al., 2010; Cobey et al., 2012; Haselton et al., 2007; Andersch et al., 1985 Kessel et al., 1963).

One of the earlier studies, conducted by Grant & Pryse-Davies (1968), found that the use of oral contraceptives with strongly progestogenic compounds, especially those containing a small amount of estrogen, lead to side-effects such as depression and loss of libido, which have high monoamine oxidase activity through the cycle. The lowest incidence was found with the strongly estrogenic sequential regimens which have weak monoamine oxidase activity through cycle (Grant & Pryse-Davies, 1968). Meyer, Ginovart, Boovariwala, Segrati, Hussey, Garcia, Young, Praschak-Rieder, Wilson & Houle (2006) documented a 34% elevation in Monoamine Oxidase A (MAO-A) activity in the brain during major depressions. Looking at the findings in the studies conducted by Grant et al, (1968) and Meyer et al. (2006), they demonstrate the connection between emotions and our brain`s sensitivity towards hormonal influences. Previous research suggests that female jealousy is sensitive to hormonal variation and, more specifically, potentially moderated by estrogen levels (Geary et al., 2001; Cobey et al., 2010; Cobey et al., 2012). Studies conducted by (DeSoto, Geary, Hoard, Sheldon & Cooper, 2003) suggest that fluctuation in estrogen level may influence the expression of borderline personality disorder symptoms, as these symptoms were most common in women using oral contraceptives and during times in the menstrual cycle when estrogen level is rising. Women who were using Oral Contraceptives showed significantly higher levels of borderline symptoms than did women not using hormones and menstruating normally (DeSoto et al., 2003). In more simplified words; significant changes in hormone levels can affect the level of neurotransmitters, or brain chemicals, that regulate mood.

It has also been found that when using hormone-based contraceptives, women tended more towards sexual jealousy than females who were not using hormones, and reported more intense affective responses to partner infidelity (Geary, DeSoto, Hoard, Sheldon & Cooper, 2001). Women using hormone-based birth control reported more intense hurt feelings for imagined emotional infidelity and sexual infidelity. It has also been found that if women are naturally cycling, their jealousy-feeling intensifies during the time of high fertility risk (Geary et al., 2001). Paige (1971) found that women with natural menstrual cycles showed more variability of negative affect (e.g. anxiety), while women using combination oral contraceptives showed no cycling affective changes. By analyzing this further, she suggests that the absence of affective fluctuations among users of drug combinations may be due to both the effects of the drug on the intensity of menstrual flow, and to its effects on MAO activity (Paige, 1971). Also, a study conducted by (Oinonen & Mazmanian, 2002) found that users of Oral Contraceptives experienced less variability in affect across the menstrual cycle, compared to non-users.

Fertility status and Mate-Value

Women show higher levels of in-pair sexual desire during high conception probability compared to low conception probability (Pillsworth, Haselton & Buss, 2004), indicating the importance of relationship-stability in the perspective of reproduction and parental investment. However, conflicting findings suggest that women show greater sexual interest in, and fantasy about, non-primary partners near ovulation than during the luteal phase, and not about their primary partners. At the same time, women closer to ovulation reported that their primary partners were both more attentive and more proprietary (Gangestad, Thornhill & Garver, 2002). The critical window for a man's paternity probability is near ovulation, thus, at that time men increase their jealous mate-guarding. When women are in their most fertile phase in the menstrual cycle, they seem to appreciate properties that one usually associates with short-time relationship, e.g. physical attractiveness, and being social (Gangestad, Garver-Apgar, Simpson & Cousins, 2007).

It has been found that a partner's sexual attractiveness can moderate the effect of fertility status on extra-pair desires, suggesting that women who perceive their partners as low in sexual attractiveness are particularly likely to report an increase of interest in other men at high fertility (Pillsworth & Haselton, 2006). Also, women who report less relationship satisfaction or are mated with less attractive partners are less interested in their primary relationship (Chen, 2005).

All things considered, the romantic relationship between two adult human beings seems to be very complex, suggesting influences by many factors.

The aim of this study

This study will focus on how hormones can impact women's interpretations and negative emotions of conflicts in relationships. Since the hormones Estrogen and Progesterone are related to sustaining a pregnancy (Mtwali et al., 1997), we expect the women who use Hormonal Contraceptives to score higher on jealousy and on conflicts in general, compared to naturally cycling women, because of the higher pregnancy-related hormone-levels in their bodies. Our assumptions are based on previous studies suggesting an influence by use of Hormonal Contraceptives (Paige, 1971; Geary et al., 2001; Cobey et al., 2010).

We also intend to investigate the effect of menstrual cycle, as it has been found that

cycle phase would influence on jealousy, (Geary et al., 2001; Cobey et al., 2012), and hence we expect to find that naturally cycling women would show a fluctuation throughout the menstrual cycle in their responses to conflicts, while women using hormonal contraceptives would show more stability, which makes naturally cycling women more affected by fertility status. Since women seem to report stronger levels of jealousy (Cobey et al., 2012), and taking more initiative to sex with primary partner (Gangestad et al., 2002) when fertile, there are conflicting findings of women`s interest in their current partner vs. interest in other partners, when fertile (Cobey et al., 2012; Geary et al., 2001; Gangestad et al., 2002; Chen, 2005; Pillsworth, Haselton & Buss, 2004), and since findings suggest that women appreciate properties that one usually associates with short-time relationships (e.g. physical attractiveness) when fertile (Gangestad, 2007), there seems to be a link between women`s desire for attractive mates and their partner`s physical attractiveness. These conflicting finding seems noteworthy, and will therefore be investigated further in this study, however, not as a replication. Since women seem to be interested in traits represented by physical attractiveness, we expect that women who are already partnered with an attractive man will be more proprietary towards their partner, and hence respond with emotional distress to conflicts in relationship, especially when fertile. Our study will investigate whether perceived partner-attractiveness influences women`s emotional responses to conflicts when fertile, that is, if a woman is partnered with a man she perceives as physically attractive, she is expected to feel more commitment to the relationship, and hence respond with stronger emotional distress to conflicts and jealousy-provoking scenarios when fertile. We use a between-subject design to test how jealousy and conflicts vary, first as influenced of HC-use, and secondly as a function of fertility status and partner`s sexual attractiveness. The next section of this thesis will outline four hypotheses.

Hypotheses

Previous studies have found an influence by usage of Hormonal Contraceptives (Paige, 1971; Geary et al., 2001; Cobey et al., 2010, Cobey et al., 2012), and we thus expect that women using hormonal contraceptives will score higher on jealousy and on conflicts in general, compared to naturally cycling women. Two predictions were made regarding the use of Hormonal Contraceptives. The two hypotheses are two-tailed.

H1 "Women who use Hormonal Contraceptives will, compared to Naturally cycling women, become emotionally distressed by situations which indicate infidelity."

H2. Women using Hormonal Contraceptives will report more emotional distress over coupleconflicts in the relationship, compared to naturally cycling women”

Both Paige (1971) and Oinonen & Mazmanian (2002) found that women using Oral Contraceptives (which in our study are referred to as HC) showed more stability and less variability through their menstrual cycle compared to non-users. Also, previous research (Fisher, 2004) has shown that naturally cycling women, around ovulation, increase their competition towards other women. Cobey et al. (2012) also found that for partnered women who were using hormonal contraceptives, levels of jealousy did not differ when using the pill vs. being fertile. In our third prediction, we expect to find that naturally cycling women would be affected by fertility status in their responses to conflicts. Thus, we expect that naturally cycling women will be more jealous around ovulation.

H3. Given that women are naturally cycling, their jealousy level will increase when they are fertile.”

The intriguing conflicting findings of women`s interest in their current partner vs. interest in other than their primary partner, when fertile (Cobey et al., 2012; Geary et al., 2001; Gangestad et al., 2002; Chen, 2005; Pillsworth, Haselton & Buss, 2004), have helped me shape the fourth and fifth prediction. Since women seem to report stronger levels of jealousy (Cobey et al., 2012) when fertile, and take more initiative to sex with primary partner (Gangestad et al., 2002), and appreciate properties that one usually associates with short-time relationship (e.g. physical attractiveness) when fertile (Gangestad, 2007), we expect to see interactions between fertility status, partners` sexual attractiveness on women`s emotional distress towards scenarios indicating infidelity, if they are naturally cycling. We expect this because the partners who are perceived as attractive most likely will be attractive for other women as well, and hence call for stronger emotional distress for the women mated with these attractive partners when they are most likely to conceive. We also want to look whether this also applies for the overall conflicts. Thus, our fourth and fifth predictions are:

H4 “Partner`s attractiveness will influence the association between women`s cycle phase and women`s jealousy.

H5 “Partner`s attractiveness will influence the association between women`s cycle phase and women`s emotional response to couple-conflicts.

Method

Participants

Participants were recruited from the Norwegian Technical University in Trondheim. There were 222 participants that entered the first questionnaire and these were currently in a relationship and aged between 18 and 30 years ($M = 23.08$, $SD = 2.47$). The average relationship lengths were 34.71 months ($SD = 28.06$). Of the 222 women, 172 women answered the questions regarding use of hormonal contraception and responded the conflict scenarios. 118 (75.0%) were currently using hormonal contraceptives while 54 (25.0%) were not.

Instruments

Weekly questionnaires. The present study consisted of 12 measures, using computer-based questionnaires weekly over 12 weeks, with Select Survey as a database for our questionnaires. The questionnaire was approved by the independent Research Ethics Committee (REK), as it consisted of rather personal questions like length of menstrual cycle, sexual activity during the last few days, and use of hormonal contraceptives.

Fertility estimation. The onset and duration of the menstrual cycle was reported by the participants. This was done mainly because other studies have used this method with success (e.g. Haselton and Gangestad, 2006). From the participants we obtained the start date of their last menstrual period, the previous menstrual period, the expected start date of their next menstrual period, the typical length of their menstrual cycle. We also included questions about cycle variability, as suggested by Small, Manatinga & Marcus (2007). We then used the established reverse cycle day method (RCD) to predict the fertile period for each participant (DeBruine et al., 2005; Haselton et al., 2006). We chose to use the counting backwards calculation because the last part of the cycle is found to be more stable than the first part, and thus a more reliable indicator of ovulation (Hatcher, Trussel, Nelson, Cates, Stewart, Kowal 2007). We calculated conception probability on each day of the menstrual cycle for each person to get a within-subject design.

Demographic variables. The first questionnaire contained several demographic questions which asked participants about their sex, age, whether they were in a relationship, the length of their relationship (in months), whether they were pregnant or not, and whether

they were using hormone-based birth-prevention.

Dependent Variables. The vignettes were made by the author in cooperation with Grøntvedt. Before we started collecting data for the study, we did a pilot-study to decide which of the 25 vignettes we were going to include in the questionnaire. We gathered answers from 12 women because they were to show variance without the intention that it would upset everybody at any time (e.g. “I saw my partner kiss another woman”). Since the study was intended to investigate changes with regard to several different aspects of potential conflicts in relationships, the vignettes needed to show variance in order to be measures in level of conflicts. We found a good variance, leaving us with 19 situational descriptions that had the potential to be interpreted as conflicts. In the current study, the participants were asked the following question before answering the vignettes: “Think about your current relationship. How upset would you be if this happened?” (See Appendix A for the 19 Vignettes). The vignettes were to be answered on a scale from 1-100 percent on how upset they would be if these situations would occur. The vignettes were in a randomized order for each questionnaire.

Mate Value Inventory. Participants also answered on MVI-7 questions (Kirsner, Figueredo & Jacobs, 2003). We used two versions of MVI-7, one which had questions about the participant herself, consisting of 17 descriptives (MVI-7_S), and one which was asking about the participant’s partner, consisting of 19 descriptives (MVI-7_P). The questions were the same as the one used in Kirsner et al. (2003) study, the only difference was that we translated the questions into Norwegian. The MVI-7_S was not included in the current study as the hypotheses involved only MVI-7_P. Thus MVI-7_P was included in the current study because we believe that how the women perceive their partner’s reflects the relationship satisfaction, and relationship satisfaction is found to have an influence on the degree of interest in primary relationship (Chen, 2005). The participants were asked “Describe your current partner as well as possible by marking on the scale of 1 to 7 for each of the 19 adjectives/statements below”, and were given a seven point Likert-type scale to provide their answer (one being “Doesn’t describe him at all”, seven being “Describes him perfectly”). High scores indicate higher mate-value.

Procedure

Women were recruited via a stand at Dragvoll and Gløshaugen campus at The Norwegian University of Science and Technology and word of mouth. The women were informed that

there were no financial benefits for participating in the study.

The participants completed the online questionnaires on their personal computer. Criteria for participant exclusion included those who were men, single, under 18 or over 30 years, pregnant, and extreme long menstrual cycles or very variable menstrual cycles. Before the participants could enter the web-based questionnaire, they were first asked these demographic questions (e.g. gender, age and relationship status). If they were in the target group, they were allowed to take part in the study. After answering the first questionnaire, the participants received a weekly reminder email.

Statistics

Statistical analysis was performed with IBM SPSS 20.0 for Windows. To test predictions for HC-users and non-users, we conducted Independent t-tests to look at difference in mean scores on each of the vignettes and the grouped vignettes.

Working with data. All code-duplicates were discovered and removed, and the menstruation dates were organized. Missing values for days in the menstrual cycle were calculated using the expected date of next onset and length of cycle. This was done just for the calculations of days in the same cycle as cycle length could potentially vary considerably. Further we created variables that indicated which phase the women were in at the time they were responding, based on a 28-day cycle.

We chose to merge the two categories “No, but I have used hormonal contraceptives within the last three months” together with “No, I am not using” into one category (“non-users”) because previous research has shown that hormone levels return to baseline shortly after women stop taking Hormonal Contraceptives; only a few days after stopping HC intake, ovarian function is already restored (Duijkers, Engels, & Klipping, 2005). We excluded women who were jumping between “Yes, I am using” and “No, but I have used within the last three months” and “No, I have not used within the last three months” throughout the 12 questionnaires. We thus had two groups of women: HC-users and non-users.

To test the predictions for the effect of menstrual cycle, we conducted repeated measures general linear models (GLM) on the dependent variables of interest (e.g. contraception use, Jealousy, Commitment, Emotional support and Time & Effort) where each participant with their fertility status was a repeated factor.

Results

To assess the dimensionality of conflict-responses, items were submitted to an exploratory principal-axis factor analysis with a direct oblimin rotation. Four factors emerged with Eigenvalues greater than one. Examining the pattern matrix, we found groups of items that interrelated with one another. Factor 1 included 5 items which asked participants how upset they would be in situations linked to infidelity, (e.g. “Your partner has a new female coworker who he says is very attractive and he boosts her skills”). Factor 1 had an Eigenvalue on 5.62 and accounted for 29.58% of the variance and demonstrated high internal consistency score with Cronbach’s $\alpha = .87$. Factor 2 included 5 items regarding partners’ emotional support (e.g. “You have experienced something emotionally unpleasant and want to talk about it, he rejects you”). It had an Eigenvalue on 2.73, and accounted for 14.35% of the variance and demonstrated an internal consistency score with Cronbach’s $\alpha = .74$. Factor 3 accounted for 9.03% of the variance, with high internal consistency (Cronbach’s $\alpha = .82$), and consisted of 6 items (e.g. “You’re having visitors and have to clean and cook, but he doesn’t want to help as he thinks it looks ok”). The Eigenvalue was 1.71. The fourth Factor had an Eigenvalue on 1.48, accounting for 7.77% of the variance. This factor consisted of 3 items (e.g. “You want to buy/rent an apartment together, but he says he is not ready for that yet”) and demonstrated a consistency score with Cronbach’s $\alpha = .66$. The four groups were categorized as (I) *Jealousy*, (II) *Emotional Support*, (III) *Time & Effort* and (IV) *Commitment*. (See Appendix.B for Table with Factor Loadings).

For the Mate-value Inventory, a principal-axis factor analysis was applied for further investigation. We examined five, four and three factor solutions and a three factor solution yielded the most consistent pattern of loadings, all with Eigenvalues over one. Factor 1 had a Cronbach’s $\alpha = .70$, included 7 items (e.g. “Intelligent”, “Independent”), and accounted for 23.19% of the variance. Factor 2 accounted for 10.12% of the variance with a Cronbach’s $\alpha = .68$, and included 8 items (e.g. “Shares my values”). The third factor, accounting for 8.22% of the variance, consisted of 3 items (e.g. “Attractive body”) with Cronbach’s $\alpha = .65$.

We set an absolute value below .30, hence the item *Sociable* was the only item excluded. Since values as low as $\alpha = .6$ can be acceptable (Lindmeier, 2011), we accepted the factors extracted. The main factors were thus named *Intelligent* (Ambitious, Financially secure, Healthy, Independent, Intelligent, Responsible and Emotionally stable), *Agreeable* (Desires children, Faithful to partner, Generous, Good sense of humor, Kind and

understanding, Loyal, Shares my values and Shares my interests), and *Sexually attractive* (Attractive body, Attractive face and Enthusiastic about sex). (See Appendix D for table with Factor Loadings). We thus have three factors describing partner's mate-value.

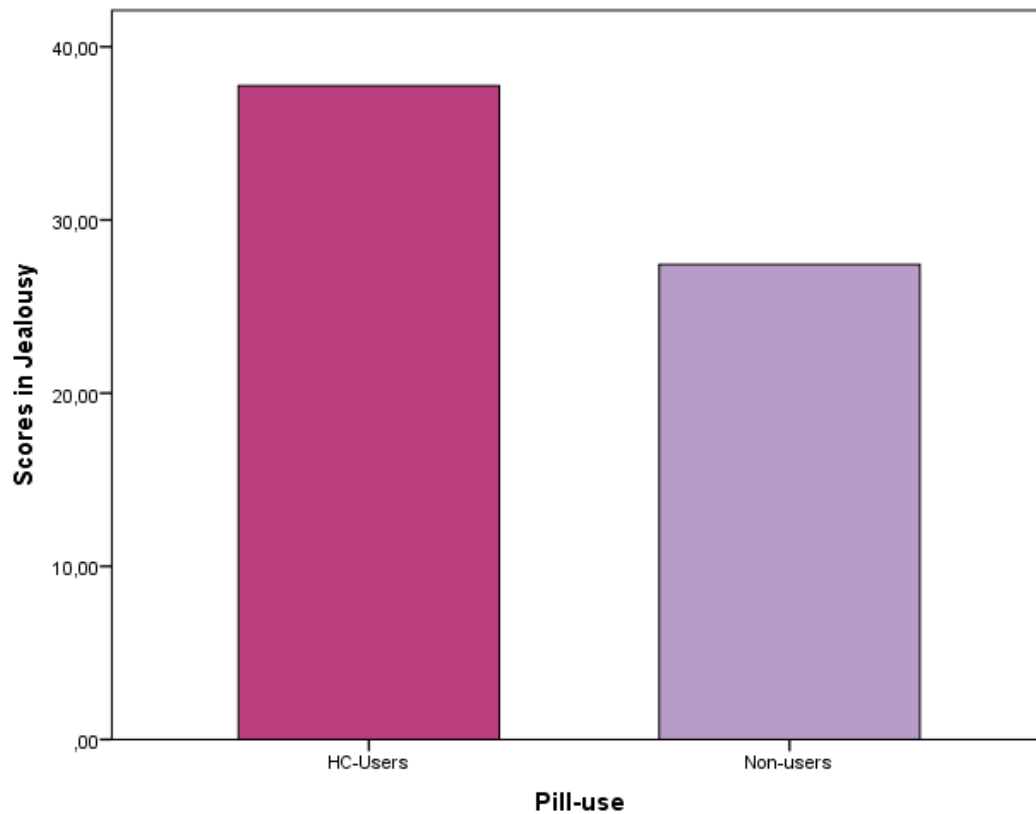
Testing the hypotheses

The current study examined women's emotional response to conflict-scenarios, especially jealousy-provoking situations. It has been suggested to use a two-tailed test even if one has predicted directional hypotheses (Hayes, 2012). The analysis of hormonal impact on Jealousy and conflicts in general, as a consequence of Hormonal Contraceptives, were conducted with an Independent t-test, a two-tailed for all hypotheses. An alpha level of .05, was used for the independent t-tests. For the hypotheses concerning interactions and effects of fertility status, partner's attractiveness and natural cycle vs. pill-use, one analysis for each of the conflict-groups (e.g. Jealousy, emotional support, Time and Effort and Commitment) were run with all interactions and variables on GLM repeated measures. For this analysis the alpha level were cut to .001. The Between-subject factor was whether they were naturally cycling (naturally cycling versus pill-use), while the covariate was the zero-centered within-subject factor, fertility status (the day when they are most fertile). The dependent variables were the vignettes (the four conflict-subgroups; Jealousy, Emotional Support, Time & Effort and Commitment, and the overall conflicts). There were three predictor variables: Partner's intelligence, partner's agreeableness and partner's sexual attractiveness.

Hypotheses 1: Do women who are using Hormonal Contraceptives respond higher on emotional distress on Jealousy, compared to naturally cycling women?

As predicted, there was a difference between the two groups on Jealousy $t(170) = 3.11$, $p = 0.002$. Women who use Hormonal Contraceptives report more emotional distress to the jealousy-provoking scenarios. See figure 1.

Figure 1. Mean difference on Jealousy for HC-users and non-users (Naturally cycling women).



Do HC-users report more emotional distress over conflicts in the relationship?

Although women using hormonal contraceptives ($M = 48.03$, $SD = 13.15$) got slightly more upset than naturally cycling women ($M = 45.33$, $SD = 13.74$), the difference was not significant $t(170) = 1.23$, $p = .219$. We looked at all the single vignettes and the grouped vignettes (see table 1.).

Table 1. Mean scores and Standard Deviations with t-test (two-tailed for jealousy and for the other conflicts) results on the conflict-situations for HC-users and non-users

Table 1					
<i>T-test on the 19 vignettes</i>					
<i>Item</i>	HC-users (N=118)		Non-users (N=54)		<i>Results</i>
	Mean	Sd.	Mean	Sd.	
Phone calls	47.52	26.86	40.12	29.22	$t(170) = 1.63, p = .105$
SMS	30.66	21.62	21.21	21.07	$t(170) = 2.68, p = .008 *$
Looking at butt	33.41	25.04	22.58	24.05	$t(170) = 2.66, p = .008 *$
Female Coworker	51.81	26.87	40.85	26.87	$t(170) = 2.48, p = .014 *$
Facebook	25.39	22.82	12.41	16.69	$t(137) = 4.19, p = .000 *$
Jealousy	37.76	20.63	27.43	19.2	$t(170) = 3.11, p = 0.002 *$
Emotionally Unpleasant	76.72	18.02	79.21	18.09	$t(170) = -.840, p = .402$
Uninterested in talk	73.38	18.46	75.99	18.05	$t(170) = -.866, p = .388$
Stressed about work	70.43	19.40	76.43	16.44	$t(170) = -1.97, p = .050*$
Too much time with friends	53.31	19.74	49.66	25.12	$t(170) = 1.03, p = .304$
Packages, says you are wasting	58.91	21.06	59.84	22.95	$t(170) = -.263, p = .793$
Emotional Support	66.55	15.82	68.23	13.24	$t(170) = -.677, p = .499$
Camping	51.74	20.82	50.58	26.13	$t(83) = .172, p = .864$
Forgetting	57.93	19.50	61.83	22.35	$t(170) = -1.16, p = .247$
Refuses to clean house	29.93	21.80	28.84	23.41	$t(170) = .297, p = .767$
Much time on computer	40.53	24.54	37.54	26.41	$t(170) = .724, p = .470$
Rather play videogames	56.06	22.77	54.61	25.87	$t(170) = .370, p = .712$
Visitors, does not clean or cook	53.83	21.20	61.26	21.19	$t(170) = -2.13, p = .034 *$
Time&Effort	48.23	16.56	49.08	18.53	$t(170) = -.301, p = .764$
Buy/rent apartment together	42.03	24.20	38.94	32.49	$t(81) = .622, p = .535$
Dining out, special occasion	29.83	20.85	21.02	18.62	$t(170) = 2.66, p = .009 *$
Not interested in children	29.82	23.96	28.51	30.13	$t(170) = .305, p = .761$
Commitment	33.89	18.25	29.49	23.60	$t(83) = 1.21, p = .228$
CONFLICTS in total	48.03	13.15	45.33	13.74	$t(170) = 1.23, p = .219$

*<0.05

If women are naturally cycling, does fertility status make women more jealous?

Even if it was a very small increase in naturally cycling women's jealousy around ovulation, there were no significant interaction between natural cycle \times fertility status $F(1,437.76) = .059, p = .808$. Natural cycle \times partner's intelligence interaction showed a non-robust but interesting finding, $F(1,93.39) = 2.798, p = .098$; Given that women are naturally cycling, they are more jealous if they perceive their partner as intelligent.

An additional analysis for overall conflicts with natural cycle, fertility status and partner's attractiveness interactions was conducted. There was no interaction between natural cycle \times fertility status $F(1,438.75) = .864, p = .353$ on the overall conflicts.

Does partner's attractiveness affect the association between natural cycle, fertility status and jealousy?

Since the factor analysis yielded three dimensions within partner's attractiveness (e.g. intelligence, agreeableness and sexually attractive), these three dimensions were used in the analysis. The natural cycle \times fertility status \times partner's sexual attractiveness interaction was not significant, $F(1,449.24) = .178, p = .673$. The interaction natural cycle \times fertility status \times partner's agreeableness was also non-significant, $F(1,445.71) = 1.874, p = .172$. And no interaction for natural cycle \times fertility status \times partner's intelligence, $F(1,432.14) = .626, p = .429$.

In the analysis on *Jealousy*, partner's sexual attractiveness had a non-robust effect, $F(1,101.63) = 4.119, p = .045$. This may imply a tendency where women with more sexually attractive partners are more jealous overall. Also, there was a non-robust main effect of Partner's agreeableness, $F(1, 101.02) = 3.456, p = .066$. The fertility status \times partner's sexual attractiveness interaction was not significant, $F(1, 449.24) = 0.422, p = .516$. Fertility status \times partner's agreeableness interaction was not significant, $F(1, 445.71) = .314, p = .576$. Partner's intelligence showed no main effect, $F(1, 93.39) = 2.58, p = .111$, and fertility status \times partner's intelligence did not significantly interact, $F(1, 432.14) = 2.15, p = .143$.

Does partner's attractiveness affect the association between natural cycle, fertility status and women's emotional response to conflicts?

We examined the three-way interactions and natural cycle \times fertility status \times partner's sexually attractiveness interaction was non-significant $F(1,450.72) = .048, p = .827$, so was natural cycle \times fertility status \times partner's agreeableness, $F(1,447.05) = .547, p = .460$, and

natural cycle \times fertility status \times partner's intelligence $F(1,432.84) = .053, p = .818$. However, we found a non-robust main effect of partner's sexual attractiveness $F(1,102.18) = 5.64, p = .019$; which could imply a tendency among women who perceives their partner as sexually attractive, making them perceive the overall conflicts as upsetting. No interaction between fertility status \times partner's sexual attractiveness were found $F(1,450.72) = .048, p = .827$. A non-robust effect of Partner's agreeableness were found, $F(1,101.53) = 3.16, p = .078$, but it was no significant interaction between fertility status \times partner's agreeableness, $F(1,447.05) = .254, p = .614$.

Partner's intelligence had no main effect, $F(1,93.44) = 1.99, p = .162$, however, it seemed to non-significantly interact with fertility status $F(1,432.84) = 4.04, p = .045$. Thus, there seem to be a tendency that when fertile and mated with a partner they perceive as intelligent, they report to be more distressed for overall conflicts.

We also investigated the three remaining subfactors of conflicts, and hence separate analyses were performed for Emotional support, Time&Effort and Commitment. All three dimensions within partner's attractiveness were also used here, as in the previous analysis.

In the analysis on *Emotional support*, there were no main effect for partner's sexually attractiveness, $F(1,106.40) = .680, p = .412$, nor was it a fertility status \times partner's sexually attractiveness interaction, $F(1,465.08) = .599, p = .439$. Natural cycle \times fertility status \times partner's sexually attractiveness interaction was not significant either, $F(1,465.07) = .424, p = .515$. Partner's agreeableness showed no main effect $F(1,105.08) = .047, p = .830$, and no fertility status \times partner's agreeableness interaction, $F(1,460.14) = .382, p = .537$. Natural cycle \times fertility status \times partner's sexually agreeableness interaction was non-significant, $F(1,460.14) = .007, p = .933$. The same for partners intelligence $F(1,91.64) = .017, p = .898$, fertility status \times partner's intelligence interaction $F(1,460.14) = .382, p = .537$, and natural cycle \times fertility status \times partner's intelligence interaction, $F(1,439.04) = .948, p = .331$.

In the analysis on *Time&Effort*, partner's sexual attractiveness showed no main effect, $F(1,103.67) = 1.064, p = .305$. Fertility status \times partner's sexual attractiveness interaction was not significant either, $F(1,456.52) = .051, p = .822$, nor was natural cycle \times fertility status \times partner's sexual attractiveness interaction, $F(1,456.52) = .122, p = .727$.

Partner's agreeableness showed no main effect, $F(1,102.78) = .462, p = .498$, nor did fertility status \times partner's agreeableness, $F(1,452.26) = .038, p = .845$. Natural cycle \times fertility status \times partner's agreeableness interaction were not significant $F(1,452.26) = .004, p = .951$.

There was a non-robust main effect of Partner's intelligence, however not significantly so, $F(1,92.62) = 3.094, p = .082$, and no significant interaction for fertility status \times partner's

intelligence, $F(1,435.14) = .738, p = .391$. Natural cycle \times fertility status \times partner's intelligence interaction was non-significant, $F(1,435.14) = .495, p = .482$.

In the analysis on *Commitment*, partner's sexual attractiveness had a non-robust main effect, $F(1,102.70) = 4.962, p = .028$. Which could imply a tendency for women with more sexually attractive partners to respond with stronger emotional distress on scenarios which indicates partner's lack of commitment. The natural cycle \times fertility status \times partner's sexual attractiveness interaction was not significant, $F(1, 457.23) = .373, p = .542$. There was a non-robust main effect of Partner's agreeableness, $F(1, 101.75) = 3.679, p = .058$, as was fertility status \times partner's agreeableness interaction, $F(1, 452.75) = 3.117, p = .078$. However, the natural cycle \times fertility status \times partner's agreeableness interaction was non-significant, $F(1, 452.75) = .133, p = .715$. Partner's intelligence did not have a main effect, $F(1, 91.09) = .078, p = .781$, nor fertility status \times intelligence interaction, $F(1, 434.60) = 1.772, p = .184$, and not natural cycle \times fertility status \times partner's intelligence, $F(1, 434.60) = .129, p = .719$.

Discussion

Women's reproductive biology has imposed heavy obligatory costs of parental investment. With hormonal variations and fleetingly brief periods of maximal fertility within a woman's cycle, the expression of a woman's mating adaptations may be sensitive to her fertility status. Research has documented cyclical effects in behavior and preferences (e.g., Haselton et al., 2006; Cobey, et al., 2012;) where for example women take more initiative to sex with primary partner (Gangestad et al., 2002), and appreciate properties associated with short-time relationship (e.g. physical attractiveness) when fertile (Gangestad, 2007). This study investigated women's emotional response to conflicts by looking at factors that, from an evolutionary perspective, could have an influence on their perception of jealousy-provoking situations and conflicts in general. The investigation included factors such as pill-use, natural cycle, fertility status and partner's attractiveness, and provided evidence for the impact of pill-use. However, this study did not support the hypotheses about fertility status' impact on women's emotional response to conflicts and heightened levels of jealousy, nor did it yield any significant interaction between natural cycle, fertility status and partner's attractiveness. However, we did find some evidence for influences of fertility status and partner's attractiveness interactions on the conflicts. This research is the first to look at couple conflicts in the light of evolutionary theory and hormonal influences.

The influence of synthetic hormones on jealousy

Concerning our first prediction, we found significant differences in jealousy, as pill-users found jealousy-provoking scenarios to be more disturbing than did naturally cycling women. This applied to all the single vignettes indicating infidelity, except one. The effect of hormonal contraceptives was also found in other studies (e.g., Geary et al., 2001; Cobey et al., 2010; Cobey et al., 2012). In the current study, the vignette *phone calls* showed a difference in the predicted direction, but not significantly so. The scenarios where their partner receives frequent text messages (SMS), looking at the butt of another woman, getting new female friends on Facebook, and where he boosts the skills and physical appearance of his new coworker, can all be seen as situations indicating infidelity. If a woman's partner spends much time with another woman whom he perceives as both attractive and successful, this may provoke an upset feeling because of the potential threats. They could risk losing their partner

to another woman. Our findings could be explained by the heightened estrogen and progesterone levels in contraceptives. Both these hormones are increased during pregnancy and could thus explain why HC-users are more jealous. Since women using hormonal contraceptives have higher levels of hormones in their body, they respond with stronger emotions to jealousy and other conflicts that would indicate a threat, compared to women having a natural menstrual cycle, because the heightened hormone-levels make the body believe it is pregnant. Our results fit well with evolutionary theory, as Jealousy is seen upon as an adapted solution to the problems that the Pleistocene woman encountered, because the loss of partner could be crucial for her offspring (e.g. Trivers, 1972; Buss, 1988). Although we found differences in emotional distress related to jealousy between HC-users and non-users, we cannot state causality. The jealousy-provoking vignettes can be interpreted in a variety of ways, individually. For example, while some individuals might see the partner's interactions with another individual as harmless, others have the potential to see the same conversation or situation as containing flirtatious undertones and threatening their relationship.

However, "Phone calls" and "Female coworker" seem to be the most upsetting situations within the infidelity-aspect, while "Facebook" seems to be least upsetting. These findings can be linked to meaning behind these vignettes. *Phone calls* and *Female coworker* indicate that the partner invests much time in another woman, and since Buss & Schmit (1993) found that investment was important for women, they could easily perceive their partner's "helping hand" or the female friend's continual requests, as a potential threat to her monopolization of partner's resources. For a pregnant Pleistocene woman, this could lead to a tremendous outcome for her child as it loses parental care.

Synthetic hormones and couple conflicts.

None of the grouped vignettes (e.g. Emotional support, Time&Effort and Commitment), nor the overall vignettes showed a significant difference between the two groups of women. However, looking at each of the single vignettes, the use of HC seemed to affect the emotional response regarding the vignette *Dining out*. Thus, HC-women found it more upsetting compared to naturally cycling women if they imagined a situation where their partner claims that dining out to mark a special occasion is too expensive. A situation like this indicates poor economy or an ungenerous partner. Both may cause some irritation, but poor economy among students is well known, and may not provoke as much as an ungenerous partner would. Constraints as follow from the Sexual Strategies Theory made women seek

mates who showed ability and willingness to invest resources in themselves and their offspring (Buss & Schmitt, 1993), thus women desire a mate who has good financial prospects and elevated social status (Buss, 2007).

The t-test also yielded an unexpected significant difference that went in the opposite direction, where naturally cycling women reported these two vignettes as more upsetting (e.g. *Stressed about work* and *Visitors, does not clean or cook*). These were incongruent with our hypotheses, and somewhat difficult to explain. One of the reasons for using two-tailed was to be open-minded for our scenarios to go in the opposite direction of what was expected, because both directions could be of interest. It is worth mentioning these differences between naturally cycling women and HC-users. The vignette *Visitors, does not clean or cook* describes a situation where the couple is expecting visitors and need to clean and cook before the visit, but the partner refuses to assist. This vignette could be a typical situation regarding housecleaning, which is found to be one of the most ordinary conflict areas among couples (Gottman, 1979; Mead, Vatcher, Wyne & Roberts, 1990; Heimdal, Dørmænen and Træen, 2008). The vignette *Stressed about work* is reflecting a lack of emotional support from partner. It could be that these types of conflicts are perceived as more upsetting among naturally cycling women because of some underlying factors (e.g., planning to become pregnant in near future with current partner). Hence, perhaps a lack of emotional support would be more upsetting if one wishes to become a mother, than if one uses hormonal contraceptives to prevent a pregnancy.

Other vignettes also found HC-influence in the opposite direction (e.g. *Emotional Unpleasant, Uninterested in talk, Stressed about work, Packages, says you are wasting money and Forgetting*), however, the differences were non-significant.

The conflict-scenarios are interpreted by individuals, meaning that the women can differ in their interpretations, and also their personality. To illustrate this, two of the subjects commented (in the comment field at the end of the questionnaire) that they spent as much time as their partner on the computer, and hence did not consider the scenario *much time on computer* as a problem.

Taking a more detailed look into the data, *not interested in children* was not perceived as very upsetting by neither the HC-users nor the non-users. A possible explanation might be the fact that our sample consisted of students, implying that they are at a stage in life where their desire for children is not prioritized. The same applies to *Buy/rent apartment together*. They are at a “student-stage” of life, and may not feel a strong need to settle down yet. Even if the analysis of the three other conflict-groups did not find them to be related to Hormonal

Contraceptives, it yielded an interesting disclosure of what was perceived as most upsetting. The Emotional support came in first place, then second Time & Effort, then Jealousy and Commitment on third and fourth place, which is consistent with other studies that have found money, jealousy and friends to be some of the highest-rated problems (Kurdek, 1994; Storaasli & Markman, 1990) The vignettes were made on the basis that money, jealousy and friends are rated as some of the greatest problems (Kurdek, 1994; Storaasli & Markman, 1990), and on evolutionary theories, where jealousy is seen as an adapted psychological defense or protection in a long-term relationship, and where commitment and investment would be highly important for the Pleistocene woman (Trivers, 1972; Feingold, 1992; Buss & Schmit, 1993; Buss & Haselton, 2005; Haselton & Gangestad, 2006; Gangestad, Thornhill & Garver, 2002).

Fertility status

Using GLM, we expected to find that naturally cycling women would be more affected by menstrual cycle in their responses to conflicts, than women using hormonal contraceptives.

However, our study did not reveal any significant main effect of fertility status on jealousy, nor on the overall couple conflicts or the grouped conflicts (e.g., Emotional support, Time & Effort and Commitment). Our findings did thus not support our hypotheses or previous studies that found naturally cycling women's levels of jealousy increases when fertile, (Cobey et al., 2012). Except from explanations due to sample size and measurement (more about this in the Limitations section), there is a possible explanation, which is contradictory to the study of Cobey et al., (2012). In a study conducted by Jones, Little, Boothroyd, DeBruine, Feinberg, Law Smith, Cornwell, Moore, Perrett (2005), they found that, for women who were naturally cycling, the commitment to their romantic relationship were strongest on days when progesterone level increased.

Partner's attractiveness

Looking further in to the effect of fertility status, we wanted to control for partner's attractiveness since studies have found that partner's lack of attractiveness makes women show more interest in other men and less commitment to their current partner (Chen, 2005; Gangestad, 2007). We expected to see interactions between natural cycle, fertility status and partners' sexual attractiveness on women's emotional distress towards couple conflicts and

scenarios indicating infidelity. We thus expected an increase in reported jealousy for naturally cycling women at days with high conception risk (fertility status) if they were mated with a man whom they perceived as attractive. However, with the strict alpha level, our hypotheses were not supported, as we did not find any significant interaction between partner's attractiveness and fertility status on neither Jealousy nor the other couple conflicts.

Our results did reveal a non-significant trending in the predicted direction indicating that the partner's physical attractiveness interact with fertility status and affect how women respond to situations regarding Jealousy and couple conflicts. Women seem to prefer characteristics like ambitiousness, character, and intelligence in a mate (Feingold, 1992), and other traits that would indicate parental investment (Trivers, 1972). Women seem to report stronger levels of jealousy when fertile (Cobey et al., 2012), appreciate properties such as physical attractiveness (Gangestad, 2007), and taking more initiative to sex with primary partner when fertile (Gangestad et al., 2002). Looking at the tendencies in our study, it seems like partner's attractiveness influence women's response to couple conflicts and jealousy-provoking scenarios. One of the tendencies being that fertility status and partner's intelligence seem to interact for the overall conflicts, the Time&Effort conflicts, and for the jealousy-provoking scenario, meaning that when women are fertile, they report overall couple conflicts and conflicts regarding infidelity as more emotionally distressing, depending on how much they perceive their partner as intelligent. Partner's agreeableness also showed a non-significant trending as it yielded a interaction with fertility status on commitment-scenario and showed a non-significant main effect on both jealousy and the overall couple conflicts. Given that the women are fertile and perceive their partner as agreeable, they get more upset by conflicts indicating a lack of Commitment. Partner's sexual attractiveness did seem to have the tendency to effect women's emotional response for both commitment and Jealousy-provoking scenarios, which may indicate a trend in that the women who perceive their partner as sexually attractive, get more upset by conflicts indicating infidelity and a lack of commitment. This was also found in interaction with fertility status. Partner's sexual attractiveness also had a main effect on the overall conflicts.

A suggested explanation to these non-significant trending is that women who perceive their partner as sexually attractive, intelligent or agreeable, may be more satisfied with their choice of partner and hence be more long-term oriented and involved in their current relationship. Women select mates who are willing to commit time and who are able and willing to provide resources and protection to the family (Buss, 1989). If they perceive their

partner as sexually attractive, they might expect their partner to be attractive for other women as well, which in turn makes these women feel more vulnerable to outside threats. Their attractive partner could be of interest to other women, which gives them the opportunity to leave their current partner for the benefit of another woman whom they would find more appealing. Thus, as an adapted protection, women may become more alert to situations indicating a lack of commitment and situations indicating infidelity when partnered with an attractive partner. Women's Inclusive fitness is strongly linked to high parental investment and therefore their discrimination is specifically directed towards faithfulness. At the same time, when partnered with a physically attractive partner, this may improve their offspring's genetic benefits.

It is suggested that when women are fertile, they search for men other than their primary partners (Gangestad et al. 2006; Gangestad et al. 2002), particularly if they perceive their partners as low in sexual attractiveness (Pillsworth & Haselton, 2006). This may be a result of their subconscious wishes to secure their offspring good genes. However, during ovulation, the female body is ready for fertilization and hence the women may probably be more interested in their current partner and more proprietary. We did find, based on the present study, some trends indicating an interaction between fertility status and partner's attractiveness influences women's emotional response to conflict.

Unlike the independent t-test where we used a significance level at .05, for the GLM repeated measure, the significance level was cut to .001. This may be a conservative approach, but when doing this, we reduced the probability of doing a Type I error, and reducing the probability of making the wrong decision if the null hypothesis is true. If we are too strict when choosing significance level, it could lead to a Type II error, where in fact the null hypothesis are not rejected even if the alternate hypothesis is true. We attempted to balance this by cutting the alpha level, and at the same time be open-minded when looking at what the analysis yields, such as giving some attention to the non-significant results and what may seem like tendencies in the expected direction. We cannot, based on the current study, conclude that fertility and partner's attractiveness play any role in women's emotional distress to couple conflict, but we strongly suggest that this is something that should be investigated further in future research.

Limitations

There are some limitations to our research. First and foremost, our results are limited by the nature of our sample as it consisted only of students, and thus they do not reflect the entirety of Norwegian women. However, university students are often used as participants in research (e.g. Haselton & Gangestad, 2006). Secondly, our sample is small, especially the group with women who are naturally cycling (not using hormonal contraceptives), and it hence may reduce the power of our study. Thirdly, it could be that our scenarios, which described several situations, were a little vague, and thus it may be interpreted very differently. Also, the questions might have given clearer results if the scenarios had been visualized, since it has been found that visual stimuli produce greater psychological distress than thought-produced stimuli (Landolfi, Geher and Andrews, 2007).

A fourth limitation in this study is the measurement of menstrual cycle. Since this study is a master thesis, there was no financial support, and thus it was necessary to use a method involving no financial cost. Hence, the method of self-reported menstrual cycle was assumed to be suitable for this study, as such self-reports on menstrual onset and duration have been used in other studies (e.g. Haselton et al., 2006) to detect ovulation. We also included questions about cycle variability, which are suggested by Small et al. (2007) when using self-report. However, Small et al. (2007) found evidence that women's self-reported cycle length can be inaccurate, with the difference between estimated and actual cycle length being more than 2 days. Also, a recent study (Wideman, Montgomery, Levine, Beynnon and Schultz, 2012) suggest that self-reported menstrual cycle and calendar-based counting methods should not be used alone if it is essential to have an accurate identification of ovulation. Wideman et al. (2012) further suggest that self-report data should be combined with both urinary ovulation test and blood sampling.

We got some feedback from the participants through a comment-field in the questionnaires. Many were satisfied with the questionnaire and found it to be very clear and precise. However, two subjects commented the scale used for the vignettes and found it vaguely defined what the numbers were representing (e.g. 50% upset). One subject also found the definition of the term "upset" difficult to interpret.

There may be pre-existing differences (e.g., personality, sexual experience, socioeconomic status), between the women who choose to use hormonal contraceptives and those who do not, and by using a between-subject design (e.g. the same women first on pill and then naturally cycling), these have not been controlled for. Cobey et al., (2012), used a

within-subject design in which they tracked their participants both while they were regularly cycling and after they commenced hormonal contraceptive use. Thus they measured changes in behavior as women switch from not using hormonal contraceptives to using hormonal contraceptives. Alvergne & Lummaa (2009) suggest that within-subject design should be endorsed in future research. In the current study, the measure of fertility status was a within-subject design as it was measuring each of the women's days with high fertility risk (ovulation).

Our non-significant results may be explained by low power due to our sample-decrease. The studies indicate that women show less interest in their partner and less commitment to the relationship (e.g. Gangestad et al. 2006; Gangestad et al. 2002), thus the women may not feel much commitment to their partner around ovulation. However, the study of Cobey et al. (2012) found evidence for cycling shifts on jealousy, and this may be a pattern worthy of further investigation.

Future research

Since the use of hormonal contraceptives and natural cycle is very complex, more variables should be checked for.

Women's emotional response to conflict situations should be investigated further, involving more factors (e.g., reasons behind taking contraceptives) and using a more reliable measurement to detect the phases in menstrual cycle (e.g. Ovulation Kit). It could also be an idea to visualize the vignettes by making scenarios on video clips. This was the first idea before conducting this study, but this would require both time and financial resources and is thus more feasible for larger projects than for a master study. Another way to improve this study in future research is to use a within-subject design for pill-users by studying the same group of women who are first using hormonal contraceptives and then stop using. By doing this, it is easier to control for pre-existing differences, however, one cannot fully insure against underlying factors.

When ovulating, the Estrogen level increases and hence the women are more likely to conceive. However, if conception has not occurred, the estrogen level decreases while the progesterone level increases. If the woman has been fertilized, the levels of both Estrogen and Progesterone are heightened to sustain pregnancy. Both progesterones and estrogens are involved in pregnancies, thus a suggestion for future research is to study the relation between women's emotional response to couples conflict, and its relation to partners mate-value by

looking at cyclic shifts that includes days with heightened progesterone-levels. Also, it may lead to a better understanding if one could test if pregnant women differ from women using hormonal contraceptives, or if they resemble in their responses to couple conflicts and infidelity.

Conclusion

Throughout the course of this thesis, the role of hormonal influences on romantic jealousy and conflicts in general has been explored with an evolutionary and biological approach. This study provides evidence for the impact of pill-use. This study did not, however, support the hypotheses about fertility status` impact on women`s emotional response to conflicts and heightened levels of jealousy, nor did it yield a significant interaction between natural cycle and fertility status, nor an interaction with partner`s attractiveness. Even though these hypotheses were not supported, the analyses yielded interesting results suggesting a non-significant trending in that the partner`s physical attractiveness interact with fertility status and affect how women respond to situations regarding Jealousy and couple conflicts.

Even though they were not significant, it is still an important and noteworthy finding which deserves further investigation. However, there could be pre-existing differences involved in the effect, and it is important that such factors also be addressed in future studies.

The current study contributes to the literature as it yields results supporting that relationship jealousy is linked to the use of Hormonal Contraceptives. It also contributes to future research as it has revealed some tendencies that should be investigated further.

References:

- Alvergne, A., & Lummaa, V. (2009). Does the contraceptive pill alter mate choice in humans? *Trends in Ecology and Evolution*, 25, 171-179.
- Andersch, B., Wendestam, C., Hahn, L., & Øhman, R. (1985). Premenstrual complaints. I. Prevalence of premenstrual symptoms in a Swedish urban population. *Journal of psychosomatic obstetrics and gynaecology*, 5, 39-49.
- Aune, K. S. & Comstock, J. (1991). Experience and expression of jealousy: Comparison between friends and romantics. *Psychological reports*, 69, 315-319.
- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117, 497-529.
- Berg, C. J., Callaghan, W. M., Syverson, C., Henderson, Z. (2010). Pregnancy-related mortality in the United States, 1998-2005. *Obstetrics & Gynecology*, 116, 1302-1309.
- Betzig, L. (1989). Causes of conjugal dissolution: A cross-cultural study. *Current Anthropology*, 30, 654-676.
- Bush, C. R., Bush, J. P., & Jennings, J., (1988). Effects of jealousy threats on relationship perceptions and emotions. *Journal of Social and Personal Relationships*, 3, 285-303.
- Buss, D. M. (1989). From vigilance to violence: Tactics of mate retention. *Ethology and Sociobiology*, 9, 291-317.
- Buss, D. M. (1989). Sex differences in human mate preferences: evolutionary hypothesis tested in 37 cultures. *Behavioral and Brain Sciences*, 12, 1-49.

- Buss, D. M. (2000). *The dangerous passion: Why jealousy is as necessary as love and sex*. New York: Free Press.
- Buss, D. M. (2007). The evolution of human mating. *Acta Psychologica Sinica*, 39, 502-512.
- Buss, D. M., Larsen, R. J., Westen, D., & Semmelroth, J. (1992) Sex differences in jealousy: Evolution, physiology, and psychology. *Psychological Science*, 3, 251–255
- Buss, D. M., & Schmith, D. P. (1993). Sexual strategies Theory: An evolutionary perspective on human mating. *Psychological review*, 100, 204-232.
- Buss, D. M., & Shackelford, T. K. (1997). From vigilance to violence: Mate retention tactics in married couples. *Journal of personality and social psychology*. 72 (2), 346-361.
- Buss, D. M. & Shackelford, T. K. (2008). Attractive women want it all: Good genes, economic investment, parenting proclivities, and emotional commitment. *Evolutionary psychology*, 6 (1): 134-146.
- Carter, J. R., & Lawrence, J.E. (2007). Effects of the menstrual cycle on sympathetic neural responses to mental stress in humans. *Journal of psychology*, 585 (2) 635-641.
- Cobb, J. (1979). Morbid jealousy. *British Journal of Hospital Medicine*, 21, 511-518.
- Cobey, K. D., Pollet, T. V., Roberts, S. C., & Buunk, A. P. (2010). Hormonal birth control use and relationship jealousy: Evidence for estrogen dosage effects. *Personality and Individual Differences*, 50, 315-317.
- Cobey, K. D., Buunk, A. P., Roberts, S. C., Klipping, C., Appels, N., Zimmerman, Y., Coeling Bennink, H. J. T., Pollet, T. V. (2012). Reported jealousy differs as a function of menstrual cycle stage and contraceptive pill use: a within-subjects investigation. *Evolution and Human Behavior*, Article in press.

- Chen, J., Y-C., (2005). Changes in relationship quality across the female menstrual cycle: A diary study of dating couples. Masterthesis. Texas A & M University. Retrieved February 17, 2009, from Dissertations and Theses database.
- Collignon, O., Girard, S., Gosselin, F., Saint-Amour, D., Lepore, F., & Lassonde, M. (2010). Women process multisensory emotion expressions more efficiently than men. *Neuropsychologia*, 48(1): 220-225.
- Conger, R. D., Cui, M., Bryant, C. M. & Elder, G. H. (2000). Competence in early adult romantic relationships: A developmental perspective in family influences. *Journal of personality and Social Psychology*, 79, 224-237.
- DeSoto, M. C., Geary, D. C., Hoard, M. K., Sheldon, M. S. & Cooper, L. (2003). Estrogen fluctuations, oral contraceptives and borderline personality. *Psychoneuroendocrinology*, 28, 751-766.
- Duke, J. M., Sibbritt, D. W., Young, A. F. (2007). Is there an association between the use of oral contraception and depressive symptoms in young Australian women? *Contraception*, 75, 27-31.
- Feingold, A. (1992). Gender Differences in Mate Selection Preferences: A Test of the Parental Investment Model. *Psychological Bulletin*, 112 (1), 125-139.
- Feldman, S., & Gowen, K. (1998). Conflict negotiation tactics in romantic relationships in high school students. *Journal of youth and adolescence*, 27 (6), 691-717.
- Fisher, M. (2004). Female intrasexual competition decreases female facial attractiveness. *Proceedings of the Royal Society Series B-Biological Sciences*, 271, 283-285.
- Gangestad, S. W., Garver-Apgar, C.E., Simpson, J.A., & Cousins, A.J. (2007). Changes in women's mate preferences across the ovulatory cycle. *Journal of personality and social psychology*, 92 (1), 151-163.

- Gangestad, S.W., Thornhill, R., Garver, C. E. (2002) Changes in women's sexual interest and their partner's mate-retention tactics across the menstrual cycle: evidence for shifting conflicts of interest. *Proceedings of the Royal Society of London Series Biological Sciences*, 269, 975–982.
- Geary, D. C., Desoto, M. C., Hoard, K. M., Sheldon, M. S., & Cooper, M. L., (2001). Estrogens and relationship jealousy. *Human Nature*, 12, 299-320.
- Gottman, J. M., & Krokoff, L. (1989). Marital interaction and marital satisfaction: A longitudinal view. *Journal of Consulting and Clinical Psychology*, 57, 47-52.
- Harris, C. R. (2003a). A review of sex differences in sexual jealousy, including self-report data, psychophysiological responses, interpersonal violence and morbid jealousy. *Personality and Social Psychology Review*, 7, 102-128.
- Haselton, M.G., & Gangestad, S.W. (2006). Conditional expression of women's desires and men's mate guarding across the ovulatory cycle. *Hormones and behavior*, 49, 509-518.
- Haselton, M. G., Mortezaie, M., Pillsworth, E. G., Bleske, A. E., & Frederick, D. A. (2007). Ovulatory shifts in human female ornamentation: Near ovulation, women dress to impress. *Hormones and Behavior*, 51, 40-45.
- Hatcher, R. A. (2007). *Contraceptive Technology*. Chapter 2, pp. 13.
- Heimdal, M. R., Dørmænen, A., & Træen, B. (2008). Kranling i parforhold. *Tidsskrift for Norsk Psykologforening*, 45 (6), 695-703.
- Jones, B. C., Little A.C., Boothroyd, L., DeBruine, L.M., Feinberg, M.J., Law Smith, Cornwell, R.E, Moore, F.R., Perrett, D.I. (2005). Commitment to relationships and preferences for femininity and apparent health in faces are strongest on days of the menstrual cycle when progesterone level is high. *Hormones and Behavior*, 48, 283–

- Kennair, L. E. O., Nordeide, J., Andreassen, S., Strønen, J. & Pallesen, S. (2011). Sex Differences in Jealousy: A study from Norway. *Nordic Psychology*, 63, 20-34.
- Kessel, N. and Coppen, A., The prevalence of common menstrual symptoms, *Lancet*, 2 (1963) 61-64.
- Kirsner, B., Figueredo, A. & Jacobs, W. (2003). Self, friends, and lovers: Structural relations among Beck Depression Inventory scores and perceived mate values. *Journal of Affective Disorders*, 75, 131-148.
- Landoldfi, J., Geher, G., & Andrews, A. (2007). The role of stimulus specificity on infidelity reactions: Seeing is disturbing. *Current Psychology: Developmental, Learning, Personality, Social*, 26, 46-59.
- Lindmeier, A. (2011). Modeling and Measuring Knowledge and Competencies of Teachers: A Threefold domain-specific structure model for mathematics. p.166
- Lucas, T., Parkhill, M. R., Wendorf, C. A., Imamoglu, E. O., Weisfeld, C. C., Weisfeld, G. E., & Shen, J. (2008). Cultural and Evolutionary Components of Marital Satisfaction: A Multidimensional Assessment of Measurement Invariance. *Journal of Cross-Cultural Psychology*, 39, 109-123.
- Mathes, E. W., Adams, H. E., & Davies, R. M. (1985). Jealousy: Loss of relationship rewards, loss of self-esteem, depression, anxiety and anger. *Journal of personality and social psychology*, 6, 1552-1561.
- Meyer, J. H., Ginovart, N., Boovariwala, A., Sagrati, S., Hussey, D., Garcia, A., Yiung, T., Praschak-Rieder, N., Wilson, A. A., Houle, S. (2006). Elevated monoamine oxidase a levels in the brain: an explanation for the monoamine imbalance of major depression. *Arch Gren Psychiatry*, 63, 1209-1216.

- Moos, R.,H., Kopell, B.,S., Melges, F.,T., Yalom, I.,D., Lunde,D.,T., Clayton, B.,R., Hamburg, D.,A. (1968). Fluctuations in symptoms and moods during the menstrual cycle. *Journal of psychosomatic research*, 13 (1), 37-44.
- Mtawali, G., Pina, M., Angle, M., & Murphy, C. (1997). The menstrual cycle and its relation to contraceptive methods: A reference for Reproductive Health Trainers. *Prime*.
- Oinonen, K. A., & Mazmanian, D. (2002). To what extent do oral contraceptives influence mood and affect? *Journal of Affective Disorders*, 70, 229-240.
- Paige, K. E., (1971). Effects of oral contraceptives on affective fluctuations associated with the menstrual cycle. *Psychosomatic Medicine*, 33, (6), 515-538.
- Penke, L., & Asendorpf, J. B. (2008). Beyond global sociosexual orientations: A more differentiated look at sociosexuality and its effects on courtship and romantic relationships. *Journal of Personality and Social Psychology*, 95, 1113-1135.
- Pillsworth, E. G., Haselton, M. G., & Buss, D. M. (2004). Ovulatory shifts in female sexual desire. *Journal of Sex Research*, 41 (1), 55-65.
- Pillsworth, E. G., & M. G., Haselton, M. G. (2006). Male sexual attractiveness predicts differential ovulatory shifts in female extra-pair attraction and male mate retention. *Evolution and Human Behavior*, 27, 247-258.
- Protopopescu, X., Pan, H. , Altemus, M., Tuescher. O., Polanecsky, M., McEwen. B., Silbersweig, D., & Stern, E. (2005). Orbitofrontal cortex activity related to emotional processing changes across the menstrual cycle. *Proceedings of the National Academy of Sciences of the United States of America*, 102, (44) 16060-5.
- Schutzwohl, A. & Koch, S. (2004) Sex differences in jealousy: the recall of cues to sexual and emotional infidelity in personally more and less threatening contexts. *Evolution and Human Behavior*. 25, 249–257.

Shackelford, T. K., Voraeck, M., Schmitt, D. P., Buss, D. M., Weekes-Shackelford, V. A., Michalski, R. L. (2004). Romantic jealousy in early adulthood and in later life. *Human Nature, 15*, 283-300.

Small, CM, Manatinga, AK, & Marcus, M. (2007). Validity of self-reported menstrual cycle length. *Annals of Epidemiology, 17*, 163-170.

Storaasli, R. D. & Markman, H. J. (1990). Relationship problems in the early stages of marriage: A longitudinal investigation. *Journal of Family Psychology, 4*, 80-98.

Sveindottir, H. & Backstrom, T. (2000) Prevalence of menstrual cycle symptom cycling and premenstrual dysphoric disorder in a random sample of women using and not using oral contraceptives. *Acta Obstetrica et Gynecologica Scandinavica, 79*, 405-413.

Statens legemiddelverk. Hentet 15. oktober 2012 fra <http://www.legemiddelverket.no>
Hormones in contraceptives

Trivers, R. (1972). Parental investment and sexual selection. In B. Campbell, ed. *Sexual selection and the descent of man, 1871-1971*, Aldine-Atherton, Chicago, pp.136-179.

Wideman, L., Montgomery, M. M., Levine, B. J., Beynon, B. D., & Schultz, S. J. (2012). Accuracy of Calendar-Based Methods for Assigning Menstrual Cycle Phase in Women. *Sports Health: A Multidisciplinary Approach*, DOI: 10.1177/1941738112469930¹

Appendix

Appendix A. The Vignettes

Instructions: Think about your current relationship. How upset would you become if the following happened?

Item	text
Phone call	He continually receives phone calls from a female friend asking for help.
SMS	Your partner is receiving excessive text messages
Looking at butt	You think your partner was looking at the butt of another woman.
Female coworker	Your partner has a new female coworker which he says is very attractive and he boosts her skills.
Facebook	You see on Facebook that he has added a new female friend, whom you do not know
Emotional Unpleasant	You have experienced something emotionally unpleasant and want to talk about it, but he rejects you
Uninterested in talk	You feel the need to talk about something which is emotionally important to you, but he seems uninterested
Stressed about work	You are stressed because of work pressure, but he shows no sympathy and tells you to work harder
Too much time with friends	You think that he is spending too much time with his friends instead of with you
Packages, says you are wasting	He is constantly receiving packages in the mail, which contains stuff for himself. When you spend some money on things for yourself, he whines and tells you you're wasting money
Camping	You want to go camping this weekend, but he refuses and wants to spend time working on his own projects on the computer
Forgetting	You experience that important messages and talks are unnoticed or forgotten by your partner
Refuses to clean house	He refuses to use his day off to clean the house
Much time on computer	He has recently been spending much of his time on the computer
Rather play videogames	You want to spend time together, but he wants to play video games instead

Visitors, does not clean or cook	You're having visitors and have to clean and cook, but he doesn't want to help as he thinks it looks "ok"
Buy/rent apartment together	You want to buy/rent an apartment together, but he says he is not ready for that yet
Dining out, special occasion	You want to mark an occasion by dining out, but he thinks it's too expensive and suggests instead to cook food at home as usual.
Not interested in children	Your partner is not interested in having children for quite some time.

Appendix B. Vignettes Factor Loadings

Pattern Matrix^a

Items	Factor				
	1	2	3	4	
Your partner has a new female coworker which he says is very attractive and he boosts her skills	,764				
Continually phone calls from female friend asking for help	,763				
You see on Facebook that he has added a new female friend, whom you do not know	,748				
Frequently text messages incoming on your partners phone	,739				
You think your partner was looking at the butt of another woman	,659				
You have experienced something emotionally unpleasant and want to talk about it, he rejects you		,859			
You feel the need to talk about something which is emotionally important to you, but he seems uninterested		,817			
You are stressed because of work pressure, but he shows no sympathy and tells you to work harder		,668			
He is constantly receiving packages in the mail, which contains stuff for him. When you spend money on things for yourself, he whines and tells you you're wasting money		,418			
You think that he is spending too much time with his friends instead of with you	,309	,320			
recently been spending much of his time on the computer				-,815	
You want to spend time together, but he wants to play video games instead				-,768	
You're having visitors and have to clean and cook, but he doesn't want to help as he thinks it looks ok				-,618	
You want to go camping this weekend, he refuses and wants to spend time working on own projects on the computer				-,586	
Experience that important messages and talks are unnoticed or forgotten by partner				-,476	
Refuses to use his day off to clean the house				-,467	,308
You want to buy/rent an apartment together, but he says he is not ready for that yet					,663
Your partner is not interested in having children for quite some time					,561

You want to mark an occasion by dining out, but he thinks it's too expensive

,379

Note: Factor loadings < .30 have been suppressed.

Appendix C. The MVI-7_P

Instructions: Describe your current partner as correct as possible by checking on the scale from 1 to 7 for each of the 19 adjectives/statements below.

- 1.Ambitious
- 2.Attractive face
- 3.Attractive body
- 4.Desires children
- 5.Enthusiastic about sex
- 6.Faithful to partners
- 7.Financially secure
- 8.Generous
- 9.Good sense of humor
- 10.Healthy
- 11.Independent

- 12.Intelligent
- 13.Kind and understanding
- 14.Loyal
- 15.Responsible
- 16.Shares my values
- 17.Shares my interests
- 18.Sociable
- 19.Emotionally stable

Appendix D: MVI-7_P Factor loadings

Pattern Matrix^a

	Factors		
	Intelligent	Agreeable	Sexual Attractive
Independent	,650		
Intelligent	,635		
Ambitious	,463		
Responsible	,409	-,336	
Financially secure	,407		
Emotionally stable	,363	-,300	
Healthy	,310		
Sociable			
Loyal		-,773	

Kind and understanding	-,612	
Shares my values	-,547	
Faithful to partner	-,504	
Generous	-,372	
Shares my interests	-,369	
Good sense of humor	-,338	
Desires children	-,301	
Attractive body		,802
Attractive face		,662
Enthusiastic about sex		,343

Note: Factor loadings < .30 have been suppressed
