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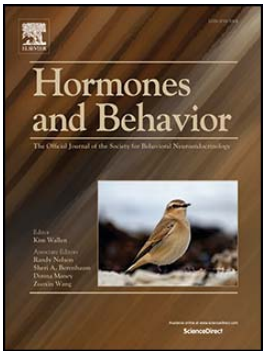


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Running head: Menstrual cycle and cuteness perception

# Menstrual cycle phase affects discrimination of infant cuteness

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Abstract

Recent studies have shown that women are more sensitive than men to subtle cuteness differences in infant faces. It has been suggested that raised levels in estradiol and progesterone may be responsible for this advantage. We compared young women's sensitivity to computer-manipulated baby faces varying in cuteness. Thirty-six women were tested once during ovulation and once during the luteal phase of their menstrual cycle. In a two alternative forced-choice experiment, participants chose the baby which they thought was cuter (Task 1), younger (Task 2), or the baby that they would prefer to babysit (Task 3). Saliva samples to assess levels of estradiol, progesterone and testosterone were collected at each test session. During ovulation, women were more likely to chose the cuter baby than during the luteal phase, in all three tasks. These results suggest that cuteness discrimination may be driven by cyclic hormonal shifts. However none of the measured hormones were related to increased cuteness sensitivity. We speculate that other hormones than the ones measured here might be responsible for the increased sensitivity to subtle cuteness differences during ovulation.

Menstrual cycle phase affects discrimination of infant cuteness

Interactions between a mother or father and a newborn form the most basic human social relationship. Immediately after birth, infants depend on parental caretaking behavior, such as feeding and protecting. This calls for a strong bond between the parent and the infant. Visual characteristics inherent in infant faces affect parent-infant bonding. Konrad Lorenz (1943) introduced the term *Kindchenschema* which is thought to be an innate releasing mechanism for care-taking behavior. The Kindchenschema is triggered by paedomorphic features such as a relatively large head compared to the size of the body, large eyes that lie below the horizontal midline of the skull, and round and protruding cheeks. While all infants show such paedomorphic features, the extent to which they conform to the Kindchenschema can vary. Infants whose facial characteristics closely correspond to the Kindchenschema are commonly described as cuter than infants whose facial characteristics deviate from the Kindchenschema (e.g., Alley, 1981; Brooks and Hochbeg, 1960; Glocker et al., 2009a; Hildebrandt and Fitzgerald, 1979; Hückstedt, 1965; McKelvie, 1993; Sternglanz et al., 1977).

Cute babies conform more to the Kindchenschema (e.g., Glocker et al., 2009a; Hildebrandt and Fitzgerald, 1979; Hückstedt, 1965; McKelvie, 1993; Sternglanz et al., 1977), and elicit enhanced emotional reactions (Glocker et al., 2009b). Glocker and colleagues (Glocker et al., 2009b) showed that cute infant faces increase neural activation in the mesolimbic dopamine system, which is strongly involved in approach related motivation. The nucleus accumbens also plays a role in the anticipation of reward. Therefore its activation in response to cute babies suggests that the baby schema is a positive incentive which provides motivational drive for caregiving behavior. Cuteness in a baby has also been shown to have a positive influence on the interactions between the child and its caretaker (Langlois et al., 1995).

Recent studies from our laboratories reported that women show a greater sensitivity to infant cuteness than men (Lobmaier et al., 2010; Sprengelmeyer et al., 2009). Using computer graphics software, images of infant faces were manipulated in cuteness and were presented to the participants in pairs of which one face was slightly cuter than the other. Women more reliably chose the cuter of two infant faces than men. This female advantage disappeared when the task was to choose the younger or happier baby (Lobmaier et al., 2010). These findings suggest that the sex difference in cuteness discrimination do not result from men lacking attention sensitivity to detect visual differences between infant faces. Using the same type of stimulus manipulation, Sprengelmeyer et al. (2009) found evidence that female reproductive hormones may be responsible for sex differences in cuteness discrimination. The female advantage disappeared in postmenopausal women: women after menopause performed no better than men. In most species, mothers are responsible for feeding and protecting the newborn. This calls for a stronger need for the mother to bond with the infant. According to Lorenz (1943), the Kindchenschema is responsible for releasing caretaking behavior and an affective orientation towards the infant. These findings are consistent with studies reporting that females work harder than men to view infant faces (Hahn et al., 2013; but see Parsons et al., 2013 and Sprengelmeyer et al., 2013 for conflicting evidence and a lack of sex difference).

One way to study influences of female gonadal steroids on cuteness discrimination is to examine naturally cycling women during different menstrual cycle phases. If female gonadal steroids such as estradiol and progesterone are indeed responsible for the female advantage in cuteness discrimination tasks (as suggested by Sprengelmeyer et al., 2009), then we would expect to find differences in the ability to discriminate cuteness across the menstrual cycle. The menstrual cycle is characterized by changing hormonal levels (e.g. Sherman and Korenman,

1975) and can be divided into two main phases: the follicular phase, which starts after menstruation and ends with ovulation, and the luteal phase which starts after ovulation and ends with onset of menstruation. At the beginning of the follicular phase hormone levels are typically low, in the late follicular phase estradiol levels increase and peak when the follicle reaches maturity. The luteal phase is characterized by increased progesterone levels, while estradiol levels slightly decrease and remain lower relative to the late follicular phase (Butt, 1979). Testosterone levels are highest around ovulation (Bloch et al., 1998; Dabbs and Delarue, 1991).

The aim of the present study was to further examine hormonal influences on cuteness discrimination. We tested women twice at two distinct time points of the menstrual cycle, once during ovulation, and once during the luteal phase. By comparing their performance in cuteness discrimination in these specific cycle phases we aim at scrutinizing whether progesterone, estradiol, and testosterone modulate cuteness discrimination. If estradiol and/or testosterone are mainly responsible for the sex effect observed by Sprengelmeyer et al. (2009) and Lobmaier et al. (2010), we expect women to more reliably detect the cuter of two baby faces when tested in the late follicular phase (near ovulation). Conversely, if elevated progesterone levels in females mainly accounts for the sex effect, we expect women to perform better when tested in the luteal phase.

## *Methods*

In Experiment 1 we compared the sensitivity to computer-manipulated baby faces varying in cuteness. Using a two alternative forced-choice paradigm, we asked participants to choose the cuter baby (Task 1), the younger baby (Task 2), and the baby that the participant would prefer to baby-sit (Task 3). Task 1 hence explicitly asked for cuteness evaluations. In Task

2, infant faces that were cuter (and thus activated the Kindchenschema more strongly) were expected to be rated younger than less cute infants. Finally, Task 3 used a more implicit measure for cuteness preferences. Here we expect cuter infants to be chosen more often in the baby-sit task. Hence, the predictions for all three tasks were the same: we expected that participants would more often choose the cuter infant in all three tasks. To investigate whether the cycle phase modulates general cuteness appreciation, we also asked participants to rate a series of infant faces for cuteness (Experiment 2).

*Participants*

Participants were recruited via e-mail, internet, and flyers and were first screened for the following inclusion criteria: (a) no use of any hormonal contraception for at least the last 3 months, (b) not pregnant or breastfeeding, (c) regular menstrual cycle (between 25 and 35 days), (d) currently under no kind of medication and (e) aged between 17 and 40 years. A total of 37 women were preselected, of which 8 had to be excluded at a later stage because hormonal analyses revealed that they were not tested during the right phase (higher progesterone levels during the alleged ovulation phase, see Israel et al., 1972) or did not have an ovulatory cycle.

Selected participants were randomly assigned to two groups which differed only in the order in which they were tested. Group 1 (n=15) was first tested during the late follicular phase and then during the luteal phase, Group 2 (n=14) was tested first during the luteal phase and then during the late follicular phase. The groups did not differ with respect to age, menstrual cycle length, experience with children, stress and mood states (see Table 1).

---- insert Table 1 about here ----

All participants provided written informed consent to take part in this study and were treated in accordance with the ethical protocol approved by the Faculty of Human Sciences of the University of Bern and The Code of Ethics of the World Medical Association (Declaration of Helsinki).

*Procedure*

Women were pre-screened through an online questionnaire in which we collected demographic information such as sex, age, sexual orientation, relationship status, desire to have children, and the amount of time the participants spend with young infants. Additionally they provided information about their menstrual cycle (regularity, length and last menstrual bleeding) and their contraception methods. Only women who met the above mentioned criteria were contacted by telephone. Each participant came into the laboratory twice for an experimental session (once during the late follicular phase and once during the luteal phase). In both test sessions the participants were tested at the same time of day.

Ovulation was determined using WH OvultellTM test strips which measure the concentration of metabolite from luteinizing hormone (LH) in urine. The surge in LH provokes ovulation in the next 24-36 hours and corresponds to the oestrogen peak level and thus is a valid assessment for the onset of ovulation (Miller and Soules, 1996; Saketos et al., 1994). The participants started using the ovulation tests 5 days prior to the expected time of ovulation based on the average cycle length of each individual woman. The women performed the ovulation test twice a day (morning and evening). After positive testing, the women reported to our laboratory and were then either tested within 48 hours of LH surge and then again 7 days later (ovulation-luteal group) or they were scheduled 7 days after the measured peak of the LH surge (luteal-

ovulation group). Participants of the luteal-ovulation group again assessed the LH surge in the following cycle and were then tested within 48 hours of the next LH peak.

In each test session participants completed two experiments described in detail below. In order to monitor menstrual cycle effects on mood or stress, subjects also completed the Positive and Negative Affect Schedule (PNAS, Watson and Clark, 1988) and the Perceived Stress Scale (PSS, Cohen et al., 1983) at the end of each session.

In order to assess phase-specific hormone levels, participants provided saliva samples at both sessions (i.e., in the ovulation and luteal phase) using a commercially available sampling device (Salivette; Sarstedt, Rommelsdorf, Germany). Specifically, participants placed a synthetic polypropylene roll in their mouths and chewed it for 45 seconds to stimulate salivation. The saliva samples were then stored at -20°C. After thawing, saliva samples were analysed by an independent laboratory (Dresden Lab Service GmbH, Dresden, Germany) using commercially available radioimmunoassay kits adopted for the analysis of salivary estradiol, progesterone, and testosterone (IBL International, Hamburg, Germany).

*Stimuli*

We used the same stimuli as Lobmaier, et al. (2010). In short, we used five female and five male composite images of baby faces. These composites were each made up of five individual faces (aged 6-8 months) using PsychoMorph software (Tiddeman et al., 2001). Using the same software, each of these composite faces was then shape transformed in four steps (12.5%, 25%, 37.5% and 50%) towards a cute and a less cute prototype, respectively. Prototypes were created by averaging 10 highly cute infant faces (cute prototype) and 10 relatively less cute infant faces (less cute prototype). See Supplementary Material I for details on stimulus creation. We paired

the resulting eight transforms in a way that each face pair differed by 25%, 50%, 75% and 100%. Stimulus examples are shown in Figure 1.

---- insert Figure 1 about here ----

*Tasks*

During each session, participants completed two experiments. The first experiment comprised three tasks in two-alternative choice format (2AFC) presented with the software SuperLab 4.0 (www.cedrus.com). Specifically, a face pair was presented consisting of one cute and one less cute transform (differing by 25%, 50%, 75% or 100%) of the same composite face identity. Pairs were shown in both lateralizations: the cute face was once on the right and once on the left half of the screen. Hence a total of 80 face pairs were shown in each task. (2 lateralization on screen x 2 sex of face x 4 cuteness difference levels x 5 composites) were shown in each task. Each trial started with the presentation of a fixation cross (1000 ms) which was replaced with a stimulus pair displayed until the participant's response. Participants were asked to choose the cuter baby (Task 1), the younger baby (Task 2) or the baby they would prefer to baby-sit (Task 3). In each task, participants completed a total of 80 randomized trials. Participants were told that the infant faces may look very similar and were instructed to look out for subtle difference between them, but were encouraged to follow their first impression and to make their choice as quickly as possible. Note that the face pairs presented in Tasks 2 and 3 were identical to the ones used in Task 1 (i.e. all stimulus pairs differed in cuteness only), what changed was the criterion on which participants were asked to choose the infant face. Stimulus order within each task was randomized.

Experiment 2 was designed to control for the possibility that potential cycle effects in cuteness discrimination are driven by a general tendency to find babies cuter in one cycle phase. If, for example, women generally find all babies particularly cute during the luteal phase, it could be that they perform poorly on a cuteness discrimination task during the luteal phase, simply because they find both babies very cute (and as a result they cannot see any difference in cuteness between the two). In Experiment 2 participants were asked to rate the cuteness of 70 front-view photographs of baby faces on a 7-point scale (1=*not cute*, 7= *very cute*). These images were natural, unmanipulated photographs of infants collected from different sources (internet, personal collections). None of these images were used in Experiment 1. Each image remained on the screen until it was rated, but again participants were encouraged to follow their first impression and to make their choice as quickly as possible. In Experiment 1, Task 1 was always completed first; the order of Tasks 2 and 3 was randomized across participants. This was done because we did not want Task 2 or 3 to interfere with Task 1 (cf. Lobmaier et al. 2010). Experiment 2 always came last.

## *Results*

### *Hormone assays*

Average hormone levels during each cycle phase are shown in Table 1. Uncorrected means and standard deviations are reported, yet all statistical analyses on hormone levels were conducted using log-transformed hormone data, in order to achieve normality. Hormone assessments revealed that progesterone levels were significantly higher during the luteal phase than at the time of ovulation ($t_{log}$ = -8.77, $p$ < .001, $d$ = 1.63). However, levels of estradiol ($t_{log}$ = .74, $p$ >

.47, $d$ = 0.14) and testosterone ($t_{log}$ = 1.18, $p$ > .25, $d$ = 0.22) did not differ between the two phases.

---- insert Table 2 about here ----

*Experiment 1: Discrimination Tasks*

For all three 2AFC tasks (Experiment 1) we analysed the proportion of trials were the cuter infant face was chosen. Preliminary analyses showed no main effect of session order ($p$ = .930) and no significant interaction containing the factor session order (all $p$'s >.145). We therefore neglect the group factor session order (ovulatory-luteal, luteal-ovulatory) in all following analysis.

We analysed the results of the three 2AFC tasks using a repeated-measures ANOVA with task (cuteness, age, babysit), phase (ovulation vs. luteal phase) and task difficulty (25%, 50%, 75% and 100%) as a repeated factors. The Huynh-Feldt epsilon correction for heterogeneity of covariance (Huynh and Feldt, 1976) was used when sphericity could not be assumed. We report $\eta^2$ as a measure of effect size. For post-hoc pairwise comparisons we used the Bonferroni correction and Cohen's $d$ as a measure of effect size.

One-sample t-tests revealed that all women chose the cuter baby more often than could be expected by chance in all tasks, in both phases and at each level of task difficulty (all $p$'s < .001; $d$ > 1.66). The 3x2x4 ANOVA revealed a significant effect of task, $F$(1.61, 45.16) = 3.50, $p$ = .048; $\eta^2$ = 0.032, resulting from the fact that women most often chose the cuter baby when asked to choose the baby they would prefer to babysit ($M$ = .74, $SD$ = .02), followed by the task to choose the cuter ($M$ = .68, $SD$ = .02) and younger face ($M$ = .67, $SD$ = .02). However, no

Bonferroni-corrected pair-wise comparison reached statistical significance (all $p$'s > .067, all d's < 0.44). There was a main effect of menstrual cycle phase, $F(1, 28) = 6.63$, $p = .016$; $\eta^2 = 0.013$ revealing that in the ovulation phase women more often chose the cuter baby ($M_{ovu} = .72$, $SD_{ovu} = .02$) than in the luteal phase ($M_{lut} = .68$, $SD_{lut} = .02$). There was also a significant effect of task difficulty, $F(2.73, 76.56) = 122.97$, $p < .001$; $\eta^2 = 0.213$, reflecting that the cuter face was more often chosen as the cuteness difference in the face pairs increased. No interactions reached statistical significance ($p > .199$; $\eta^2 < .006$). The results are shown in Figure 2 (see also Supplementary Material II).

---- insert Figure 2 about here ----

To specifically test whether gonadal steroids are responsible for the better cuteness discrimination ability during the late follicular phase, we followed a method described by Judd, Kenny and McClelland (2001) and calculated a multiple regression analysis with the difference between cuteness discrimination at ovulation and luteal phase as dependent variable and the differences in hormone levels as predictors. Increased discrimination ability during the late follicular phase was not predicted by estradiol, or progesterone, or testosterone, revealing that none of the hormones investigated here was related to cuteness discrimination (see Table 3). Tolerance was greater than .10 (all > .63), and the viariance inflation factor was less than 10 (all < 1.57) suggesting that multicollineartity was not an issue (cf., Bowerman and O'Connell, 1990; Menard, 1995). Several additional analyses investigating between-participants effects revealed similar results, namely that hormone variations do not explain the variance in cuteness discrimination (see Supplementary Material II: Additional Analyses).

---- insert Table 3 about here ----

So, despite the finding that the ability to discriminate between cute and less cute babies was modulated by the menstrual cycle phase, we found no evidence that cuteness discrimination is modulated by estradiol, progesterone or testosterone.

*Experiment 2: Cuteness Ratings*

Means and standard deviations of the ratings were entered to separate repeated-measure ANOVAs with phase (ovulation vs. luteal phase) as a repeated factor, revealing no effect of phase effect, neither for the means, $F(1, 26) = 0.01$, $p = .914$; $\eta^2 < 0.001$) nor for the standard deviations, $F(1, 26) = 0.02$, $p = .884$; $\eta^2 < 0.001$). In addition, we calculated a correlation analyses between cuteness ratings in the two cycle phases. Women gave highly comparable ratings in both cycle phases ($r = .89$, $p < .001$; see Figure 3). This implies that the results of Experiment 1 do not result from women generally finding babies cuter during the luteal phase, which might have led to women finding it more difficult to discriminate between cute and less cute babies. The results are shown Figure 3.

---- insert Figure 3 about here ----

*Discussion*

In this study we investigated whether the ability of women to discriminate between the faces of a cute and less cute infant changes across the menstrual cycle. We found that in various tasks women were more likely to choose the cuter infant when they were tested in the late follicular phase (i.e. around ovulation) as compared to the luteal phase. This effect did not result from a general more positive evaluation for infants in one phase. Participants rated a range of baby faces as equally cute in both phases, indicating that the concept of cuteness does not change across the

cycle. This result is consistent with the findings of Sprengelmeyer, Lewis, Hahn & Perrett (2013), who also find no evidence that the concept of cuteness in infant faces may be modulated by cycle phase. What seems to be modulated by the menstrual cycle phase is the actual ability to pick up on subtle cuteness differences in infant faces.

We used three different tasks to measure preferences for cute infant faces. In the first task we explicitly asked women to choose the cuter face. In the second task we asked the same women to choose the younger infant. We note that there was no objectively correct answer in judgments of age, but because the *kindchenschema* is activated by neotenous cues, we expected the cuter infants to be perceived as being younger. In the third task women chose the infant that they would rather look after, which might be a more implicit measure of cuteness preference. In all three tasks we found that women significantly more often chose the cuter face. The main effect of task suggests that women most often chose the cute face in the more implicit baby-sit task, and that they least often chose the cuter face in the age task. We note however that no pair-wise comparisons reached statistical significance.

Since the menstrual cycle is characterized by phase specific shifts in hormone levels, the present results suggest the influence of hormones when women discriminate between cute and less cute infants. The same infants that were judged as being cuter were also perceived as being younger. Cuter babies were also more likely chosen in the care-taking task. This is in line with findings of Glocker et al. (2009a), who reported that cuteness induces caretaking motivation (see also Lorenz, 1943) and with Hahn et al. (2013), who found that men and women were more motivated to work to see cute babies (but see Parsons et al., 2011; Sprengelmeyer et al., 2013 for conflicting evidence and a lack of gender difference). The present findings suggest that women might be even more motivated to care for a cute baby around ovulation.

The main motivation of the present study was to scrutinize whether the sex differences in cuteness discrimination found by Lobmaier et al. (2010) are mediated by female gonadal hormones, as suggested by Sprengelmeyer et al. (2009). Indeed, the cycle effects found in the present study suggest the involvement of gonadal steroids, such as estradiol, progesterone and testosterone. However, we were unable to relate these cycle effects to a specific hormone. While Sprengelmeyer et al. (2009) suggested that estradiol and progesterone might be involved, we found no evidence for this claim in the present study. We found that women could better discriminate between cute and less cute infants during the late follicular phase, which might specifically suggest that estradiol may be responsible for this better performance, yet estradiol levels did not differ significantly between the two phases. Furthermore, changes in levels of estradiol, progesterone and testosterone failed to predict the phase dependent changes in cuteness discrimination ability.

Why do our results suggest a cycle effect in cuteness discrimination in the absence of any reliable hormone variation? Three reasons might explain these results. First, our saliva sampling device might have biased the hormonal results. There has been some discussion recently that Salivettes might alter salivary concentrations of gonadal steroids (Celec and Ostatnikova, 2012). However, such biases are a problem especially when comparing results of different studies or when comparing between hormonal levels of men and women. In the present study we used the same device (Salivette polypropylene rolls) for all participants, and all our participants were women. Second, due to our relatively small sample, we might have missed small hormonal effects. We note however, that we used a within-participants design, which is more sensitive to intra-individual variation, and this design was powerful enough to detect behavioral differences. Finally, while studying women in different cycle phases is a common method to make inferences

about sex hormone influences, estradiol, progesterone and testosterone are not the only hormones that vary with the menstrual cycle phase. Other neuropeptide hormone concentrations that rise in the late follicular phase include prolactin (e.g., Subramanian et al., 1997) and oxytocin (Salonia et al., 2005). Incidentally, prolactin and oxytocin levels are also raised postpartum, when it is especially important that mothers bond with their child (e.g., Brunton and Russell, 2008). Indeed, oxytocin facilitates mother-child bonding (Heinrichs et al., 2009). Prolactin is best known for its stimulating effect on lactation, but it has also been shown to play a role in parental behavior, at least in other species (e.g., Mann and Bridges, 2001). Oxytocin and prolactin (rather than estradiol, progesterone, and testosterone) might therefore be responsible for the raised sensitivity to infant cuteness during the late follicular phase. The finding that women can better discriminate cuteness in the late follicular phase might thus reflect an epiphenomenal by-product rather than a direct benefit. While it is not adaptive that women are more sensitive to subtle differences in facial cuteness during ovulation, it is highly adaptive after parturition. To directly test whether oxytocin and prolactin influence infant cuteness discrimination will have to be the aim of future administration studies. Despite these limitations, we were able to clearly demonstrate intra-individual variations of cuteness discrimination across the cycle suggesting that endocrine mechanisms are somehow involved.

To summarize, the present study extended on previous findings that females are more sensitive to subtle differences in infant cuteness than men by showing that women are especially sensitive to such differences during the fertile phase of their cycle. While we were unable to link these behavioural effects with levels of estradiol progesterone or testosterone, we propose that the variations in cuteness discrimination found in the present study might be modulated by

prolactin and oxytocin. Because these hormones are also raised post-partum, we speculate that raised concentrations of prolactin and oxytocin help to maximize care.

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Table 1: Socio-demographic details on female participants in ovulatory-luteal group (Ovu/Lut) and luteal-ovulatory group (Lut/Ovu)

| | Group; mean (SD) | |
|---|---|---|
| | Ovu/Lut | Lut/Ovu |
| Characteristic | *N=15* | *N=14* |
| Age, mean (SD) [range] | 24 (4) [20-32] | 25 (5) [20-35] |
| Relationship, yes: no | 07:08 | 07:07 |
| Children, yes: no | 01:12 | 01:13 |
| Perceived Stress Scale (PSS) | 20 (6) | 25 (9) |
| The Positive and Negative Affect Schedule (PANAS) | | |
| Positive Affect | 35 (3) | 34 (5) |
| Negative Affect | 19 (6) | 23 (9) |
| Menstrual cycle length | 30 (2) [27-36] | 29 (2) [26-33] |

*Note: the groups did not differ in any relevant measured variables.*

Table 2:Hormonal levels in the two menstrual phases

| | Estradiol [pg/ml] | Progesterone [pg/ml] | Testosterone [pg/ml] |
|---|---|---|---|
| Ovulation, mean (SD) | 3.78 (1.35) | 27.40 (12.13) | 10.48 (5.44) |
| Luteal phase, mean (SD) | 3,67 (1.62) | 48.67 (18.89) | 9.51 (6.02) |
| Paired *t*-test | $p = .465$ | $p < .001$ | $p = .249$ |

*Note. paired t-tests on log-transformed hormone values appear in the table. Degrees of freedom=28.*

Table 3: Association between cuteness discrimination and hormone levels

| Predictor variable [a] | *b* | *SE* | *t* | *p Value* |
|---|---|---|---|---|
| Progesterone Δ | 0.001 | 0.10 | 0.01 | 0.996 |
| Estradiol Δ | 0.12 | 0.10 | 1.21 | 0.238 |
| Testosterone Δ | -0.02 | 0.06 | -0.40 | 0.694 |
| (Constant) | 0.06 | 0.03 | | 0.054 |

[a] difference between hormone levels was calculated by subtractin hormone levels during luteal phase from the hormone level at ovulation

Figure Captions :

*Figure 1.* Examples of baby faces transformed in cuteness. The infant image shape on the left has been manipulated in shape in order to reduce cuteness by 50%, the image shape on the right has been manipulated in order to enhance cuteness by 50%, resulting in a difference of 100%.

*Figure 2.* Cuteness Discrimination pooled across all three tasks by ovulation and luteal phase. Proportion correct is given as a function of the 'cuteness difference' in stimuli (i.e., the % cuteness transform difference applied to the pairs of infant face stimuli). 0.5 corresponds to chance level; error bars depict SEM's).

*Figure 3.* Mean cuteness ratings of each participant. Cuteness ratings given during luteal phase are plotted on y-axis, ratings given during ovulation are plotted on x-axis.

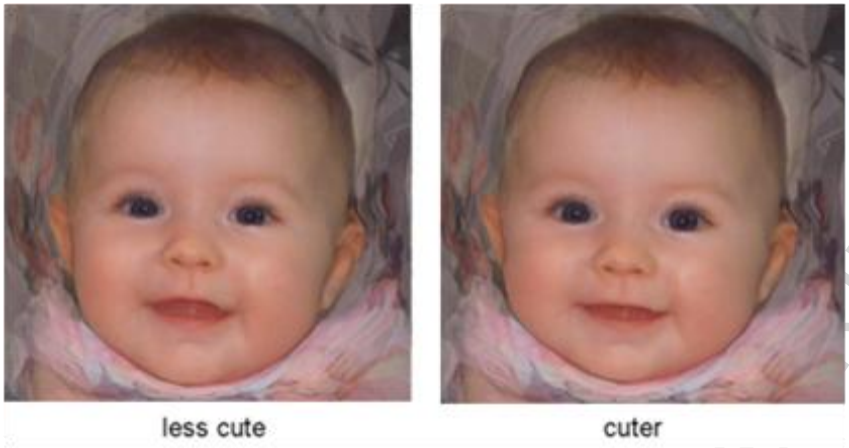


Figure 1



Menstrual cycle affects perception of infant faces

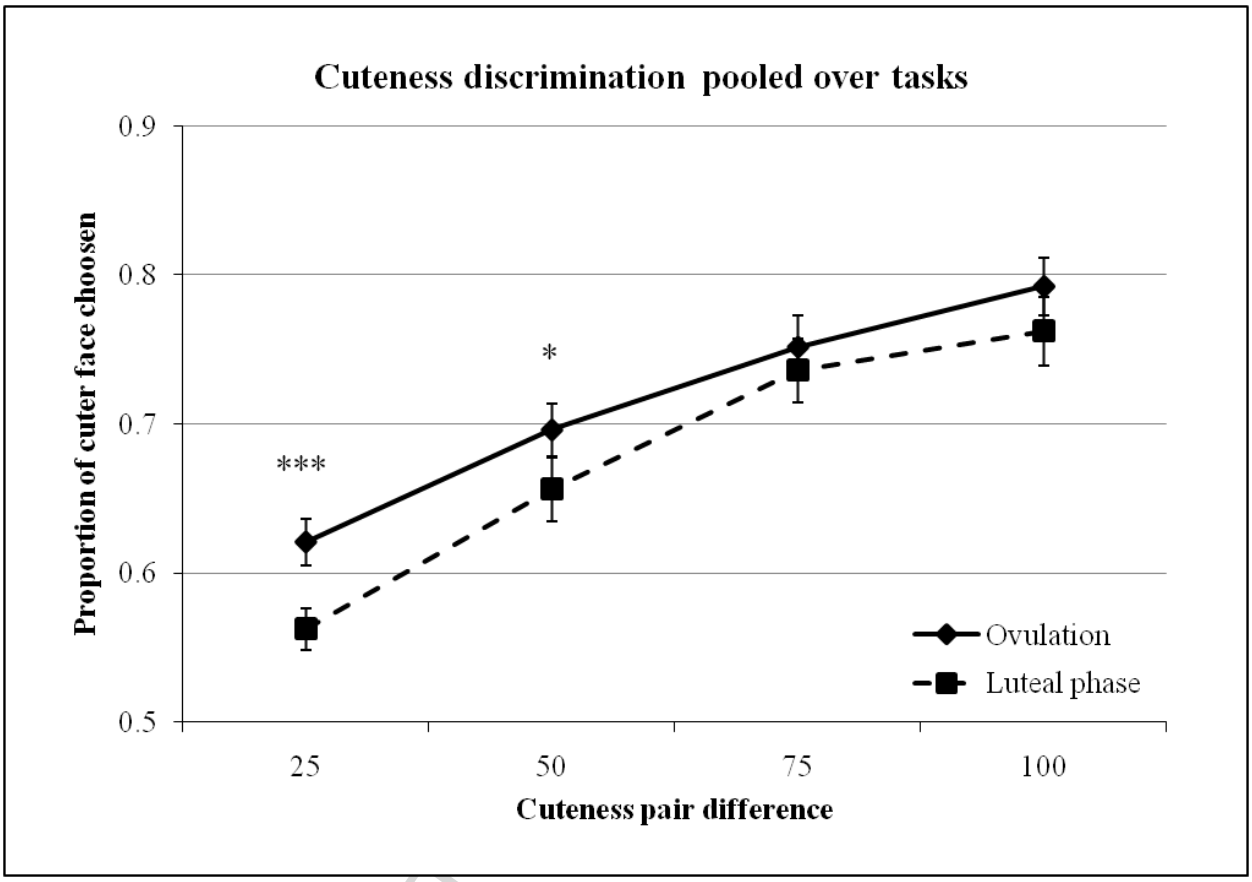


Figure 2



Menstrual cycle affects perception of infant faces

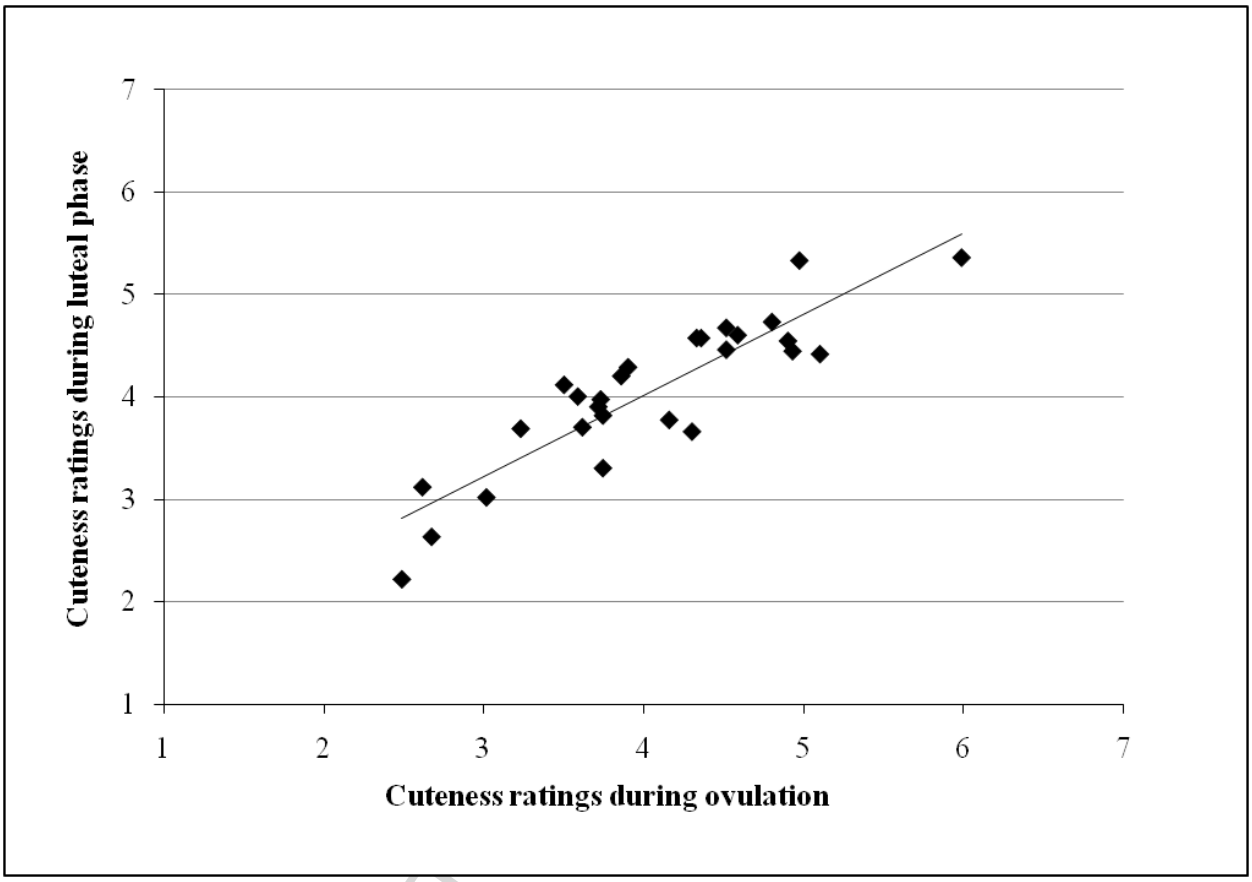


Figure 3



Menstrual cycle affects perception of infant faces

Highlights

- We compared young women's sensitivity to baby faces varying in cuteness
- Each woman was tested during ovulation and during the luteal phase
- During ovulation women were more sensitive to cuteness differences
- No relation between estradiol, progesterone or testosterone was found
- We suggest that oxytocin and prolactin may increase cuteness sensitivity



Menstrual cycle affects perception of infant faces