

“Porn” and Ovulation: A Winning Combination?

Molly Brown and Caitlin Gorman

Faculty Sponsor: Betsy L. Morgan, Department of Psychology

ABSTRACT

This study explored the relationship between hormonal state and perceived attraction to symmetry while adding a priming condition. Participants consisted of 57 undergraduate females ranging in age from 18 to 25 years old. The majority of participants were on some form of hormonal birth control ($n = 38$). Participants were randomly assigned to an experimental condition where they viewed a prime of a sexual video clip (2:43min) or a control group with a neutral (2:26min) clip from an R-rated movie. Participants rated ten black and white photos (shown for 5 seconds each) of males morphed with software to be symmetrical. Although our data did not yield any significant relationship between priming condition, hormonal status, and ratings of attractiveness, our findings were in the direction of our initial hypothesis. A larger sample may have yielded a significant relationship.

INTRODUCTION

Variation in species relies on sexual reproduction and genetic recombinations. Consequently, both biologists and psychologists have studied factors associated with mate selection in animals and humans. What makes a partner attractive to another? In the purest sense, attractiveness is defined as the value a partner has as a sexual stimulus for another (Tarin & Gomez-Piquer, 2002). However, research on humans suggests that many psychological factors are associated with perceptions of attractiveness such as likeability (i.e. warmth and agreeableness) and perceived similarity (Gangestad, 2004). Rhodes (2005) found that three main factors influence biologically-based preferences regarding facial attractiveness - averageness, symmetry, and sexual dimorphism. She defined averageness as having “mathematically average trait values for a population”, symmetry as the extent to which features on one side of a person’s face correspond directly with the opposing features, and sexual dimorphism as the degree to which a person’s face is considered to be either masculine or feminine. The current study explored the relationship between hormonal state and perceived attraction to symmetry.

Biological Predictors of Attractiveness

Findings on facial symmetry and others regarding biological determinants of mate selection are a component of a growing interest in the area of evolutionary psychology. This branch of psychology focuses on identifying factors that help to increase the success of reproduction. In particular, evolutionary psychologists focus on psychological mechanisms that concern aspects of successful reproduction, such as attraction and mate selection (Kenyon, 2000). Studies have shown that men who have more facial symmetry are more likely to mate successfully and have greater chances of engaging in sexual activity than men who have asymmetrical faces (Gangestad & Thornhill, 1997; Moller & Thornhill, 1997; Thornhill & Gangestad, 1994). Women, it seems, find men who have facial symmetry, thin lips, and square jaws to be significantly more attractive than men who do not (Keating 1985). Therefore, the men who women perceive as more attractive will more likely be chosen as a mating partner and have an increased likelihood of their genetic traits being passed on to potential offspring.

Another line of research focuses on women’s ovulation patterns and their relationship to perceptions of men’s attractiveness. Unlike many other animals such as female baboons and chimpanzees, human female ovulation is concealed (Dixson, 1983). Though ovulation may be hidden, researchers believe that subtle cues such as body odor may send out signals to males that the female is at her peak time of fertility (Poran, 1994; Singh & Bronstad 2001). Women’s facial attractiveness also seems to increase around ovulation. Roberts, et al. (2004) had men pick the most attractive picture between two pictures of the same woman. One picture was taken at the follicular phase (the first 1-13/14 days of the menstrual cycle) while the other was taken during the luteal phase (postovulatory phase). Though the mean effect size was small, the study found that men rated women more attractive around the time of the follicular phase rather than the luteal phase. Fluctuating hormones also can affect how women perceive attractiveness during different times of the menstrual cycle. Jones, et al. (2004) studied the effect of the menstrual cycle on attraction to healthy faces. In this study, healthy faces were a reflection of a healthy immune system. Attraction to healthy faces was much stronger during the luteal phase of the menstrual cycle (less than 14 days until

the start of the period) then any other time during a woman's cycle. Penton-Voak et al. (1999) speculated that women might be more sexually selective during this time of the cycle because it is the best time to acquire desirable genes for future children. Indeed, the menstrual cycle also affects commitment to relationships such that relationship commitment and happiness for women was highest during high estrogen times such as the luteal phase (Jones, et al., 2005).

Advances in human medicine have made the study of hormonal cycling more complicated because many more women now take oral hormones as birth control or hormonal replacement. Over 100 million women worldwide use of oral contraceptives reporting usage of this method since 2000 (The John Hopkins School of Public Health, 2000). The two forms of synthetic hormones found in oral contraceptives prevent ovulation, thicken cervical mucus, and prevent fertilization of the egg (U.S. Food and Drug Administration, 2003). Generally speaking, synthetic hormones in birth control pills create a level of estrogen and progesterone (or just progesterone) high enough to keep the body from ovulating and therefore also provide a more consistent hormonal experience than the variations found in naturally cycling women.

Jones et al (2004) conducted a study in which they compared ratings of apparent health in male faces between naturally cycling women and women using oral contraception. They found that women using oral contraceptives had a stronger reported attraction to male faces with apparent health than naturally cycling women. This could be attributed to the raised progesterone levels women using oral contraceptives are exposed to. Similarly, Koehler, Rhodes & Simmons (2002) conducted a study comparing ratings of attraction with participants who were both naturally cycling and on oral contraceptives. The interest at hand was how ratings of attraction would differ when presented with varying levels of facial symmetry; ranging from low to perfect in a series of four pictures of the same male. Findings showed that a preference for symmetry was found in both groups of participants, although the hypothesized cyclic increase in attractiveness ratings in pill users was not found to be significant. This research validated past research in this area, supporting models of preference evolution and evolutionary psychology.

Cognitive Priming

In order to explore additional factors that may influence perceptions of attractiveness, the current study involved the addition of a priming event where half of the participants will review sexual material prior to ratings attractiveness in faces. Recognition, judgments, and decision making are often influenced by priming. Cognitive psychologists attribute instant decision making based on environmental stimuli to the concept of priming (Hermans et al., 2001). Most of the priming research has been on semantic primes (or word primes) on words recognition. For instance, participants shown a subliminal prime such as the word "red" were more likely to remember the word "apple" at a later time. However, in recent years, priming has been studied for other psychological outcomes such as perception and decision making. Brotanek and Kayson (1996) primed men with words of either a positive or negative personality traits and asked them to rate the attractiveness of a neutral description of a fictitious female. Their findings suggested that relevant primes affected attractiveness ratings more than irrelevant primes. Also, ratings of attraction increased with negative relevant primes but not positive relevant primes. This study illustrates the implications priming effects have on social judgments like attraction.

The processes of priming described above concern subliminal, unconscious priming. There is another type of priming used in the science of psychology dealing with conscious awareness of the prime, or supraliminal priming. The prime presented to participants of an experiment will be received consciously, but with no seeming relation to the task that follows the primes presentation (Stajkovic, Locker, & Blair, 2006). Two types of supraliminal primes commonly used are subtle primes and overt primes. If subtle priming is used, a participant receives a prime designed to activate an individual's attitudes or thoughts toward a particular subject (Kuhnen & Hannover, 2000).

The relationship between priming and attitude and behavioral outcomes is important to investigate in the area of sexual attraction. Mass media bombards the public with sexual images and innuendos and researchers need to more fully understand some of the more subtle effects this overt sexuality may be triggering. For instance, American adolescents will on average view 14,000 sexual images in a given year (National Coalition for the Protection of Children & Families, n.d.). For television media alone, the number of sexual images has doubled since 1998, with 70% of shows containing at minimum 5 sexual scenes per hour (Kaiser Family Foundation, 2006).

The current study explored the relationship between menstrual phases and attraction while adding a priming condition. Specifically, the effects of subtle conscious priming were investigated in regard to ratings of perceived attraction during different stages of the menstrual cycle. We anticipated that the highest ratings of attraction in participants primed with sexual material who are naturally cycling and in a stage of the menstrual cycle with the highest progesterone levels. We also expected a difference between the mean scores of ratings of attractiveness between participants who are naturally cycling and those using hormone variants such that naturally cycling women

would produce higher ratings. A higher fluctuation of attractiveness ratings was expected among naturally cycling ovulating women in comparison to participants using hormone variants.

METHOD

Participants

Participants were obtained using a voluntary sign-up process and consisted of 57 undergraduate females ranging in age from 18 to 25 years old. Participants received extra credit for participation and informed consent was obtained prior to the study. Upon arrival, participants were asked to fill out a demographics survey asking the participant's age, major, regular or irregular cycle, dates of last menstruation (onset and end), and any form of birth control used. The majority of participants were on some form of hormonal birth control ($n=38$).

Procedure

Participants were randomly assigned to an experimental condition where they viewed a sexual video clip (2:43min) or a control group with a neutral (2:26min) clip from an R-rated movie. Each participant then rated ten pictures of males morphed with software to be symmetrical on attractiveness using a seven point scale anchored at 1 (extremely unattractive) and 7 (extremely attractive). Each slide was shown for 5 seconds and participants were allowed that time to complete the ratings. Naturally cycling participants (e.g. not using hormonal birth control) were categorized into high or low hormonal levels using the Koehler, Rhodes, & Simmons' (2002) scheme where 12-15 days past the first day of the last menstrual period indicates high hormonal levels and all others low. Due to the high number of participants on birth control, very few were naturally cycling. Of naturally cycling women, nine participants were in the high hormonal or ovulating category based on their reports of their last menstrual period.

RESULTS

We anticipated that the participants primed with sexual material who were naturally cycling would rate the male photo graphs as more attractive than the other participants. This hypothesis was not supported. We also expected that participants who were naturally cycling would rate the pictures as more attractive than did women on hormones. This hypothesis was also not supported. Table 1 shows the results of our data. Contrary to our hypothesis, no main effects for hormonal condition or priming were found. The photos were rated most attractive by naturally cycling ovulating women but with a sample too small to yield a significant effect - less than 20% of the sample were not on hormonal birth control and ovulating at the time of data collection. When analyzing the effect of the sexual prime on those participants currently on birth control ($n = 38$) the findings were not significant ($p = .20$) but were in the expected direction where those primed rated the photos as more attractive than those who were received the neutral prime. The data also suggest a non-significant trend that sexually active women (once or more a month) viewed the stimulus pictures as less attractive than did the less sexually active women (every 3 months or less) regardless of hormonal state.

Table 1. 2X3 Factorial ANOVA Results

| | Hormonal Birth Control | Naturally cycling – High Hormonal Levels | Naturally Cycling – Low Hormonal Levels | Total |
|---------------|------------------------------------------|------------------------------------------|------------------------------------------|------------------------------------------|
| Sexual Prime | $M = 3.65$ ($SD = .77$) $n = 28$ | $M = 4.00$ ($SD = .42$) $n = 2$ | $M = 3.30$ ($SD = .39$) $n = 6$ | $M = 3.60$ ($SD = .72$) $n = 36$ |
| Neutral Prime | $M = 3.32$ ($SD = .41$) $n = 10$ | $M = 3.80$ ($SD = .42$) $n = 2$ | $M = 3.67$ ($SD = .55$) $n = 9$ | $M = 3.51$ ($SD = .49$) $n = 21$ |
| Total | $M = 3.57$ ($SD = .70$) $n = 38$ | $M = 4.03$ ($SD = .37$) $n = 4$ | $M = 3.51$ ($SD = .52$) $n = 15$ | |

Note – Ratings are the mean ratings across ten slides of symmetrical male faces on a 1-7 scale where 7 is high attractiveness.

DISCUSSION

Although our data did not yield any significant relationship between priming condition, hormonal status and ratings of attractiveness, our findings were in the direction of our initial hypothesis. A larger sample may have yielded a significant relationship.

The number of participants on birth control greatly reduced the number of participants in each cell. All of the photos of the men were manipulated to be symmetrical. It is possible that using photos with higher variation in both attractiveness and symmetry would have yielded stronger results in the expected direction. Alternatively, the expected finding may be less evident in college participants due to the high level of interaction with single available men. However, research on the preference for symmetrical faces at ovulation has been established. Our sample was also restricted in terms of generalizability. The vast majority of participants were white, well-educated individuals residing in a mid-sized Midwestern town.

Further investigation on the relationship between priming, attitudes, and behavioral outcomes is important to investigate in the area of sexual attraction. Sexual images are a frequent and regular feature of mass media (Kaiser Family Foundation, 2006) and researchers need to more fully understand some of the more subtle effects this overt sexuality may be triggering. Further research in this area may lend credence to empirical support for the impact of media exposure.

Although unrelated to the primary analysis associated with this study, it is also of interest to note the negative correlation between frequency of sexual activity and ratings of attraction. This finding is worth exploring on its own right as women with little to no sexual activity may respond more favorably to attractiveness and/or women with access to sexual partners may be more “discerning” in their ratings of attractiveness. Another implication of the findings is that future researchers may need to include sexual activity potential confounding variable in attractiveness research.

Overall, the theories and hypotheses of this study are worthy of additional research with larger samples. Research continues to provide evidence that ovulation in women is related to mate-finding related behavior. For instance, Haselton, Mortezaie, Pillsworth, Bleske-Recheck, and Frederick (2007) found that ovulating women engaging in more grooming and ornamentation than menstruating women. Research on the biological and situation factors influencing the ratings of attractiveness can inform both evolutionary and social psychology.

REFERENCES

- Brotanek, T., & Kayson, W. A. (1996). Effects of type and relevancy of primes and delay between priming and ratings on attractiveness. *Psychological Reports, 78*, 1251-1255.
- Dixon, A. F., (1983). Observations on the evolution and behavioural significance of ‘sexual skin’ in female primates [Electronic version]. *Advances in the Study of Behavior, 13*, 63-106.
- Gangestad, S. W., Simpson, J. A., Cousins, A. J., Garver-Apgar, C.E., & Christensen, P. N., (2004). Women’s preferences for male behavioral displays change across the menstrual cycle. *Psychological Science, 15*(3). 203–207.
- Gangestad, S. W., & Thornhill, R., (1997). The evolutionary psychology of extrapair sex: The role of fluctuating asymmetry [Electronic version]. *Evolution and Human Behavior, 18*, 69-88.
- Haselton, M. G., Mortezaie, M., Pillsworth, E. G., Bleske-Recheck, A. E., & Frederick, D. A. (2007). Ovulation and human female ornamentation: Near ovulation, women dress to impress. *Hormones and Behavior, 51*, 41-45.
- Hermans, D., Eelen, P., Houwer, J. D. (2001). A time course analysis of the affective priming effect. *Cognition and Emotion, 15*, 143-165.
- Jones, B.C., Little, C.A., Boothroyd, L., et al. (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 [Electronic version]. *Hormones and behavior, 48* (3), 283-294.
- Jones, B. C., Perrett, D. I., Little, A. C., Boothroyd, L., Cornwell, R. E., & Feinberg, D. R. et al. (2004). Menstrual cycle, pregnancy and oral contraceptive use alter attraction to apparent health in faces [Electronic version]. *Proceedings of the Royal Society of London B, 272*, 347-354.
- Keating, C. F., (1985). Gender and the physiognomy of dominance and attractiveness [Electronic version]. *Social Psychology Quarterly, 48*, 61-70.
- Kenyon, C. A. P. (2000). Evolutionary Psychology. Retrieved February 20th, 2006 from University of Plymouth – Department of Psychology.
- Koehler, N., Rhodes, G., & Simmons, L. W. (2002). Are human female face preferences for symmetrical male faces enhanced when conception is likely? *Animal Behavior, 64*, 233-238.

- Kuhnen, U. & Hannover, B. (2000). Assimilation and contrast in social comparisons as a consequence of self-construal activation. *European Journal of Psychology*, 30, 799-811.
- Moller, A. P., & Thornhill, R., (1997). Bilateral symmetry and sexual selection: A meta analysis [Electronic version]. *American Naturalist*, 151, 174-192.
- National Coalition for the Protection of Children & Families (n.d.). Parenting – sex & media statistics. Retrieved March 1, 2006, from <http://www.nationalcoalition.org/parenting/mediastats.html>.
- Penton-Voak, I. S., Perrett, D I., Castles, D. L., Kobayashi, T., Burt, D.M., Murray, L. K., & Minamisawa, R., (1999). Menstrual cycle alters face preference [Electronic version]. *Nature*, 399, 741-742.
- Poran, N.S., (1994). Cyclic attractivity of human female odors [Electronic version]. *Advances in the Biosciences*, 93, 555-560.
- Rhodes, G. (2005). The evolutionary psychology of beauty [Electronic version]. *Annual Review of Psychology*, 57, 199-226.
- Roberts, S. C., Javlicek, J., Flegr, J., Hruskova, M., Little, A.C., Jones, B.C., Perrett, D. I., & Petrie, M., (2004). Female facial attractiveness increases during the fertile phase of the menstrual cycle [Electronic version]. *Proceedings of the Royal Society of London, B*, 271, 270-272.
- Singh, D. & Bronstad, P. M., (2001). Female body odour is a potential cue to ovulation [Electronic version]. *Proceedings of the Royal Society of London, B*, 268, 797-801.
- Stajkovic, A. D., Locker, E. A., & Blair, E. S. (2006) A first examination of the relationships between primed subconscious goals, assigned conscious goals, and task performance [Electronic Version]. *Journal of Applied Psychology*, 91, 1172-1180.
- Tarin, J. J., & Gomez-Piquer, V., (2002). Do women have a hidden heat period [Electronic version]? *Human Reproduction*, 17 (9), 2243-2248.
- The Henry J. Kaiser Family Foundation (2006). *Sex on TV 4*. Retrieved March 1, 2006, from <http://www.kff.org/entmedia/entmedia110905pkg.cfm>.
- The John Hopkins School of Public Health (2000, Spring). *Oral Contraceptives*. Retrieved on March 6, 2006, from <http://www.infoforhealth.org/pr/a9edsum.shtml>.
- Thornhill, R., & Gangestad, S. W., (1994). Human fluctuating asymmetry and sexual behavior. *Psychological Science*, 5, 297-302.
- United States Food and Drug Administration (2003, December). Birth Control Guide. Retrieved March 1, 2006, from <http://www.fda.gov/fdac/features/1997/babytabl.html>.