Perceptions across the Menstrual Cycle: Attentiveness to Sexual Orientation

An honors thesis for the Department of Psychology

Katherine S. Rosen

Tufts University, 2010.

Abstract

The present study was performed to determine whether or not ovulating women show enhanced memory for, and better categorization of, straight and gay male faces when compared to that of menstruating women. Thirty undergraduate women were tested on two occasions, during ovulation and menstruation. On each occasion participants were presented with a series of straight and gay male faces. Following a filler task, participants were presented with both the original and new faces, and asked to respond to whether or not they remembered having seen each face before, and whether they believed that male to be straight or gay. Both ovulating and menstruating women showed better memory for straight faces. The present work introduces judgments of targets' sexual orientations as a novel variable in the field of menstrual cycle research, and discusses future research considerations and directions pertaining to social perception across the menstrual cycle.

Perceptions across the Menstrual Cycle: Attentiveness to Sexual Orientation

Today there are many alternatives to attracting a mate, from online match-making to speed dating. However, ongoing research has indicated that women's mate preferences may be influenced simply by one of their most basic bodily functions: the menstrual cycle. Given our complex social world, it is of benefit to understand how hormonal factors take a role not only in women's mate preferences, but in their overall social perceptions as well.

Across the menstrual cycle, women's perceptions of males and females have been researched on a variety of dimensions. Women at periods of high fertility presented with faces and stereotyped words of both genders have categorized the male faces, as well as classified the stereotype-matching 'male' words, faster compared to periods of non-fertility (Macrae, Alnwick, Milne, & Schloerscheidt, 2002). Also in periods of high fertility, women have demonstrated increased race bias in implicit evaluation, implicit stereotyping, mate attraction, and fear of male targets (Navarrete, Fessler, Fleishman, & Geyer, 2009). Women around ovulation (the point of high fertility), have higher salivary testosterone levels and prefer masculinized faces (Welling et al., 2007), as well as find masculine walkers, who demonstrate a larger upper body lateral sway compared to females, more attractive (Provost, Troje, & Quinsey, 2008). These patterns reveal that women are in fact disposed to making varying social judgments, depending on their menstrual cycle status. As such, researchers have questioned whether this relates to an inherent gathering of reproductively-relevant, or alternatively, sexually-relevant information.

The good genes hypothesis predicts that women at their most fertile should prefer men with supposed indicators of male genetic benefits (e.g., high levels of testosterone, muscularity, displays of assertion). In effect, fertile women ought to be most attuned to this reproductively-relevant information so as to receive such genetic benefits for offspring. In a study by Gangestad, Garver-Apgar, Simpson, and Cousins (2007), women with high conception risk preferred men who appeared 'masculine': more confrontational, arrogant, muscular, socially respected, and physically attractive. Similarly, women at periods of high fertility have shown peaks in sexual desire (Hill 1988) and increased incidents of sexual activity (Harvey 1987), compared to periods of non-fertility. Brinsmead-Stockham, Johnston, Miles, and Macrae (2008) even found that lesbian participants were faster to identify female, not male, faces during periods of high fertility.

Collectively, this research on women's perceptions across the menstrual cycle has often been manipulated using stimuli such as male versus female faces for categorization, or the presentation of masculine traits and behaviors along a spectrum. However, little research has examined women's attentiveness to this information using stimuli related to sexual orientation. Regardless of whether for reproductively- or sexually-relevant information, it would seem that fertile women might be better attuned to perceiving homosexuality and heterosexuality in terms of mate preference, compared to when they are non-fertile.

Surprisingly, people tend to have an extremely keen sense of the sexual orientations of others, from a quite limited range of social cues. Previous work has shown that sexual orientation can be judged accurately from video clips showing brief exposures

of expressive behaviors (Ambady, Hallahan, & Conner, 1999). Additionally, similar work has found accurate sexual orientation judgment to be true for still images depicting only the face for both males (Rule & Ambady, 2008) and females (Rule, Ambady, & Hallett, 2009), even when they are viewed as briefly as 40 milliseconds. These instances of research have determined that the ability to correctly classify sexual orientation falls above chance levels. In that case, even from very limited social information about potential mates, women can be expected at the least to judge sexual orientation at above chance levels, fertile or not.

If fertile women do show increased attentiveness to the perception of sexual orientation, this finding expands upon previous knowledge related to women's tendencies during bodily fluctuations of the menstrual cycle. The present investigation is designed to manipulate the perception of sexual orientation across the menstrual cycle. The following study examines female participants' memory for, and categorization of, gay and straight male faces at varying points during their menstrual cycles. We predict that both memory and categorization ability will be enhanced when participants are at periods of high fertility (i.e., around ovulation), compared to when they are not. Both effects would suggest that fertile women potentially seeking reproductive and/or sexual benefits are better attuned to the sexual orientations of others.

Method

Participants

Forty-five female college students participated for monetary compensation. Four of these women did not participate for both sessions of testing, and 11 were not at the required point in their menstrual cycle during one of the sessions, leaving a total of 30 women to be included in the repeated measures analyses (M_{age} =19.3 years, SD = 1.24). Participants were volunteers responding to an advertisement posted on the university's activities webpage. All participants reported no use of oral contraceptives or hormonal birth control.

Stimuli

The images were of 80 gay and 80 straight men downloaded from public, online personal advertisements posted for use in major cities across the U.S. (excluding the local geographic area). Only photos of headshots from the 18-30 age group were used. The men in the images had self-defined their sexual orientations. These men were anonymous and available to the public domain. For anonymity and privacy reasons, targets' sexual orientations were not shared with participants. From the hundreds of images originally collected, just those posting a forward-facing image free of alterations (e.g., piercings or facial hair) were chosen. All images were taken from their original setting and placed on a white background. Targets' necks were cropped, while ears and hair were kept. All images were gray-scaled and sized to 3" x 5" in dimension (see Figure 1). From the total collection of 175 homosexual and 175 heterosexual images, 80 images were randomly chosen from each target group for the study at hand. Being a repeated measures design,

forty of the images from each target group were used for one version of the study (A), while the remaining forty were used for another (B).

Procedure

Prior to testing, potential participants were questioned about their average menstrual cycle length and the date of last and next menses. For women who reported a regular menstrual cycle, a testing schedule was arranged so that during her cycle a participant was to be tested once during a period of high fertility (i.e., around ovulation) and once during a period of low fertility (i.e., during menstruation). These periods were calculated using a similar counting method introduced by Jöchle (1973) and implemented in previous research (Brinsmead-Stockham et al., 2008; Macrae et al., 2002). As such, a period of high fertility comprised the day of ovulation and the 2 preceding days; a period of low fertility comprised the days a participant was menstruating. Order of testing sessions was randomized across participants.

Stage 1. Upon entering the laboratory, participants were seated before a computer screen. Images were presented using DirectRT data collection software (Jarvis, 2006). The first set of instructions stated that participants were to passively view a series of photographs of faces on the screen that they would be asked about later. In random order, 40 images (20 gay, 20 straight) were presented individually for 3,000 ms. Before each image, participants viewed a 500 ms blank screen and a 500 ms fixation cross to alert them that the next image was forthcoming.

Stage 2. After the initial encoding, the next set of instructions asked participants to work on a word-search puzzle placed next to the computer for the next three minutes. Each participant received the same puzzle, and its content bore no relation to the

experiment. This was a filler-task, designed to prevent recency effects whereby participants might recognize faces better that they had just seen; thus, the filler-task was of sufficient length to clear the participants' visual working memory. After three minutes, the computer screen flashed alerting participants that their time was up, and they were given a new set of instructions.

Stage 3. Participants were asked to use the "G" and "H" keys of the computer's keyboard to choose, by press of either key, whether they remembered having seen the face in the first part of the experiment ("G" = seen before; "H" = not seen before). Participants were requested to respond as quickly as possible. To decrease error and confusion, a reminder of key assignment was placed below each image on the computer screen. During this portion, participants were presented with 80 faces (40 previously presented targets, 40 new targets) in random order. The assignment of faces for the encoding phase was counterbalanced across participants in both the first and second experimental sessions. Specifically, half of the participants viewed gay and straight images 1-20 as targets during the encoding portion (stage 1), while the other half saw gay and straight images 21-40 as targets during the encoding portion.

Stage 4. After completing the memory portion, the final set of instructions asked participants to identify the sexual orientations of the men whose faces had been previously viewed. Participants were asked to base their decision on what "most people" or "society" might label the person presented. Participants were instructed to respond by press of the "Z" (gay) and "/" (straight) keys of the computer's keyboard. Again they were requested to respond as quickly as possible. Upon completion, participants were questioned about their own sexual orientations with the option of choosing not to

respond. Finally, participants were debriefed, compensated, and scheduled for their second session.

Stage 5. The second session proceeded in the exact manner as the first. Stages 1-4 were repeated, however if a participant was shown version A during her first session, she was shown version B with 80 new faces (or conversely, version A if she was shown version B first). Participants were also given a new word-search puzzle during the filler task.

Results

The first dependent measure of interest was memory for the men's faces. The data for memory were analyzed on three levels. 'Actual memory' described participants' actual hit (correctly remembered) and false alarm (falsely remembered) rates of the faces. 'Perceived memory' described hit and false alarm rates based upon each individual participant's perceived judgment of the men's sexual orientations. 'Corrected memory' described hit and false alarm rates only including those faces that participants accurately categorized as gay and straight during Stage 4. Each analysis produced two pairs of hit and false alarm rates, one for the gay images and one for the straight images.

Actual Memory

Frequencies for hit and false alarm rates of the faces were calculated using the *d'* statistic for signal-detection (see Table 1 for rates). These *d'* scores were then used for repeated measures ANOVA with participant menstrual cycle status (ovulating or menstruating) as a within-subjects factor and image sexual orientation as a two-level repeated measure. Results showed a main effect of image sexual orientation, in that straight men were remembered better by both ovulating and menstruating participants

[$F(1, 29) = 5.16$, $p < .05$, $r = .38$; see Figure 2]. It has been previously shown that, among men, participant sexual orientation and image sexual orientation reveals an ingroup enhancement for memory of faces perceived as belonging to one's sexual orientation ingroup (Rule, Ambady, Adams, & Macrae, 2007). Thus, the presence of an ingroup effect for the heterosexual majority of participants is not surprising. However, ovulating participants showed no difference in memory ability compared to menstruating participants [$F(1, 29) = 1.97$, $p = .17$, $r = .25$].

Perceived Memory

Accuracy rates are higher in judging facial cues of race (Richeson & Trawalter, 2005) and gender (Macrae & Martin, 2007), when compared to judging sexual orientation (Rule et al., 2007). Due to this hindrance, participants' memory ability was also examined based upon their perceptions of the men's sexual orientations. Again, frequencies for hit and false alarm rates were computed into *d'* scores and analyzed using repeated measures ANOVA with participant menstrual cycle status as a within-subjects factor and image sexual orientation as a two-level repeated measure. There was no main effect for memory based on menstrual cycle status [$F(1, 29) = 0.60$, $p = .45$, $r = .14$], or for memory of image sexual orientation [$F(1, 29) = 0.58$, $p = .45$, $r = .14$]. Thus, even taking into consideration the effect a participant's perceptions of the men's sexual orientations may have had upon her memory, a significant difference in recognizing gay and straight men's faces did not emerge (see Figure 3).

Corrected Memory

The above analyses may (a) reflect the high number of errors upon judging sexual orientation, and (b) contain the tendency for participants to label target faces as like

themselves. As such, this final analysis took into account participants' accuracy in categorizing the men's sexual orientations. We included only the responses to images that participants labeled correctly as gay and straight. For instance, if a participant correctly labeled 15 targets as gay and 25 targets as straight, only these 40 responses would be included in the analysis of hit (previously shown) and false alarm (not shown) rates from her data in Stage 4. These rates were again computed into *d'* scores and applied to repeated measures ANOVA including the same factors of menstrual cycle status and image orientation. Results mirrored the above analysis, with no main effect for menstrual cycle status [$F(1, 29) = 2.47$, $p = .13$, $r = .28$] or image sexual orientation [$F(1, 29) = 1.04$, $p = .32$, $r = .19$; see Figure 4].

Sexual Orientation

The second dependent variable of interest was ability to correctly categorize sexual orientation (from the images) as gay or straight. Responses from Stage 4 were generated into accuracy rates, and then frequencies of hit and false alarm rates were calculated using the *d*' statistic (see Table 2). Using the *d'* scores, repeated measures ANOVA was used with participant menstrual cycle status as a within-subjects factor. Menstrual cycle status did not significantly affect participants' ability to categorize gay and straight faces, [$F(1, 29) < .01$, $p = .97$, $r = .01$]. However, accuracy was significantly greater than chance guessing for both ovulating [$t(29) = 4.09$, $p < .001$, $r = .60$] and menstruating [$t(29) = 4.50$, $p < .001$, $r = .64$] women.

Discussion

This investigation attempted to introduce a novel variable, sexual orientation, to the preexisting plethora of research on women's varying perceptions across the menstrual

cycle. Using a within subjects design, we tried to determine whether there was a significant difference between ovulating and menstruating women and their perceptions of male sexual orientation using faces. Our findings do not support the original hypothesis: despite examining three modes of memory—actual, perceived, and corrected—ovulating women were not better than menstruating women at remembering the straight versus gay men's faces, nor were they better at categorizing them.

Work in the field of evolutionary psychology has indicated that the mind is responsive to physical markers that will improve people's odds of reproductive success (Thornhill & Gangestad, 1996). Thus, women at the point of high-conception risk during the menstrual cycle would likely be better attuned to information benefitting their own reproductive success. Immunity is one such benefit, and apparent masculinity in men (deep voice, muscularity, facial hair, etc.) is believed to signal greater heritable immunity to disease (see Gangestad & Simpson, 2000, for review). Indeed, prior studies have consistently found that ovulating women do show the most attentiveness to cues of masculinity, compared to any other point in the menstrual cycle (see Jones et al., 2008, for review). In the case of our present study, then, it was reasonable to predict that ovulating women would bear resemblance to this body of previous research, on the assumption that it would be of benefit to their fertile status to be more attentive to male sexual orientation.

Initially, our consistent lack of significance in ovulating women's enhanced memory for, and categorization of, the faces was surprising considering the abovementioned trends in past research. If the seeking of reproductively-relevant information during ovulation guided perception during this study, some sort of memory

enhancement or categorization ability ought to have been evident. Even a seeking of sexually-relevant information would have yielded similar results, because discerning sexual orientation would be crucial in determining a sexual partner and women are likely to be more interested in sex outside of menstruation. In order to be certain of this lack of significance, it was especially important that three different modes of memory analyses were performed. Nonetheless, in accepting that no significance was found in line with our hypothesis on any account, the resolve is to look to potential alternative explanations for the results at hand.

It must be recalled that in the instance of Brinsmead-Stockham et al.'s (2008) previously-mentioned research, the notion that fertile women could actually be seeking sexually-relevant information was new and contrary to the established idea that fertile women behave according to the evolutionary perspective of enhancing their reproductive success. Brinsmead-Stockham et al.'s (2008) deliberate separation of straight and lesbian participants, and their subsequent differing results, challenged the expectation that females have evolved as a sex to orient themselves to reproductively-relevant information during times of peak fertility. In a similar light, our study's utilization of sexual orientation as a novel variable ought not to be expected to have results that necessarily fit the evolutionary psychology mold described either.

With the aforementioned sexually-relevant perspective in mind, the single significant finding from our study was that both ovulating and menstruating participants' actual memory was better for the straight men's faces. Given that 26 of the 30 participants reported being exclusively heterosexual, heightened attentiveness to the straight faces could be connected to the gathering of sexually-relevant information, just

not necessarily contingent on menstrual cycle status. While past research has found increased sexual desire (Hill, 1988) and activity (Harvey, 1987) to occur around ovulation, specifically, it is possible that the mere *gathering* of sexually-relevant information, not necessarily intended to be used for sexual encounters, can occur across ovulation and menstruation, explaining our finding. On the other hand, it is possible that at present we have encountered an entirely new trend in examining perceptions across the menstrual cycle, not related to reproductively- or sexually-relevant information at all.

Though not statistically significant, it is worth mentioning that across all three memory analyses it was the *menstruating* women that showed slightly enhanced memory for the gay and straight faces (see Figures 2-4), which stands in direct opposition to the original hypothesis. Taking into consideration a woman's bodily experience during menstruation, and the social taboos surrounding it, it is possible that this experience plays a differing role in enhancing women's sensitivity to certain social perceptions. Instead of heightened sensitivity to reproductive or sexual information around ovulation, perhaps there is an alternative prevailing sensitivity occurring during menstruation. Weideger (1976, pp. 1-2) states: "We are ashamed of menstruation and menopause, we are taught to hide all evidence of its existence, and we come to believe that there is something in the experience that is 'wrong.'" During menstruation, women might show behaviors and make perceptions that either (a) support keeping their menstruating status a secret, or (b) reveal shame at the thought that a member of the opposite sex has been made aware of their menstruating status. For example, when menstruating women believed that a male interviewer had been made aware that they were menstruating, they felt they were viewed less favorably, and were less motivated to manage the impressions made on him, as

compared to non-menstruating women (Kowalski & Chapple, 2000). Perhaps when prompted with male faces, the menstruating women of our study were more attentive to these stimuli (thereby enhancing their memory), a result of sensitivity to their menstruating status.

Overall, given the weight of non-significant findings from this study, an aspect of particular interest is the potentially impeding limitations. First, the external validity of not merely this study, but of the entire body of research seeking to examine fertile and non-fertile women across the menstrual cycle, is called into question. Typical designs involve social perceptions of males that have been placed, or have been manipulated so as to be placed, across a spectrum of 'masculinity.' Whether measured by straight and gay faces (current work), testosterone levels (Gray, Kahlenberg, Barrett, Lipson, & Ellison, 2002), walking type (Provost et al., 2008), or displays of behavior (Gangestad, Simpson, Cousins, Garver-Apgar, & Christensen, 2004) among others, the operational definition of masculinity is arbitrary, and cannot possibly encompass a single archetype of how others perceive masculinity in the natural environment. This becomes ever necessary to bear in mind at present, as societal expectations for what is considered masculine and feminine is becoming more fluid (Twenge, 1997). Moreover, the hypothesis of this study assumed that female mating strategies when gathering reproductively- or sexually-relevant information are largely based upon their sensitivity to degrees of masculinity, when strategies are likely to involve a variety of social factors. It also assumed that any mating strategy is dependent on menstrual cycle status, a factor that is biologically-based. In the highly complex human social environment, supposing a biological basis of female behavior alone is especially controversial.

Next, there are aspects of the study population to consider. Although the population was a random sample of the university population, there is still the limitation of selection bias. All participants were of similar status as undergraduate students attending a private, well-funded institution. Moreover, to avoid confounds, all participants were non-hormonal contraceptive users, which could have been a small subset of the population compared to the hormonal contraceptive use norm in young women on college campuses today. Another drawback is the reliance on participants' self-reports of menstrual cycle status, and the subsequent calculations of cycle status based on Jöchle's (1973) counting method. Given the absence of resources to perform hormonal assays verifying participants' precise position in their menstrual cycles, our estimates are only so reliable. Finally, a repeated measures design carries its own drawbacks on the study population as well. Participants were required on two separate occasions to repeatedly respond to whether they remembered a face, and whether they believed that male to be straight or gay. Collectively, the nature of the tasks holds potential not only for fatigue, but also demand characteristics in which participants may have begun to grasp the true nature of the study's examination of sexual orientation as its variable.

As an initial look into the role that judgments of sexual orientation play during ovulation and menstruation, the present study succeeded in carrying out new research related to the topic of the menstrual cycle. While no difference across the menstrual cycle was found in this case, there are certainly future directions to be taken while maintaining use of the variable of sexual orientation. For one, it would be of benefit to determine whether lesbian participants might also show better memory for the straight faces as a

means to verify whether heterosexual participants were in fact remembering the straight faces as an attempt to gather sexually-relevant information or not. Changing the nature of the task could also be sensible; for instance, asking about short-term and long-term mating preferences or personal attraction upon images of straight and gay men at different points in the menstrual cycle. No matter the direction taken, it is clear that there is much potential for discovery upon any investigation of the menstrual cycle and sexual orientation, two prevalent and ever-changing elements of the modern social arena.

References

Ambady, N., Hallahan, M., & Conner, B. (1999). Accuracy of judgments of sexual orientation from thin slices of behavior. *Journal of Personality & Social Psychology, 77*, 538-547.

Brinsmead-Stockham, K., Johnston, L., Miles, L., & Macrae, C. N. (2008). Female sexual orientation and menstrual influences on person perception. *Journal of Experimental Social Psychology, 44,* 729-734.

Gangestad, S. W., & Simpson, J. A. (2000). The evolution of human mating: Trade-offs and strategic pluralism. *Behavioral and Brain Sciences, 23,* 573-644.

Gangestad, S. W., 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,* 203-207.

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,* 151-163.

Gray, P. B., Kahlenberg, S. M, Barrett, E. S., Lipson, S. F., & Ellison, P. T. (2002). Marriage and fatherhood are associated with lower testosterone in males. *Evolution & Human Behavior, 23,* 193-201.

Harvey, S. M. (1987). Female sexual behavior: Fluctuations during the menstrual cycle. *Journal of Psychosomatic Research, 31,* 101-110.

Hill, E. M. (1988). The menstrual cycle and components of human sexual behavior. *Journal of Social Biological Structures, 11,* 443-455.

Jarvis, B. G. (2006). DirectRT. Version (2006.2.0.28). [Computer Software]. New York, NY: Empirisoft Corporation.

Jöchle, W. (1973). Coitus induced ovulation. *Contraception, 7*, 523-564.

Jones, B. C., DeBruine, L. M., Perrett, D. I., Little, A. C., Feinberg, D. R., & Law Smith, M. J. (2008). Effects of menstrual cycle phase on face preferences. *Archives of Sexual Behavior, 37,* 78-84.

Kowalski, R. M, & Chapple, T. (2000). The social stigma of menstruation. *Psychology of Women Quarterly, 24,* 74-80.

Macrae, C. N., Alnwick, K. A., Milne, A. B., & Schloerscheidt, A. M. (2002). Person perception across the menstrual cycle: Hormonal influences on social-cognitive functioning. *Psychological Science, 13,* 532-536.

Macrae, C. N., & Martin, D. (2007). A boy primed Sue: Feature-based processing and person construal. *European Journal of Social Psychology*, *37*, 793–805.

Navarrete, C. D., Fessler D. M. T., Fleishman, D. S., & Geyer, J. (2009). Race bias tracks conception risk across the menstrual cycle. *Psychological Science, 20,* 661-665.

Provost, M. P., Troje, N. F., & Quinsey, V. L. (2008). Short-term mating strategies and attraction to masculinity in point-light walkers. *Evolution and Human Behavior, 29,* 65-69.

Richeson, J. A., & Trawalter, S. (2005). On the categorization of admired and disliked exemplars of admired and disliked racial groups. *Journal of Personality and Social Psychology*, *89*, 517–530.

Rule, N. O., Ambady, N., Adams, R. B., Jr., & Macrae, C. N. (2007). Us and them: Memory advantages in perceptually ambiguous groups. *Psychonomic Bulletin & Review, 14,* 687-692.

Rule, N. O., & Ambady, N. (2008). Brief exposures: Male sexual orientation is accurately perceived at 50 ms. *Journal of Experimental Social Psychology, 44,* 1100-1105.

Rule, N. O., Ambady, N., & Hallett, K. C. (2009). Female sexual orientation is perceived accurately, rapidly, and automatically from the face and its features. *Journal of Experimental Social Psychology, 45*, 1245-1251.

Thornhill, R., & Gangestad, S. W. (1996). The evolution of human sexuality. *Trends in Ecological Evolution, 11,* 98-102.

Twenge, J. M. (1997). Changes in masculine and feminine traits over time: A meta-analysis. *Sex Roles, 36*, 305-325.

Weideger, P. (1976). *Menstruation and menopause.* New York: Knopf.

Welling, L. L. M., Jones, B. C., DeBruine, L. M., Conway, C. A., Law Smith, M. J., Little, A. C., Feinberg, D. R., Sharp, M. A., & Al-Dujaili, E. A. S. (2007). Raised salivary testosterone in women is associated with increased attraction to masculine faces. *Hormones and Behavior, 52,* 156-161.

Author Note

Katherine S. Rosen, Department of Psychology, Tufts University.

I would like to thank Nicholas Rule for his primary role as an inspiring mentor through this research, and for providing the editing commentary on this work. I would also like to thank Nalini Ambady for the opportunity to utilize her Interpersonal Perception and Communication Laboratory to conduct this research, as well as all of the volunteers who participated in the study. Funds for participant payment were provided by a National Science Foundation Graduate Research Fellowship to Nicholas O. Rule.

Correspondence concerning this article should be addressed to Katherine Rosen, c/o Nalini Ambady, PhD., Department of Psychology, Tufts University, 490 Boston Avenue, Medford, MA, 02155. Email: Katherinesrose@gmail.com

Table 1

Mean Hit (Remembered) and False Alarm (Falsely Remembered) Frequencies of Gay and Straight Images by Participants when Ovulating and Menstruating for Three Memory Analyses

		Images			
		Gay		Straight	
Memory Analysis	Participant Cycle Status	H	FA	H	FA
Actual	Ovulating	.54	.15	.50	.10
	Menstruating	.58	.16	.57	.09
Perceived	Ovulating	.30	.07	.23	.06
	Menstruating	.31	.08	.27	.06
Corrected	Ovulating	.55	.14	.45	.10
	Menstruating	.60	.18	.55	.10

Table 2

d' Scores for the Categorization of Sexual Orientation by Ovulating and Menstruating Participants in Stage 4 of the Experiment

	Participants	
	Ovulating	Menstruating
d'	.35	.38
SD	.47	.44

Figure Captions

Figure 1. Example of modified gay (left) and straight (right) target images used as stimuli, originally retrieved from online personal advertisements.

Figure 2. Means and standard errors for *d*' scores based on participants' actual memory for gay and straight male faces at times of ovulation and menstruation.

Figure 3. Means and standard errors for *d*' scores based on participants' memory for male faces perceived as gay or straight at times of ovulation and menstruation.

Figure 4. Means and standard errors for *d*' scores based on participants' memory for male faces accurately identified as gay and straight at times of ovulation and menstruation.

FIGURE 1

FIGURE 2

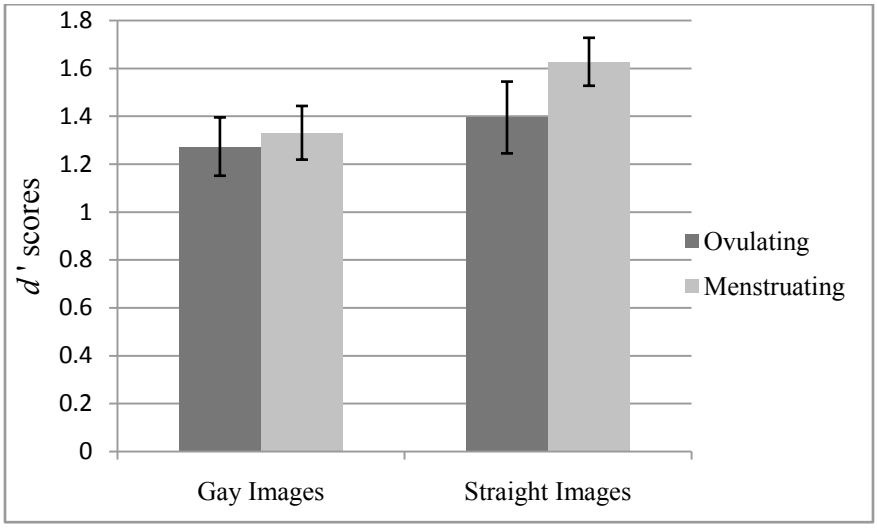

1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
d' scores
Ovulating
Menstruating
Gay Images
Straight Images

FIGURE 3

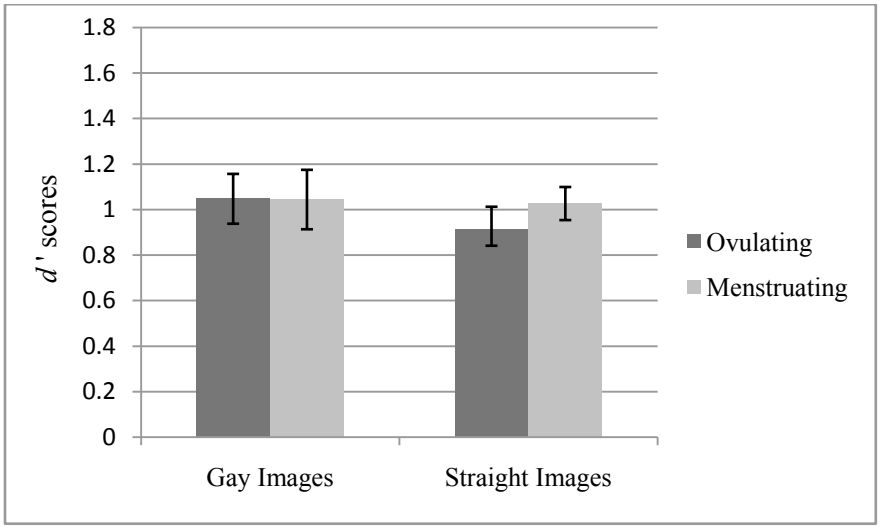
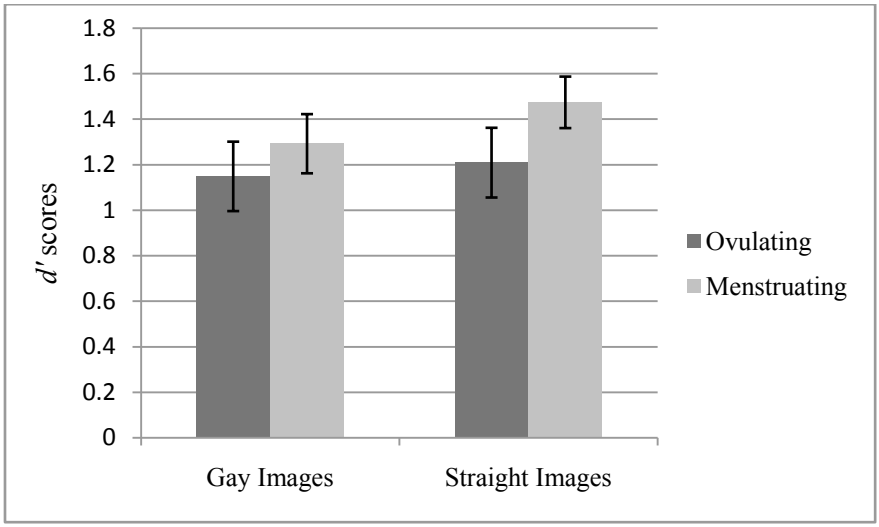

1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
d' scores
Gay Images
Straight Images
Ovulating
Menstruating

FIGURE 4


1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
d' scores
Gay Images
Straight Images
Ovulating
Menstruating