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# The Effects of Sexually Appealing Male Models and Ovulatory Cycle on Ad Preference and Attitude of Female Consumers

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## Abstract

This article seeks to create more insight in the use of sexually appealing male models in advertising by investigating gender effects on ad preferences. Furthermore, it explores the effects of menstrual cycle phase on female ad preference and attitude. A simple experimental design where respondents were asked to choose between and rate real-life advertisements, was executed. Univariate analysis of variance was used to analyze the data and it was found that women exhibit a greater preference than men for ads with sexually appealing male models. Moreover, the results indicate that fertile women have more favorable attitudes than non-fertile women towards ads with a particular type of male models possessing 'good genes indicators'. These findings expand existing literature concerning sexual appeals in advertising and ovulatory effects on female behavior and provide marketers and managers with insights in the reactions of female consumers to sexually appealing models in advertising.

# 1. Introduction

Advertisers continuously are seeking for means to, on the one hand, draw attention of consumers to their ads in order to break through the clutter of commercial advertisements and, on the other hand, to have them to like the advertisements and, hopefully, the advertised brand. One of the most controversial instruments of marketers to draw attention to their ads and evoke affective responses is the use of sexual appeals. It is interesting to apply evolutionary concepts to fully understand what these appeals intrinsically are and why such strong affective responses typically are induced (Belch, Holgerson, Belch, & Koppman, 1982). We use evolution theory to rigorously define the concept of attractiveness and identify differential mating strategies amongst males and females. This leads to the interesting hypothesis which states that the attention to, and perception of an advertisement or brand will be dependent on the phase of the menstrual cycle of a female.

# 2. Literature review male attractiveness in advertising

## 2.1 Prevalence of sexual appeals in advertisements

Research concerning the prevalence of sexual appeals in advertising suggests a frequent use of suggestive models to accompany a product and brand. A study about the use of sex in magazine advertising (Reichert & Carpenter, 2004) reports that, in 2003, almost half of the women were portrayed suggestively and that this number had increased nearly 10 percent over the previous decade. Compared to ads for mature people, ads which target a young audience are 65 percent more likely to contain provocatively dressed models and 128 percent more likely to display sexual behavior (Reichert, 2003). The same study indicates that women are depicted sexually almost four times more often than men.

### 2.2 Effects of sexual appeals on ad and brand attention

One of the most important motives for a marketer to use sexually appealing models in their ads might be to draw the attention of consumers to their ad, product and brand. In a cluttered environment, the most challenging task of the marketer is to get the consumers to pay attention to the ad and the use of explicit, sexual content is thought to be an effective way to do this. Empirical evidence for the success of this approach is lacking. Severn et al. (1993) found that sexy ads evoked more ad-execution related thoughts than non-sexy ads, which could be interpreted as enlarged attention. However, external validity of this approach to measure attention is low since it uses forced exposure. A more effective technique to measure attention could include the use of eye-tracking devices.

### 2.3 Effects on ad attitude, brand attitude, purchase intention and brand recall

Bearing in mind worldwide criticism (for example, suggestive ads are claimed to objectify females and can be perceived as offensive) and tendencies to regulation (Boddewyn, 1991) of the use of explicit material in an advertising context, it is reasonable to question to what extent sexual contents positively contribute to advertisement evaluations. Male and female respondents rated an advertisement as being more appealing, attractive, impressive and eye-catching if an attractive model was presented with the product compared to an unattractive model and the effect was stronger if it concerned a model of the opposite sex (Baker & Churchill, 1977). Moreover, the authors manipulated product type by electing products with and without romantic overtones but no significant product effect was found. Note that attractiveness was manipulated, not sexual explicitness. Another study, conducted by Severn et al. (1993), found that advertisements with an explicitly sexually appealing model were evaluated as more favorable, interesting, original and offensive compared to ads not containing a model at all. Furthermore, a study which examined psychophysiological and

cognitive responses to sex in advertising (Belch, Holgerson, Belch, & Koppman, 1982) reported strong physiological reactions to sexual content in advertising. Ads containing same-sex models were negatively evaluated but those presenting opposite-sex models were positively assessed. These findings indicate that explicit, sexual content should be used only if well-adapted to the targeted audience.

Garner (1985) conducted a research to test the hypothesis that positive ad evaluations carry over to brand attitudes. It was found that, both under a brand evaluation set and a non-brand evaluation set, brand attitudes were enhanced by favorable advertisement attitudes. A review about specific research concerning the effects of sexual appeals on brand attitude reports a positive effect of sexual content on brand attitude (Reichert, 2002). However, the effect appears to be less strong than the effect on advertising attitude.

In some of the consulted research, purchase intention was measured as well. Severn et al. (1993) reported an increased purchase intention when a respondent was shown a sexually appealing model and purchase intention was correlated to attitudes towards the ad. Baker and Churchill (1977) did not find a significant main effect of sexual appeals on behavioral intentions. The measure of purchase intentions in these experiments, however, might not be externally valid since it is hard to force respondents to make a real-life like decision. To cope with this problem, research that imitates a real market situation, for example a test supermarket, is necessary.

The effectiveness of sex in advertising is often doubted by referring to research that indicates a reduced brand recall when sexual appeals are used. The first study to investigate this phenomenon suggested that brand names which were accompanied by sexual illustrations were less easily recalled than those not associated with sexy illustrations (Steadman, 1969). In addition to this finding, it was shown that copy point recall was diminished by adding a sexy

model in an ad (Severn et al., 1990). Moreover, ads containing a mountain resulted in more brand recalls than those depicting a nude female (Alexander & Judd Jr., 1978).

**2.4 Gender effects**

Since our study focuses on effects of sexual appeals on females, it is interesting to explore the body of research conducted concerning gender effects of sexual appeals in advertising. A well-supported finding is the interaction effect between sex of the respondent and sex of the sexy model, meaning that an ad containing an opposite-sex model is rated more favorably, especially on affective measures (Jones, Stanaland, & Gelb, 1998; Baker & Churchill, 1977). Latour (1990) found that, when exposed to female nudity in advertising, women were more likely to be 'tension aroused', negatively evaluated arousal, while men were more likely to be 'energy aroused', arousal related to positive feelings. Furthermore, female physiological reactions to suggestiveness, not nudity, are much stronger than those of men (Belch et al., 1982). Also, women were found to react most favorably to half-naked males, not naked ones (Simpson, Horton , & Brown, 1996). Finally, women seem to respond more favorably to sexual appeals in advertising when there is a strong fit between the ad and the brand, while men seem to respond favorably irrespective of such a fit (Putrevu, 2008).

In conclusion, we could say there is substantial evidence to justify sexual appeals in advertisements from the point of view of the advertiser. However, additional research about the effects of sexual contents on consumer attention is required to fully understand the impact. An important disadvantage suggested in literature is the adverse effect of sexual content on brand recall. However, this research used only a 'one time exposure' so external validity was rather poor. Based on the consulted literature, it would be advised to use a 'softer' approach and a fit between ad and brand when the target audience is female.

Reichert and Ramirez (2000) pursued to find a rigorous definition for sexually oriented appeals and found physical features of the model like clothing, physique, and general attractiveness to be important aspects to define a sexually oriented appeal, as well as behavior and movement, intimacy between models and contextual features such as camera effects. Both men and women often mentioned physical features, while women mentioned contextual features and intimacy between models more often. In this study we approach sexual attractiveness by using evolutionary concepts to be able to manipulate attractiveness in a more effective way and to understand better the gender differences in the reactions to sexually appealing advertisements.

**2.5 Psychological explanations for the effect of sexual appeals on brand attention and attitude**

In literature, there are several possible psychological explanations provided to account for the effects of sexual appeals on brand and ad attitude and attention to the advertisement. The Elaboration Likelihood Model of Persuasion (Cacioppo & Petty, 1984) suggests an increased importance of peripheral cues, such as endorser attractiveness, in a low-involvement situation. In a high-involvement environment, on the contrary, product relevant information is more important to persuade consumers. Petty et al. (1983) found similar effects manipulating product endorser by including a celebrity or not (the model predicts similar effects for a manipulation of attractiveness).

The concept of classical conditioning as well has been used to explain how favorable brand attitudes could be formed on the basis of classically conditioned cues (Stuart, Shimp, & Engle, 1987). Classical conditioning suggests that pairing a stimulus that provokes an innate, often reflexive reaction (the unconditioned stimulus) with a neutral stimulus (the conditioned stimulus) results in an association between these two stimuli. Hence, the behavioral reaction will be carried over to the conditioned stimulus. In the light of our subject, this means that a

sexual appeal which is supposed to take along positive feelings would be the unconditioned stimulus and the brand name would be the conditioned stimulus. Hence, the positive affect provoked by a sexual appeal should be carried over to the brand name. While the study of Stuart et al. (1987) investigated the effects of classical conditioning on attitudes, this concept is also applied to consumer attention. It is shown that conditioning procedures enhance consumer attention to the conditioned brand in subsequent product displays (Janiszewski & Warlop, 1993).

## 3. Literature review evolutionary approach to sexual attractiveness

In this paper we deal with sexually appealing models which positively or negatively affect attention and/or attitudes with respect to an advertisement or brand. As mentioned earlier, Reichert and Ramirez (2000) offered a 'receiver-based' definition of sexual oriented appeals. Such a definition, however, does not provide a satisfying insight in what exactly is physical attractiveness, nor does it provide an explanation of the reported gender differences. This is why we want to provide a thorough explanation of what sexual attractiveness means in evolutionary terms. Using evolutionary constructs to explain consumer behavior has proven to yield some very interesting insights (for an overview, in Dutch, see Mark Nelissen, 2004) and a recent research which is in line with the one at hand, explored the effects of hormonal fluctuations associated with the ovulation on product choices of females (Durante, Griskevicius, Hill, Perilloux, & Li, 2011) and found that fertile women (normally cycling women near ovulation) chose more products that enhance appearance.

A considerable part of human behavior can be explained using evolutionary psychological concepts. Evolutionary psychology states that, like our body, our brains are evolved over time to adapt optimally to the circumstances the human being was faced with during the history of the species (Saad, 2004). Also mating strategy and mate preferences seem to be at least

partially prone to evolutionary adaptations and at least some preferences are genetically predestinate since babies already display preferences for attractive faces (Langlois, Ritter, Roggman, & Vaughn, 1991). Gender differences in mating preferences are believed to originate in sex-specific functions in conception and parental care of offspring (Betzig, Mulder, & Turke, 1988).

### 3.1 Differential reproductive costs and benefits between males and females

Biologically speaking, the cost of conception for men and woman differ substantially. Men are able to fertilize a lot of women in a short time span, the only cost being the loss of energy in the process. This ability provides them with an incentive to copulate with as much as possible females, the only constraint being the limitedness of energy. Females, however, carry the burden of pregnancy which is a huge biological cost. Not only does it cost a lot of energy, there is a substantial health risk which only has diminished in the last centuries for some regions. These costs impose an incentive on females to carefully choose their partners in terms of genetic and care-providing qualities (Trivers, 1972). In general, there is created a situation where males have to compete for the limited resource of possible female conception.

### 3.2 Female physical attractiveness

As this study focuses on male models, we do not strive for an exhaustive overview of female attractiveness research. We provide some important examples which easily can be linked to our evolution theoretical approach. For men, to reproduce, their sexual partners have to be fertile. Hence, evolution theory would predict male preferences to be adapted in such way that fertile women are chosen above non-fertile women. A study (Buss, 1989) which investigated sex differences in human mating preferences in 37 cultures, found that vast majority of men all over the world are attracted to young women. This can be declared by the evolutionary hypothesis above since women between age 20 and 24 are in their most fertile period. Waist-

to-hip ratio (WHR) is shown to be an important indicator of female attractiveness and ideally amounts a value of 0.7 (Furnham, Dias, & McClelland, 1998; Singh & Young, "Body Weight, Waist-to-Hip Ratio, Breasts, and Hips: Role in Judgments of Female Attractiveness and Desirability for Relationships", 1995). Interestingly, Zaadstra et al. (1993) found a negative correlation between WHR and likelihood to conceive. Jasienska et al. (2004) found a negative correlation between WHP and daily levels of 17-β-oestradiol (E2) and progesterone which are indicators of success of pregnancy. Furthermore, men are generally attracted to women with fine jaws, big eyes, high cheekbones, a small nose, full lips and a small lower chin, all of which indicate fertility (Yu & Shepard, Jr, 1993). A rough skin is rated as unattractive in women since it can point on high testosterone levels which can indicate low fertility (Wolfe, 2000).

**3.3 Male physical attractiveness**

Since women bear a substantial biological cost in generating offspring, it is logical that they will be more careful when choosing potential mates. They also rate long-term qualities as a caretaker of higher importance than men. Here, we focus on physical attributes of men which signal quality of genes as stated in the 'good genes sexual selection theory' (for a review see Gangestad, 2007). In the evolutionary approach of attractiveness, fluctuating asymmetry (FA) plays an important role as an indicator of genetic quality and as a predictor of attractiveness. Fluctuating asymmetry is measured by the deviation of perfect bilateral symmetry of morphological traits (Van Valen, 1962). FA is correlated to genetic quality as low FA points on a low exposure or low susceptibility to environmental difficulties such as toxins or infections in pre- and postnatal development (Parsons, 1990; Polak & Trivers, 1994). Mealey et al. (1999) conducted a research using identical twins to investigate symmetry on perceived attractiveness. It was found that the more symmetric co-twin was significantly rated as more attractive and that more symmetrical twins were rated more attractive than less symmetrical

twins. These findings indicate that both developmental and genotypic differences account for variation of symmetry and thus attractiveness. Grammer and Thornhill (1994) as well found a correlation between symmetry and perceived attractiveness. FA also appears to correlate negatively to reproductive success. Self-reported age of first copulation correlates positively and lifetime number of sex partner correlates negatively to fluctuating asymmetry. These findings suggest that evolution shaped female preferences in such a way that women are more physically attracted to symmetrical men.

The study of Grammer and Thornhill (1994) not only suggests a positive effect of symmetry on perceived attractiveness, but also a correlation between largeness of secondary facial traits such as jaws, chin and cheekbones, and rated attractiveness. Androgens and estrogens influence facial secondary traits in puberty. Note that both types of hormones influence the development of each sex's traits, but the ratio is dependent on sex. In men, high values of male hormones result in growth of lower face and jaw, cheekbones and brow ridges, and projection of the central face between the brow and bottom of the nose while relatively high values of female hormones prevent this development, but increase lip size. Small secondary traits in women are perceived as attractive because they signal youth and fertility as estrogen values in women decrease with age. On the contrary, high values of testosterone are correlated to size of secondary traits which are developed in puberty under the influence of this hormone, and large secondary traits are perceived as attractive in men (Thornhill & Gangestad, 1996).

These findings suggest that facial traits are an indicator of testosterone levels during puberty, but do not account for a reason why an enhanced ratio of testosterone and estrogen in puberty, thus enlarged secondary facial traits, would be an interesting asset for ancestral males in the competition for females. First of all, testosterone is responsible for developing a child into a sexual mature male. Hence, these traits provide information about gender and sexual maturity

which are essential in signaling possible mating candidates. Secondly, testosterone is showed to lower immunocompetence, so only healthy males have been able to survive such a handicap. This means that enlarged secondary facial traits advertise health in males and therefore are indicators of good genes (Folstad & Karter, 1992). Finally, high levels of endogenous testosterone are correlated to dominant behavior, which is behavior to enhance one's social status (Mazur & Booth, "Testosterone and Dominance in Men", 1998). Sadalla et al. (1987) found that men, portrayed as dominant, were perceived as more attractive but not more likable. Moreover, dominant-looking males are reported to copulate earlier (Mazur, Halpern, & Udry, 1994). Since high testosterone levels during puberty enlarge secondary facial traits and enhance dominant behavior, which is reported to be attractive, these facial traits could signal dominant males and therefore attractiveness.

Another measure related to physical attractiveness is the Body Mass Index (BMI) (Maisey, Vale, Cornelissen, & Tovée, 1999). It does not differ between men and women, but the distribution of fat and the amount of muscle are gender-dependent. This could be explained by the fact that the male body is adapted to the male ancestral activities such as hunting (Barber, 1995). Muscle mass was important to exert work but too much muscle mass could be detrimental on long hunting trips since muscle is very energy absorbing. This could be why bodybuilders are generally not rated as very attractive. Hönekopp et al. (2006) established a relationship between physical fitness and body attractiveness in aggregated and individual analysis. Rated body masculinity was a mediating factor between physical fitness and body attractiveness and the latter mediated physical fitness en self-reported, lifetime number of sex partners. In addition to findings about the importance of WHR in women, this aspect of the body was investigated for men as well and results indicate an optimal value of WHR of 0.9. Female-like WHR of 0.7 were rated as most unattractive in males (Singh & Young, "Body Weight, Waist-to-Hip Ratio, Breasts, and Hips: Role in Judgments of Female Attractiveness

and Desirability for Relationships", 1995). Maisey et al. (1999), however, did not find WHR to be a significant predictor of male attractiveness ratings. They found waist-to-chest (WCR) ratio to be the most important variable, followed by body mass index (BMI). Height, as well, is shown to be a possible indicator of attractiveness (Shepperd & Strathman, 1989). A possible explanation is that height is correlated positively to testosterone levels and negatively to FA (Heald, Ivison, Anderson, Cruickshank, Laing, & Gibson, 2003). Women prefer dating men who are taller than themselves and date those men more often but do not rate these dates as more attractive. Interestingly, males are rated as more attractive when they are depicted as being tall, standing next to a smaller woman (Shepperd & Strathman, 1989).

These good genes indicators are just one aspect of male attractiveness in general. It is shown that not only mature features such as prominent cheekbones and a large chin are indicators of facial, male attractiveness but also neotenous features (indicating nurturing feelings) such as large eyes and expressive features like a big smile. Furthermore, high-status-clothing contributed to perceived attractiveness (Cunningham, Barbee, & Pike, 1990). As mentioned before, women are expected to be more selective than men in choosing their partners. Women have an incentive to differentiate in mate choice with respect to long-term mating and short-term sexual encounters. This results in a ‘mixed mating strategy’ that values certain traits higher or lower depending on the situation, long versus short- term mating (for a review see Gangestad & Simpson, 2000). Since the advantages of short-term sexual encounters with males possessing good genes only are exploited in the case of a subsequent pregnancy, preferences for good genes indicators have adapted to be increasing near ovulation, when the probability of conception is highest.

### 3.4 Ovulatory shifts in preferences of women

The menstrual cycle starts on the first day of menstruation (day 1) and is divided into two parts, the follicular phase and the luteal phase, which are separated by the ovulation (normally around day 14). Fertility of women is highest around day 9 to 15 (e.g. Wilcox et al., 2001) and ovulatory shifts normally take place during this phase of the menstrual cycle.

Ovulatory shifts in preferences of women are found for a number of male traits, all of which occur only when men are evaluated as short-term partners. Compared to women in other phases, women in the follicular phase (day 9 until 15) of their menstrual cycle are proven to be more attracted to the scent of symmetrical men, measured by FA (Gangestad & Thornhill, 1998), and to the scent of more dominant men, measured by a questionnaire-based dominance scale, and this effect was much stronger for women in a stable relationship (Havlicek, Roberts, & Flegr, 2005). The latter can be explained in the framework of 'mixed mating strategies'. Women in a stable relationship have more incentives to invest energy in males who display cues of genes while single women have incentives to look for both good genes indicators and caregiving qualities. More masculine faces are more attractive to fertile women than to women in menses and luteal phases of their ovulatory cycle (Penton-Voak & Perrett, 2000) as well as deeper male voices (Puts, 2005). Fertile women also display, compared to non-fertile women, a preference for a greater sexual dimorphism in stature (SDS=male height/female height) between themselves and a potential mate (Pawlowski & Jasienska, 2005). Women in their ovulatory phase are also found to be more attracted to men displaying dominant behavior (Gangestad, Simpson, Cousins, Garver-Apgar, & Christensen, 2004) and prefer creativity over wealth (Haselton & Miller, 2006). Male traits which are seen as good genes indicators significantly attribute positively to male attractiveness when males are rated as short-term mates and this effect is stronger when rater's risk at conception is high (Gangestad, Garver-Apgar, Simpson, & Cousins, 2007). Furthermore, fertile women have greater interest in attending social gatherings where they might meet men, report greater

extra-pair flirtation, especially when their partner is rated as low on good genes indicators, and experience more mate-guarding by their partner, especially when these women are less attractive. Highly attractive women always experience high mate-guarding (Haselton & Gangestad, 2006).

When males are rated for long-term relationships, characteristics such as intelligence, qualities as a father, faithfulness, warmth and financial success are important to women and the attractiveness of such traits is not or negatively correlated to their risk of conception (Gangestad, Garver-Apgar, Simpson, & Cousins, 2007).

## 4. Hypotheses

In advertising literature possible beneficial effects of sexual appeals are well-documented. Sexual appeals appear to evoke affective responses which are transferred to the advertisement and brand attitude. Effects of sexual appeals on women are apparent, but gender differences exist. Evolutionary concepts were applied to get a thorough understanding of male attractiveness and found a variety of male, physical attributes that enhance attractiveness. Most of these attributes are so-called ‘good genes indicators’ and are more important to attractiveness ratings when the female who rates them is fertile. This phenomenon is explained by the concept of ‘mixed mating strategy’ which suggests that female preferences are adapted to pursue good genetic and care-giving qualities in males. Preferences of good genes indicators are argued to be adapted to be more important in the ovulatory, fertile period of the menstrual cycle and when males are rated as short-term mates.

Since women are argued to be more receptive to good genes indicators during their fertile period, an enhanced female consumer attention to sexual appeals in fertile women can be

expected. This study will also contribute to a caveat in advertising research by investigating the effect of sexual appeals on consumer attention in general. Therefore:

*Hypothesis 1: Ads presenting an attractive, sexually appealing male model will give rise to enhanced consumer attention of female respondents.*

*Hypothesis 2: Fertile women will display more attention to sexually appealing ads than non-fertile women.*

*Hypothesis 3: Compared to non-fertile women, fertile women will display more attention to advertisements presenting male models with good genes indicators.*

This research also seeks to investigate if the ovulatory cycle affects ad and brand attitudes. A positive effect of conception risk on ad and brand attitudes of sexually appealing ads is expected.

*Hypothesis 4: Fertile women rate sexually appealing ads (a) and the brands they advertise (b), more favorably than non-fertile women*

## 5. Method

### 5.1 Participants

To test hypothesis 1, a set of 321 participants was selected out of a total dataset of 794 respondents. Respondents who did not properly fill in the entire questionnaire and those who reported not being well motivated (less than 5 on a scale of ten) were excluded from the analyses. The remaining set consisted of 249 females and 69 males between 14 and 33 years old ($M$ = 17.6, $SD$ = 1.78). For the rest of the analyses a group of 67 female respondents was

selected out of this set and divided into 2 groups. The first group consists of 29 female respondents between 15 and 22 years old ($M$ = 16.79, $SD$ = 1.32) and was selected based on the fact that they reported not using hormonal contraceptives, nor medication based on hormones. Furthermore, they were selected to be either in the luteal or in the late follicular phase of their ovulatory cycle (see 5.2.2). Sixteen respondents were in their late follicular phase (fertile), 13 in their luteal phase (non-fertile). Participant for whom it was impossible to determine in which phase of the menstrual cycle they were, were excluded from the analyses. The second group consisted of 38 women between 15 and 22 years old ($M$ = 17.65, $SD$ = 1.34) who reported using hormonal contraceptives (all non-fertile) and they were also divided into a 'late follicular phase' group ($n$ = 22) and a 'luteal phase' group ( $n$= 16) based on which day in their menstrual cycle they were.

## 5.2 Procedure

### *5.2.1 The experiment*

First, the participants were asked to choose between two ads of the same brand by clicking on the one that appealed to them the most. Each respondent had to make 20 choices, 10 of which consisted of filler ads and thus were not of interest for our study. Second, they were asked for each advertisement of interest whether they had seen it before or not. Third, they were asked to rate the advertisements on a 7-point scale for five dimensions (nice, interesting, original, enjoyable and attractive) to measure their attitudes towards the ads (dimensions were partly selected from Severn et al. (1990) and completed with dimensions 'enjoyable' and 'attractive' since these could be relevant for this study). Fourth, brand attitude for the relevant brands was tested by asking to rate the brand on a 7-point scale for three dimensions (qualitative, interesting, and enjoyable) chosen based on relevance to the subject. At the end of the experiment the participants were asked to give some personal information such as gender,

age, information about whether or not they were single and information needed to estimate the phase in the menstrual cycle. Subjects were ensured of the anonymity of the survey before these personal questions were asked. To estimate the phase in the ovulatory cycle, questions were asked about the use of hormonal contraceptives and medication based on hormones, about whether participants currently had their periods, about start date (and number of days the real date could differ from the reported date) and end date of their current ovulatory cycle and about the typical duration of their cycle and periods.

### *5.2.2 Phase estimation*

For the analyses regarding hypotheses 2, 3 and 4, participants were divided into two groups based on the phase in their menstrual cycle. Women who reported a cycle length of less than 26 or more than 31 were excluded from the analyses. To estimate the day of ovulation, we used the Reverse Cycle Day (RCD) method which implies that the estimated day of ovulation is 15 days prior to the first day of the next cycle (see Haselton & Gangestad, 2006). Women who were on day 6-14 of their cycle (between 8 days before estimated ovulation and their estimated day of ovulation) were in the late follicular group. Women who had their periods and women who were on days 15, 16 and 28 (two days after ovulation and one day before start of the new cycle) of their cycle were excluded from the analyses, as well as women for whom it was impossible to estimate on which day in the cycle they were. The remaining women were in the luteal group (days 17-27 in a normal cycle) and were given the labe 'luteal'. These choices concerning ovulatory phases were chosen because they differ most from each other in hormone levels (progesterone and estrogen) and conception risk (DeBruine, Jones, & Perrett, 2005).

### *5.2.3 Attention measures*

Participants were asked to choose between two print ads and the time to make this decision was registered. The underlying assumption is that, if a respondent chooses an ad relatively quickly, this advertisement will attract more attention compared to the other ad. It is, however, difficult to rule out the possibility that actually ad liking instead of ad attention was measured. To test this assumption the average time before making the final choice was tested, as well as whether the ad attitude measure can predict choices between ads (see section 6).

### *5.2.4 Ad manipulation*

To test the first and second hypothesis, four pairs of existing ads were chosen. They were scaled to be equally large and all of them were converted into black and white pictures. Logos of brands were adjusted in such a way that within each pair, the same logo was displayed on both ads. Every pair consisted of an ad displaying a sexually appealing man and an ad using another technique to appeal to potential customers (for an example, see appendix A). The pairs were pretested with 23 females to check whether both ads could generate some interest in order to avoid a situation where all respondents choose a particular alternative. The six pairs of ads used to test hypotheses 3 and 4 were manipulated in the same way as described above. The only difference is the fact that each ad now contained a male model, selected and adjusted (using Photoshop CS5) in such a way that one of the ads presented a male model with good genes indicators and the other ad presented a good-looking man without these markers of good gene quality. Noses, cheekbones, lips, facial hair, eyes, jaw, length of lower face, WCR and brow ridges were manipulated to distinguish between the two models (for an example, see appendix B). Because of the fact that in reality, men with a high value of FA generally will not be models, we did not manipulate FA to enhance external validity of the findings. These pairs were pretested with 23 women to guarantee some level of ‘competition’ between these ads as well. The results of this pretest showed a minimum of interest for all ads.

Another pretest amongst 20 other women was run in which was asked to pick the most masculine man for each of the six pairs used to test hypotheses 3 and 4. For every pair, the majority of the respondents picked the man who was manipulated to be most masculine, though for 2 pairs the difference was not significant. It was concluded that the manipulations had been successful.

#### *5.2.5 Attitude measurements*

As mentioned before, ad attitude was measured using 7-point scales for five dimensions (nice, interesting, original, enjoyable and attractive) and brand attitude was measured using 7-point scales for three dimensions (qualitative, interesting, and enjoyable). For all attitude measures consistency between the dimensions was high (lowest Cronbach's alpha was 0.834) so sums of dimensions were calculated and used as attitude measurements.

To control for possible order effects, the rank order of the pairs of advertisements was randomized and for each pair, the position of the ads (left or right) was randomized as well. If not mentioned explicitly, controlling for relationship status (single vs. committed) did not substantially alter the results.

## 6. Results

To test the assumption that a quick choice between ads measures ad attention, not ad attitude, the average time before making the final choice was tested for both datasets used and it was tested whether the measures of ad attitude can predict choices between ads. For the first test, extreme cases which took more than 20 seconds per choice were excluded because this could point on having paused while taking the survey. For the dataset used to test hypothesis 1 it was found that, on average, respondents took about 8 seconds to choose ($M$ = 8.04, $SD$ = 4.00). For the dataset used to test the other hypotheses, the respondents took approximately 6 seconds ($M$ = 6.32, $SD$ = 3.46). Furthermore it was tested (independent samples t-test) how

well choices for an alternative predicted ad attitude measures for this advertisement. In the first dataset one out of four choices significantly ($p$ = .001) predicted attitudes towards the ads between which had to be chosen. For the remaining three pairs of ads, significance was not approached. In the second dataset one choice out of ten marginally significantly ($p$ = .066) and negatively predicted attitude scores and two choices approached significance to positively predict attitudes. However somewhat ambiguous, these results provide some support for the assumption that respondents chose relatively quickly and it is acceptable to state that a quick choice between ads does not merely measure attitude towards an ad.

### 6.1 Hypothesis 1

The first hypothesis predicts that ads displaying a sexually appealing male model will be chosen more often by women than by men. For the analysis of hypothesis 1, a one-way independent ANCOVA was performed with attitude measures for the alternative ads (ads not containing a sexually appealing male model) as covariates and gender as a factor. The rationale for this decision is that, if you want to measure the effect of an ad with an attractive man on choice of two groups between this ad and another one, the other ad should be liked equally by both groups. A clear effect of gender on choice for ads with sexually appealing male models was found ($F$(1,314) = 33.60, $p$ = .000). Women choose ads containing a sexually appealing male model significantly more often than men (figure 1). Therefore, hypothesis 1 can be accepted.

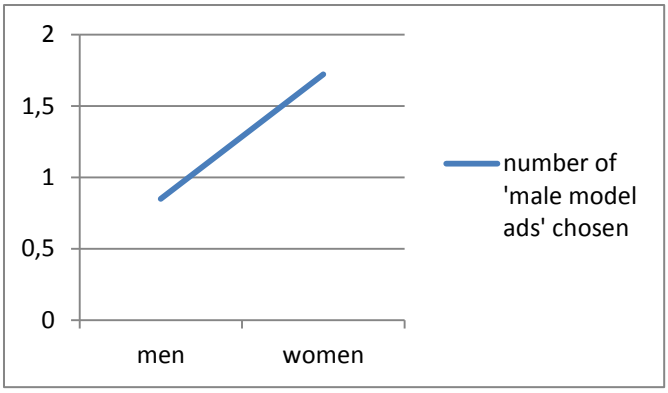



**Figure 1: effect of gender on choice for ads containg a sexually appealing male model (Y-axis represents number of ads with sexually appealing male model chosen, maximum = 2)**

### 6.2 Hypothesis 2

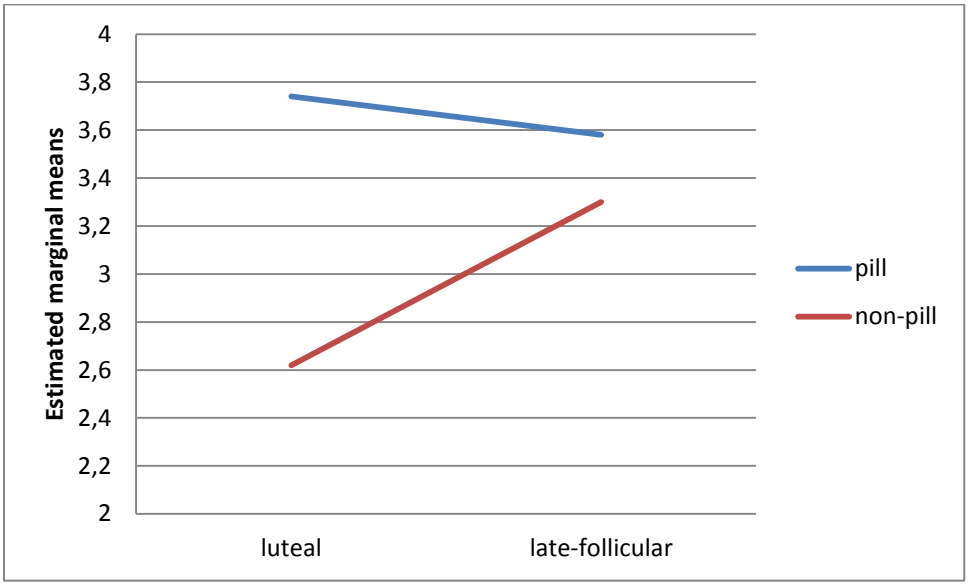
Hypothesis 2 predicts an effect of cycle phase on choice for the advertisement with sexually appealing model for non-pill-users. A variable which was formed by adding choices for the ad with a male model was created and used as dependent measure for choice of ads with a sexually appealing model. A two-way independent ANOVA was performed with use of hormonal contraceptives and cycle phase as independent variables. No main effect on choice of the independent measures 'use of hormonal contraceptives' ($F(1,63) = .72$, $p = .40$) or 'cycle phase' ($F(1,63) = .65$, $p = .42$), nor an interaction effect ($F(1,63) = .014$, $p = .91$) was found. Controlling for attitudes towards the alternative ads, nor for 'age' or 'relationship status' altered the results significantly. Based on this dataset, hypothesis 2 cannot be accepted.

### 6.3 Hypothesis 3

Hypothesis 3 predicts that, within the group of non-pill-users, the 'late follicular phase' group ('fertile') of women will choose more often for an ad with a man with good genes indicators (GGI) than the 'luteal phase' group ('non-fertile') of women and that this effect will not appear within the group of pill-users. Again, a new variable was created and used which is the total number of choices for ads with models possessing GGI (a score ranging from 0-6 for

each respondent). It was found that within the group of non-pill-users, fertile women chose ads with 'GGI-models' ($M$ = 3.38, $SD$ = 1.71) more often than non-fertile women ($M$= 2.62, $SD$ = 1.26) but this difference is not significant ($t(27) = -1.33$, $p = .19$). Furthermore, a three-way independent ANOVA was performed to test the effects of cycle phase, use of hormonal contraceptives and relationship status which resulted in finding a significant main effect of 'use of hormonal contraceptives' ($F(1,60) = 4.87$, $p = .031$), a marginally significant interaction effect of 'use of hormonal contraceptives' and 'cycle phase' ($F(1,60) = 3.85$, $p = .055$) and a marginally significant interaction effect of 'cycle phase' and 'relationship status' ($F(1,60) = 3.50$, $p = .067$) on choice of ads with GGI-models. Compared to non-pill-users, pill users picked the ads with a GGI-model significantly more often. Furthermore, cycle phase affected choice for ads with GGI-models differently for the group of non-pill-users compared to pill-users. Within the pill-using group, the mean score of participants in their late-follicular phase was slightly lower than the one of participants in their luteal phase, whereas the opposite was true for the non-pill-using group. Participants having a serious relationship scored higher than single respondents if they were in their late follicular phase, but lower if they were in their luteal phase (see figure 2). The same effect was found when only pill-using respondents were taken into account ($F(1,32) = 6.67$, $p = .015$). Due to a lack of non-pill using participants who are engaged in a serious relationship, comparisons within this group of relationship status were not reliable. Since pill-users were significantly older than non-pill-users ($t(64) = 2.60$, $p = .012$), an ANCOVA was performed with the variable 'age' as covariate. The main effect of 'use of hormonal contraceptives' reported above, was no longer significant ($p > .1$) but the same marginally significant interaction effects were found ($ps < .1$). Using only those respondent who are engaged in a serious relationship did not yield any significant results (most probably due to a lack of respondents in the non-pill-using group). Not including single participants for the pill-using group yielded the predicted effect (more

choices for ads with GGI-models within the group of non-pill-users than within the group of pill-users for the late follicular phase) but the interaction effect between 'use of hormonal contraceptives' and 'cycle phase' is not significant ($F(1,38) = 2.07$, $p = .16$). It is concluded that these findings do not support hypothesis 3. Only when differences between pill-users and non-pill-users are taken into account, cycle phase marginally significantly affects choices for ads with GGI-models.



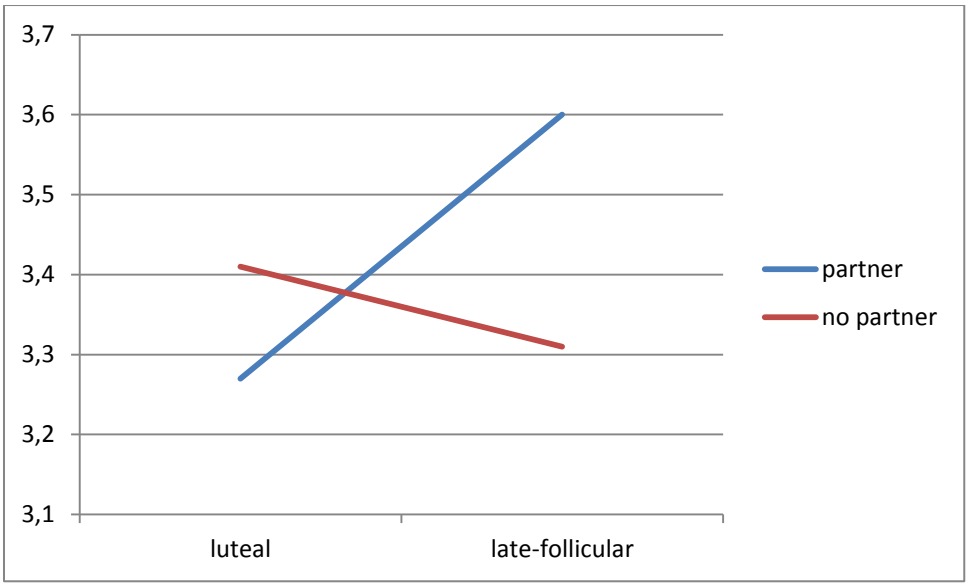




**Figure 2: result of 3-way independent ANOVA. Values on the Y-axis represent sum of choices for ads with GGI-models**

### 6.4 Hypothesis 4

Firstly, hypothesis 4 predicts that, within the group of non-pill-users, fertile women rate ads containing GGI-models higher than non-fertile women and that this effect will not arise within the group of pill-users. Three variables were created with values equal to average attitude scores, respectively, for all ads containing GGI-models, for all ads containing the alternative male models and for three of the filler ads. A three-way repeated ANCOVA was performed with variables 'age' and 'relationship status' as covariates, variables 'cycle phase' and 'use of hormonal contraceptives' as between-subjects factors and 'type of ad' as within-subjects factor. Average attitude scores for ads with GGI-models, ads with alternative models and filler ads were chosen to be the respective three levels of the within-subjects factor, thus were the dependent variables. A main effect of 'type of ad' was found on ad attitude ($F(2, 59) = 4.53$, $p = .029$), as well as a two-way interaction effect of 'cycle phase' and 'use of hormonal contraceptives' ($F(1, 60) = 4.49$, $p = .038$) and a three-way interaction effect of 'type of ad', 'cycle phase' and 'use of hormonal contraceptives' ($F(2, 59) = 4.58$, $p = .029$). Concerning the main effect of 'type of ad', significant pairwise differences were found between attitude scores for ads with GGI-models and ads with alternative models, as well as between scores for ads with alternative models and filler ads. As for the interaction effect of 'cycle phase' and 'use of hormonal contraceptives', it was found that, for the non-pill-using group, subjects in their late follicular phase ,on average, had less favorable attitudes towards the ads than subjects in their luteal phase, whereas the opposite is true for the pill-using group (figure 3). The three-way interaction effect shows that this interaction is mainly due to the ads presenting men (level 1 and 2) (figure 4). These findings indicate that cycle phase affects attitude scores for ads presenting male models differently for pill-users and non-pill-users. If in their late follicular phase, the latter group seems to be more demanding when rating (an ad with) a male model.

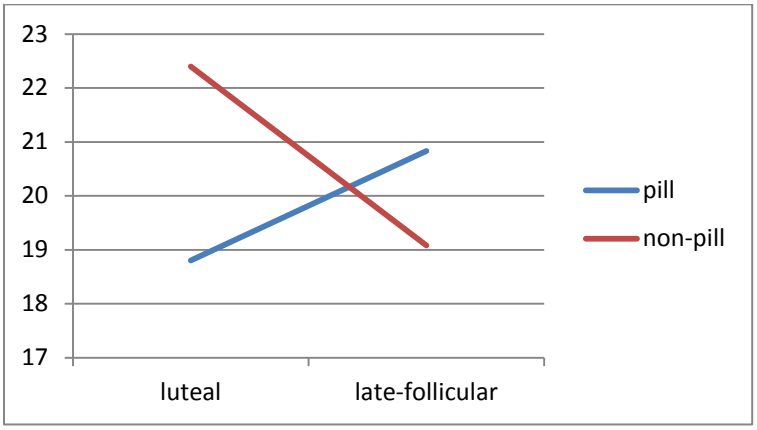
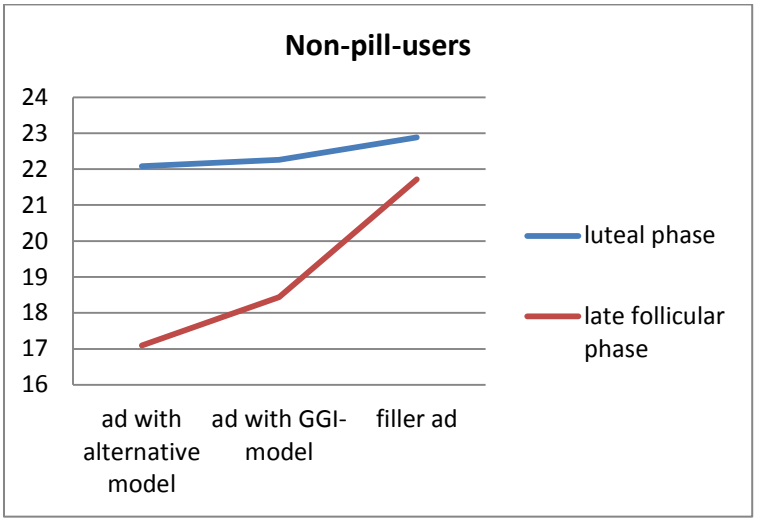



**Figure 3: two-way interaction effect of 'cycle phase' and 'use of hormonal contraceptives'**



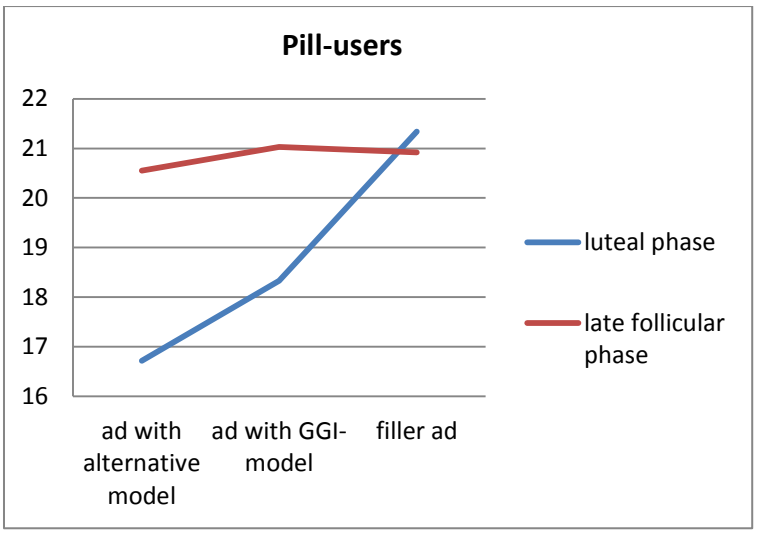




**Figure 4: three-way interaction effect of 'type of ad' (X-axis), 'cycle phase' (different lines) and 'use of hormonal contraceptives' (different figures)**

Next, a two-way repeated ANCOVA was performed only on the non-pill-using group with 'age' and 'relationship status' as covariates, 'cycle phase' as between-subjects factor and 'type of ad' as within-subjects factor (two levels are included: ads with GGI-models and ads with alternative models). Consequently, the dependent variables are attitude scores on the ads with GGI-models and the ads with alternative male models. This analysis was performed to check whether cycle phase produces a significant shift in attitudes towards ads with male models with and without GGI. A marginally significant main effect ($F$ (1, 25) = 3.00, $p$ = .96) of 'type of ad' and a marginally significant interaction effect ($F$ (1, 25) = 3.28, $p$ = .082) of 'type of ad' and 'cycle phase' was found. Attitudes for the ads with a GGI-model were higher than those presenting the alternative model (main effect) and this effect was totally accounted for by the 'late follicular' group (interaction effect, see figure 5). A similar analysis was performed for the pill-using group and no main effect of 'type of ad' was found ($F$(1,33) = .044, $p$ = .835), nor an interaction effect of 'type of ad' and 'cycle phase' ($F$(1,33) = 1.75, $p$ = .20). From these analyses it is concluded that the first part of hypothesis 4 is supported.

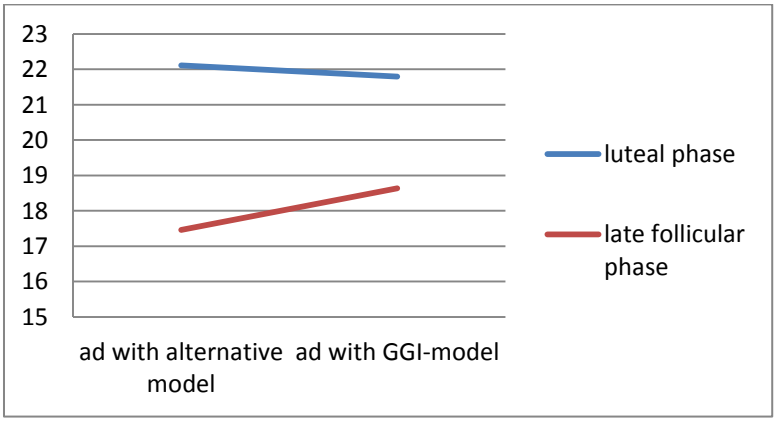



**Figure 5: interaction effect of 'type of ad' and 'cycle phase'**

Second, hypothesis 4 predicts a similar effect of cycle phase on brand attitudes. Two variables were created with values equal to the average attitude scores for the brands that accompanied sexually appealing models (both with and without GGI) throughout the survey and an average

attitude score for a brand that did not accompany any male model, only filler ads ('filler brand'). Similar analyses as for the first part of hypothesis 4 were conducted, but none of those yielded significant results. Based on this dataset, it is concluded that the second part of hypothesis 4 cannot be accepted.

## 7. Discussion

The effects of sexual appeals on communication effectiveness, especially towards women, are not totally comprehended in advertising literature yet. It is interesting to apply knowledge acquired in the field of evolutionary psychology and biology to this matter and deepen the understanding of reactions of female consumers to this particular type of advertising. This study yielded some interesting insights about the effects of different types of sexually appealing male models on ad preference and attitude and provides some support of the presence of menstrual cycle effects for non-pill-users in an advertising context. It was found, according to the predictions that women more often choose for an ad with a sexually appealing male model than men. This indicates an enlarged frequency of choice of women for these types of ads. These findings are in line with the findings of Severn et al. (1993) that sexy ads evoke more ad-execution related thoughts than unsexy ads since both studies found indications of a relation between sexual appeals in advertising and attention although in none of these studies attention was directly measured. However this study contributes to an understanding of the effects of the use of a sexually appealing male model on ad attention of men and women, a superior method to measure attention (eye-tracking) than the one used in this study (quick choice) is available. An advantage of the use of real-life advertisements is that a higher external validity is obtained since observed choices between ads approach realistic choices between ads that are successful in reality.

Opposed to the predictions, it was found that normally cycling women in their late follicular phase) did not choose ads with sexually appealing male models more often than non-fertile women. A possible explanation could be that alternative ads were chosen to be original or funny to enhance external validity (it were real, successful ads) but this implies that some disturbing factors such as originality, use of humor or emotional contents which also affect ad choice dependent on menstrual cycle phase, could have played a role.

The prediction that, within the non-pill-using group, cycle phase significantly affects choices for ads with models with good genes indicators (GGI-models) was not supported as such. However, comparing this group to the pill-using group resulted in finding that cycle phase affects choices for ads with GGI-models differently for both groups in the predicted way. For non-pill-users, being in the fertile phase affects choices for ads with GGI-models positively, whereas for pill-users a slightly negative effect was found. Moreover, relationship status was found to affect the number of choices for ads with GGI-models dependent on cycle phase when both pill-users and non-pill-users were taken into account, as well as when only non-pill-users were taken into account. Women having a serious relationship were found to choose these ads more often when being in the period of 8 days preceding ovulation. This effect could explain partly why no significant results were found for hypothesis 3. A lack of participants who were not taking hormonal contraceptives and had a serious relationship could have resulted in a weaker effect of cycle phase on choices for the non-pill-using group.

According to what was predicted, ads presenting GGI-models yielded higher attitude scores for women within the non-pill-using group compared to ads presenting alternative male models and this effect was accounted for by women in their late follicular phase. No similar results were found within the pill-using group. This study did not find any significant menstrual cycle effects on brand attitudes. The problem here was that real brands were used so, probably, attitudes towards the brand were not significantly affected by the ads presented.

Findings of this study for predictions concerning menstrual cycle effects, at the one hand, contribute to literature concerning ovulatory effects on female behavior (e.g. Gangestad et al., 2004, 2007; Haselton & Gangestad, 2006) by extending the effect to an advertising context. Interestingly, a common measure of good genes quality, namely 'fluctuating asymmetry' (for an example, see Gangestad & Thornhill, 1998), was not manipulated so the reported effects were due to other 'cues of good genes'. On the other hand, the findings contribute to consumer behavior literature by showing how hormonal influences can affect attention and attitude towards advertisements. Additionally, it is shown how a more thorough understanding of sexual appeals can be obtained by using evolutionary concepts in order to manipulate attractiveness in a more objective way. Real models for clothing brands were used and manipulated (using Photoshop CS5) yielding the advantage that for each choice, both men could realistically be modeling for a famous clothing brand and, thus, of an enhanced external validity.

### *7.1 Limitations and future research*

A first important limitation of this study is the size and the nature of the dataset. It is not easy to find a large, homogenous set of respondents who do not use hormonal contraceptives, are neither in their menstrual phase nor in between phases (on days in their cycles which are not objectively assignable to the phases of use for this study) and are willing and able to give detailed information about their current and typical menstrual cycle, without offering major incentives. It is highly likely that doubling the number of respondents would have resulted in finding support for more of the predicted effects. Furthermore, just a small range of ages was reached and there was a lack of non-pill-using respondents engaged in a serious relationship. Second, the measure of ad choice is not optimal. To measure attention, it would be better to test the ads in a natural environment of, for example, a magazine. The technique of eye-tracking could be of great value to perform such analysis. Within the scope of this study, the

assumption that a quick choice of an ad predicts ‘more attention’ to this ad is needed. However it was found that choice does not predict attitude, it cannot be ruled out that validity of this measure is low since it is still possible that some attitude-measure influences choice between ads. Related to this, a third limitation of this study is that exposure to and choice of an ad was ‘forced’. A choice for an ad does not guarantee that any attention to the ad is drawn in a real-life environment. Fourth, only ads for brands that are related to sexual appeals (clothing brands) were included so no generalizations can be made to ads for brands or products that have nothing to do with sexual appeal (e.g. screwdrivers). Finally, real brands were used so brand attitude measures did not provide insight in how sexually appealing models or cycle phase could affect brand attitudes.

It would be useful to replicate this study on a larger and more ‘diverse’ dataset to generalize the results to different age groups and to find (further) support for the predictions. Furthermore, an experimental design adapted to measuring effects of cycle phase on brand attitudes of (non-existing) brands that are accompanied by sexually appealing models (with or without GGI) could yield very interesting results. Finally, it can be stated that these results justify a replication of this kind of study with the use of a more sophisticated measure (for example, eye-tracking) of attention.

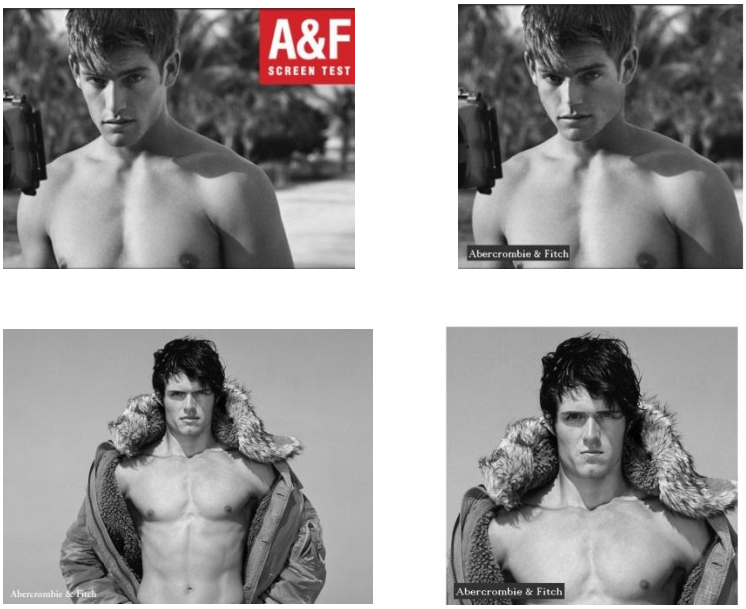
Implications of this research for marketers and managers are that, on the one hand, using sexually appealing ads displaying male models are likely to draw more attention from women than from men and that the use of them is not appropriate when a group of male consumers is targeted. It is, however, important to stress that the use of sexual appeals, humor or other means to draw attention from female consumers are not mutually exclusive. On the other hand, when implementing an advertising campaign targeting women, it could be useful to take into account whether the target group mainly uses hormonal contraceptives or is engaged in a serious relationship. Using models with good genes indicators is most effective in drawing

attention from and creating positive attitudes towards the ad when your female consumers are fertile (non-pill-using and near ovulation) and committed in a relationship.

In sum, this research established a relation between the phase in the menstrual cycle of women who are not using hormonal contraceptives, on the one hand, and attitudes towards ads with different kinds of sexually appealing models on the other hand. Moreover a contribution is made to a caveat in consumer research by finding the result that women choose an ad more often when a sexually appealing model is in it.

# 8. Appendices


**Appendix A: an example of the choice between a male model and another type of ad**




**Appendix B: transformation between the original models (left) to the models used (right): the one above is low on the manipulated GGI, the one below is high on the manipulated GGI**

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