I'm Too Sexy (Exciting, Sophisticated, and Sincere) For My Brands: Menstrual Cycle Effects on Attitudes Toward Brand Personalities

Alessandra Boezio

A Thesis

In

The John Molson School of Business

Presented in Partial Fulfillment of the Requirements

for the Degree of Master of Science (Administration) at

Concordia University

Montreal, Quebec, Canada

April 2012

CONCORDIA UNIVERSITY

School of Graduate Studies

This is to certify that the thesis prepared

By: Alessandra Boezio

Entitled: I'm Too Sexy (Exciting, Sophisticated, and Sincere) For My Brands: Menstrual Cycle Effects on Attitudes Toward Brand Personalities

and submitted in partial fulfillment of the requirements for the degree of

Master of Science (Administration)

complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Signed by the final examining committee:

_____
Dr. Linda Dyer

_____
Dr. Darlene Walsh

_____
Dr. Bianca Grohmann

_____
Dr. Gad Saad

Approved by _____
Chair of Department or Graduate Program Director

April 14, 2012 _____
Dean of Faculty

Abstract

I'm Too Sexy (Exciting, Sophisticated, and Sincere) For My Brands: Menstrual Cycle Effects on Attitudes Toward Brand Personalities

Alessandra Boezio

Hormonal changes across women's menstrual cycles are a determinant factor in the types of goods women will consume. During the fertile phase of the menstrual cycle women are more likely to spend money on clothing and beautification products. Conversely, in the luteal (non fertile) phase, women will consume more food and home related products (Durante et al., 2011; Saad and Stenstrom, 2012). The objective of this thesis is to extend past the research on menstrual cycle effects in a consumer setting and explore the relationship between menstrual cycle and brand personalities. It is posited that women will exhibit greater (lower) preferences for brands signalling 'sexy', 'exciting' and 'sophisticated' traits on fertile (luteal) days with a greater (lower) preference for 'sincere' brands on luteal (fertile) days. This relationship between menstrual cycle phase (fertile or luteal) and brand personalities is expected to be moderated by the specific individual differences of the participants, namely, with regards to relationship status, brand loyalty, and the participants' propensity to engage in brand signalling. Although no main effects of menstrual cycle on brand preferences were found, the current research found a link between menstrual cycle phase, trait brand signalling, and preferences for certain brand traits ('sophisticated' and 'exciting'). Also, an association between menstrual cycle phase, relationship status, and preferences for 'sexy' brands was discovered. This paper is the first of its kind to explore how hormonal changes across the menstrual cycle influence brand preferences within a given product

category. The findings from this paper contribute to both the evolutionary consumption and brand personality research streams.

Acknowledgements

I'd like to begin by thanking my supervisor Dr. Gad Saad, for all his help and direction. Throughout this process, he was been a wonderful teacher and I particularly appreciate his commitment to making this manuscript the best it could be. Dr. Saad's editing skills and vast knowledge is something to be admired and I am proud to say it has helped me grow as researcher and writer. A special thanks to Eric Stenstrom, who was a great research partner. I will always be grateful for our weekly meetings and the guidance he provided me throughout this process. I would also like to thank Drs. Bianca Grohmann and Darlene Walsh for taking the time to serve as my committee members.

On a personal note, I owe my family, Marisa Pedi-Boezio, Pierluigi Boezio, and Andrew Boezio a huge thank you. They have been nothing but supportive and helpful through my entire education. I appreciate their endless love and patience more than they'll ever know. Finally, to Gabriele Colasurdo, who was there to help me when I needed it, I will forever be in awe of his work ethic and unwavering support.

Table of Contents

List of Figures

List of Tables

List of Exhibits

Introduction

"Diamonds are a girl's best friend," the famous line, uttered in 1953 by Marilyn Monroe, Hollywood's ultimate glamour girl, provides some insight into how women feel about expensive and luxurious goods. In 1961, the movie "Breakfast at Tiffany's" was released about a beautiful, but poor woman, Audrey Hepburn, spending her mornings eating breakfast in front of the high end jewellery store, Tiffany's. Today's modern women may not be that different from those characters portrayed by Marilyn Monroe and Audrey Hepburn. A telling statistic for the year 2008 is that women were responsible for 72.9% of consumer spending in the United States alone (Silverstein and Sayre, 2009). Furthermore, global expenditures on woman's luxury products and brand names are estimated to be worth US$ 450 billion by 2012 (Tungate, 2008). Fashion and leather goods account for the largest proportion of this estimated amount, followed by perfumes and cosmetics and the remaining portion by watches and jewellery (Tungate, 2008). From a psychological perspective, women place greater importance on the shopping experience than men and studies show that their sense of self is more tied to this experience (Dittmar and Druty, 2000). Moreover, women are more likely to engage in compulsive buying (Dittmar, 2005) and overall hold more credit card debt than men (Coleman, 2002).

A question of interest to marketers, is why women gravitate toward certain brand names and luxury goods over others? A variety of research has been done in this field to explain why people are likely to invest a substantial amount of money (sometimes beyond their means) for certain brand name products. Examples include social expectations (Mandel et al., 2006), self esteem (Belk, 1988), power (Rucker and Galinsky, 2008), and the status of rarity (status of possessing rare products) (Phau and

Prendergast, 2000). Although these may be valid explanations, the objective of this thesis is to explore women's interest in brands from a different perspective; that of evolutionary psychology.

An emerging field of study, evolutionary consumption, explores the way modern day humans consume based on Darwinian modules (Saad, 2007). Previous research in this field with regards to brand names and luxury goods has found that men engage in conspicuous consumption (buying expensive publicly consumed goods/services) in order to attract suitable mates (Griskevicius et al., 2007; Saad, 2007; Saad and Vongas, 2009). While there is little research to determine if this is true for women, studies have shown that women are more likely to buy clothing and beautification products during the fertile phase of their menstrual cycle, as opposed to the luteal (non-fertile) phase of their menstrual cycle (Durante et al., 2011; Saad and Stenstrom, 2012). Evolutionary theory posits that women are more likely to invest in their physical appearance when fertile in order to increase their chances of finding the best mate when conception is possible (Gangestad et al., 2005).

The main purpose of this study is to examine if women who are in the fertile phase of their menstrual cycle also more likely to prefer brands that project certain personality traits. More specifically, this thesis posits that in order to attract the best possible mate, women will prefer brands that signal sexiness, femininity, excitement, sophistication and sincerity to a greater extent during the fertile phase of their menstrual cycle. This proposed relationship between menstrual cycle phase (fertile or luteal) and brand personalities is expected to be moderated by specific individual differences of the

participants, namely with regards to brand loyalty, relationship status, and the participants propensity to engage in brand signalling.

This manuscript begins with a review of the literature on the menstrual cycle and its effects on women's behaviours with regards to mating and their associated product choices. A detailed overview of the brand personality literature, including brand gender, brand loyalty, and brand signalling, will follow. This theoretical foundation provides a basis for the subsequent hypothesis and methodology sections, which will then lead to the results and analysis of the data collected. To conclude, a discussion of the limitations, managerial and societal implications of this study are presented.

Theoretical Foundation

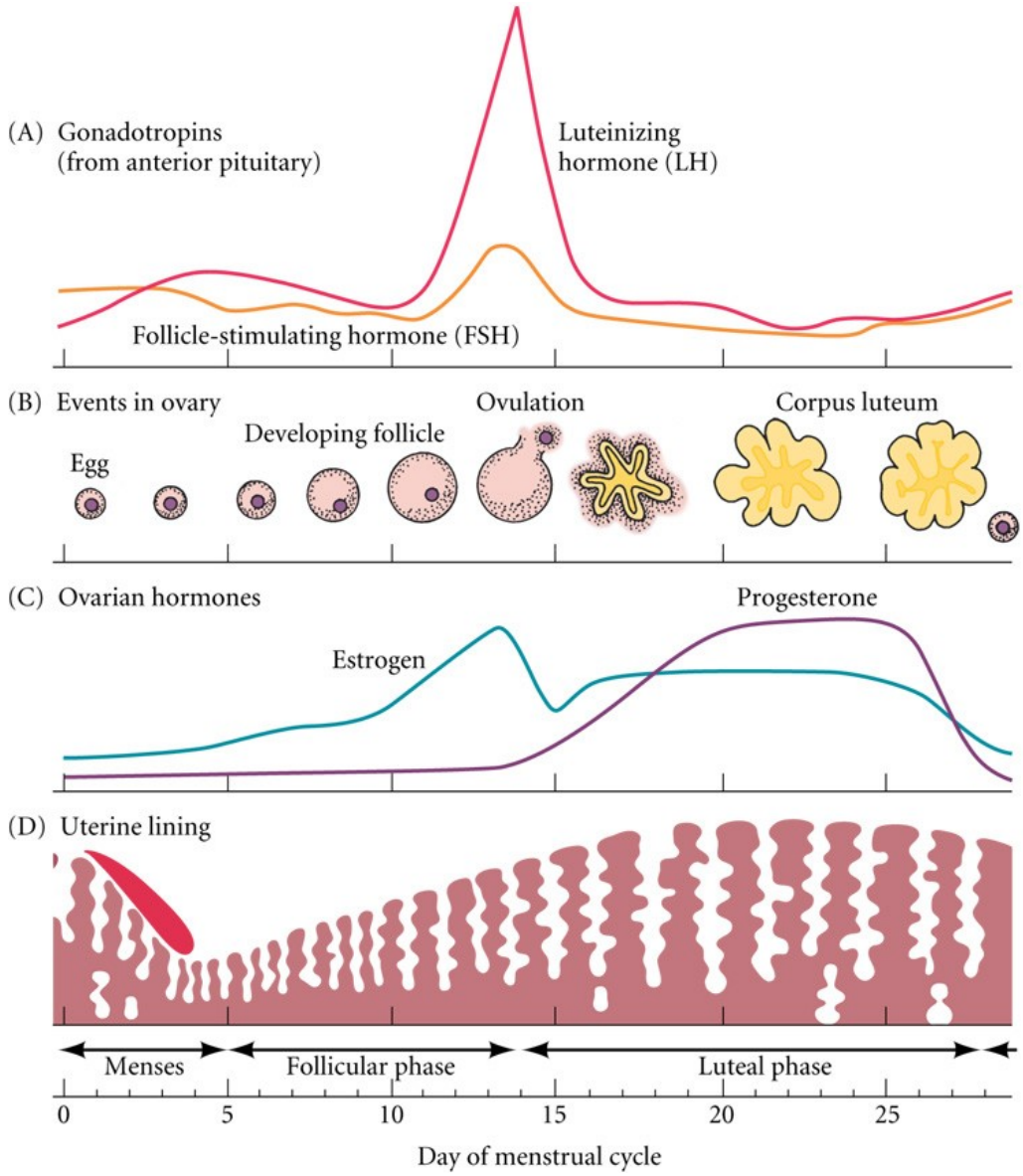
Overview

The hypotheses in this thesis are based on two diverse research streams, menstrual cycle studies within evolutionary psychology and branding. There has been an enormous amount of research done on the female menstrual cycle and its impact on women's behaviors. Evolutionary psychologists posit that shifts in a woman's behavior according to her menstrual cycle are shaped by natural selection (Gangestad and Thornhill, 1998; 2008). These changes in behavior are numerous and are adaptive mechanisms for a variety of problems of evolutionary import. According to Saad (2007) humans engage in a multitude of behaviors that can be categorized as a function of four Darwinian modules: reproductive (e.g., finding mate), survival (e.g., finding food and avoiding predators), kin selection (investing in offspring and closely related family members) and reciprocity (as occurs when building friendships and coalitions). The menstrual cycle literature review presented in this thesis focuses on the menstrual cycle effects that have evolved because of the reproductive module. The theoretical foundations of this thesis are separated in two main parts. The first part begins with an overview of menstrual cycle physiology; this is then followed by a discussion of hormonal changes in the menstrual cycle and the effects the menstrual cycle has on mate selection, relationships, self esteem, clothing choice, and decisions in a consumer setting. The second part of the foundation discusses a subset of consumer behavior, branding, more specifically research related to brand personalities, brand gender, brand loyalty, and brand signalling.

Human Menstrual Cycle

The female menstrual cycle lasts an average of 28 days, however, it is not unusual for cycles to last between 25 and 36 days. Over these 28 days, the menstrual cycle can be divided into three phases: the menstrual, follicular, and luteal phase. The menstrual phase occurs days 1 to 4 of a 28-day cycle. On days 1 to 4, the uterine walls shed their lining causing a woman to bleed and experience a cramping sensation. During this phase the woman's estrogen and progesterone levels are at their lowest. Estrogen and progesterone are hormones produced by the ovaries that regulate the menstrual cycle. Estrogen prepares the uterus for pregnancy by thickening the endometrium (the lining of the uterine wall) and progesterone works to sustain the lining. The end of the menstrual phase marks the beginning of the follicular phase, which spans days 5 to 14. In the beginning of the follicular phase estrogen levels begin to rise and peak at ovulation. It is difficult to correctly predict the most fertile days of a woman's cycle, however, the most accurately estimated window has been reported to occur between days 9 and 15. The luteal phase, days 16 to 28, begins after ovulation, when estrogen levels begin to decrease and progestrone levels begin to rise. In this phase the body prepares itself for a possible conception. If the egg is not fertilized, it will dissolve, and a drop in progesterone will occur triggering the uterine lining to shed and the cycle to restart (Gilbert, 2010).

Figure 1: Human Menstrual Cycle



Source: S.F. Gilbert (2010) Developmental Biology (9th ed.). Sunderland, MA: Sinauer Associates (Online Edition). *Note*: Permission was obtained from Sinauer Associates for use of this figure.

Hormonal Changes

The fluctuation of ovulatory hormones (estrogen and progestrone), during a woman's cycle, does much more than just prepare a woman's body for pregnancy. These

fluctuating hormones have been found to have a significant impact on behaviour and preferences as well. Gangestad and Thornhill (1998; 2008) proposed, through their Ovulatory Shift Hypothesis, that natural selection has caused certain aspects of women's behaviour to change throughout their menstrual cycle especially during their most fertile period, the follicular phase (days 9-15). During this phase a woman's interest in men possessing certain characteristics, such as facial symmetry, athleticism and creative abilities will intensify and her behaviour will change accordingly. This change in mate driven behaviour can manifest itself in a variety of ways. Women in the fertile window of their menstrual cycle tend to prefer specific types of males, clothing, consumer products and perhaps, as proposed by this thesis, brands.

Mates

Humans are one of the relatively few species where both genders will nurture (co-parent) their offspring. However, of the two genders, females provide a greater parental investment in their offspring; as a result, this led ancestral females to look for specific qualities when searching for a mate (Saad, 2007). Two aspects were important for the ancestral female to consider: (1) that she find a mate that would be a good provider, who would help ensure survival for herself and her offspring. (2) She find a male with 'good genes' that her offspring would inherit. Good genes manifest themselves via facial symmetry (good looks), athleticism (muscular, tall physique), and creative abilities. Facial symmetry and athleticism are also descriptors of a genetically fit individual (free from disease and disability) (Gangestad et al., 2005; Little et al., 2007; Pawlowski and Jasienska 2005).

Studies performed by researchers in the field of evolutionary psychology have found that when fertile, women will prefer males with physical symmetry, certain types of talents (e.g. social skills, artistic abilities, creative thinking), and masculine faces and voices (Gangestad et al., 2004; Gangestad et al., 2005; Haselton and Miller, 2006; Perrett et al., 1999; Penton-Voak and Perret 1999; Putts, 2005). Gangestad and Thornhill (1998; 1999) discovered that in their fertile period women will prefer the scent of a t-shirt worn by a symmetrical (face and body) male over one worn by a non symmetrical male while women in their luteal phase were found to have no scent preference. A possible explanation for this preference may have been that the genes of ancestral women who had preferred asymmetrical males did not survive due to the various genetic health problems associated with asymmetrical males (pathogens, toxins, developmental difficulties, mutations, disease) (Gangestad et al., 2005; Perrett et al., 1999). In addition, to a preference for symmetrical faces, women on fertile days also have a preference for testosterone dependent traits (exaggerated masculine features) such as large jaws, prominent brow ridges and low, deep voices (Gangestad et al., 2004; Putts, 2005). These features are believed to be attractive because they are indicators of immunocompetence (body's ability to produce a normal immune response), and only males in good physical condition would be able to sustain the cost of such exaggerated features (Penton-Voak and Perret, 1999).

Aside from preferring physical indicators of fitness, women have also been found to prefer mental indicators of fitness, such as creativity and resourcefulness. In fact, women will rather mate with a talented (creative) male over a wealthy male more often when in the fertile phase of their cycle than when non fertile phase. Haselton and Miller

(2006) designed a study whereby 41 females were asked if they would prefer a mate who had either "(1) a lot of creative intelligence and a little money", or (2) "a little creative intelligence and a lot of money". Results show a correlation between a preference for creative, poor males and fertility, indicating that for short term mating the genes of the prospective male suitor are far more important than his current financial resources. These mating drives are what will motivate women to choose brand personalities that will signal their viability as a mate.

Relationship Status

Researchers have proposed that women engage in two different mating strategies: long term and short term. Relationship status is an important consideration for this study as it will be expected to moderate the relationship between menstrual cycle effects and preference for brand traits. Women are more likely to engage in short term mating with those males that exhibit 'good genes' and engage in long term mating with those males who fall into the 'good provider' category (Buss and Schmitt, 1993; Gangestad et al., 2005). The underlying premise behind this behaviour is that it only takes a short term encounter to conceive a child (gain the genetic fitness), but it takes years to rear one. Some women with very high mate value may be able to find men who satisfy both the "good provider" and "good genes" role. However, for most women it may be difficult finding these two sets of traits in the same male, as a result, ancestral females took on a dual mating strategy, short term and long term (Haselton and Miller, 2006; Pillsworth and Haselton, 2006). For short term mating, women search out and mate with men possessing these "good genes" more so in their fertile phase than in their non-fertile luteal phase.

In addition, to having a preference for certain types of males, women in their fertile phase are also more likely to cheat on their current romantic partners if they believe their current partners are lacking in "good genes" (Gangestad et al., 2002; Garver-Apgar et al., 2006). The reason for this is because the cost of extra pair mating (cheating on a current partner) is ever present throughout the menstrual cycle, however, the benefit of cheating on a current partner with a "good genes" partner is only worth the risk if conception is possible (Gangestad et al., 2004). In the luteal phase, when the body prepares itself for a possible pregnancy, women are more likely to be attracted to men who fit the 'good provider' role. Furthermore, a women's general interest in mating increases the closer she is to ovulation (Gangestad and Thornhill 1998; 2008). In this period (fertile phase) women seem to more attentive to stimuli of a sexual nature (Krug et al., 2000) and researchers have reported an increased desire (Dennerstein et al., 1994; Silber, 1994) and interest for sex (Stanislaw and Rice, 1988). Aside from mating and partner choice, the menstrual cycle can also influence women's perceptions including one's self esteem.

Self Esteem

Women's self esteem and the way they feel about their looks has a significant impact on their behaviours. From a biological perspective, women at peak fertility have reported feeling sexier and more attractive (Haselton and Gangestad, 2006), while during ovulation, a variety of studies have found that women were rated as being more attractive by others (Havlicek et al., 2005; Miller et al., 2007; Thornhill et al., 2003). According to Hill and Durante (2009), for some people, self esteem is positively influenced by self perceived mate value, and low self esteem can drive "mate-value enhancement efforts"

(p. 1593). Relationship status, relationship satisfaction (Bui et al., 1996), and the mate value of other women seen as romantic rivals (intrasexual competition) will all affect a woman's self perceived mate value (Kendrick et al., 1999). Hill and Durante (2009) discovered that across the menstrual cycle self-esteem is negatively related to fertility, whereby leading up to peak fertility women will have a lower self esteem. The authors suggest that the decrease in self esteem during this period motivates women to invest more effort in mate-value enhancements. Their reasoning is based on the fact that self esteem is negatively correlated with the amount of effort spent on mate-value enhancement activities (Brase and Guy, 2004). It is proposed that this behaviour was an adaptive mechanism whereby those ancestral women who invested in mate-value enhancement efforts while ovulating were more likely to attract a desirable mate and reproduce (Hill and Durante, 2009). The mate-value enhancement activities being discussed can be implemented in a variety of ways, especially through a women's choice of clothing and consumer products, and perhaps brands.

Clothing Choice

Clothing choice exemplifies a mate-value enhancement activity, as a result, several studies have tested the relationship between clothing choice and menstrual cycle. These studies found that on fertile days, women do in fact dress in a more attractive and sexy manner (Grammer et al., 2006; Haselton et al., 2006; Durante et al., 2008; Saad and Strenstrom, 2012). The first researchers to explore this relationship, Grammer et al. (2006), measured estrogen levels through salivary tests and took photographs of women in an Austrian night club. They discovered a correlation between women who wore tighter more revealing clothing and estrogen levels. Though estrogen levels and ovulation

are not the same thing, other studies went on to examine this occurrence with ovulation being the independent variable. Grammer et al.'s (2006) work was followed up by Haselton et al. (2006) who photographed partnered women during ovulation and asked judges to evaluate the photographs. It was discovered that behaviours like self grooming (hair styles) and attractive clothing choices (head to toe clothing, and jewelry) were influenced by how far along women were in their menstrual cycle. Those women in the fertile period were rated by the judges as "trying to be more attractive" than those in their luteal phase.

Durante et al. (2008) continued Haselton et al.'s (2006) work by not only photographing the same participants during their fertile and luteal phases, but also asking them to sketch on an outline of a model figure what they would wear on a night out. The authors found that women drew more revealing and sexy clothing on the model when they were in their fertile phase. Women in their luteal phase were more likely to draw looser, less sexy clothing options. There was a discrepancy, however, between the photographs (actual attire worn to the laboratory) and the illustrations sketched by the participants. The authors believe this difference is due to a combination of factors, including relationship status and satisfaction, perceived attractiveness and SOI score (the extent to which women will engage in sexual intercourse without a commitment). These factors seemed to deter the participating women from actually wearing what they would ideally like to have worn, when fertile. Conversely, women are more likely to buy these "ideal" outfits during high fertility than low fertility (Durante et al. 2011; Saad and Stenstrom, 2012). This occurrence is addressed in greater detail in the next section.

Menstrual Cycle Effects in the Consumer Setting

As was mentioned in the introduction, an emerging field of research, evolutionary consumption, has discovered that humans' consumer choices are linked to four overriding Darwinian modules. Saad and Gill (2000) were the first to propose that the menstrual cycle and consumer behaviour may be related. Later, Saad (2006, 2007) elaborated on this theory by suggesting that the consumption of beautification products (make-up, high heels, haircuts) might be influenced by the menstrual cycle as well. The two studies discussed below looked at different facets of consumer behaviour across the menstrual cycle, and empirically tested Saad and Gill's (2000) theory.

Durante et al. (2011) measured women's preferences for certain types of clothes across their menstrual cycle. Using an over-the-counter urine test, participants were either placed in a high fertility or low fertility group. Each group was asked to complete a shopping task on a mock retail website and select ten clothing and/or accessory items that they would buy for themselves. Women in the high fertility group selected a greater percentage of sexy clothing and accessory items, than those in the low fertility group. Durante et al. (2011) believed that this "ovulation product-choice effect" was based on intra-sexual competition. In study two, women were asked to complete the shopping task again, but this time the women were primed to think of either (1) attractive local women, (2) unattractive local women, (3) attractive local men, or (4) unattractive local men. When primed with local attractive women (potential rivals), participants in the high fertility group chose significantly more sexy items than those in the low fertility group. Priming women with attractive local men, also led to the selection of the sexy items, however, this was true regardless of the fertility group (high or low).

Saad and Stenstrom (2012) tracked women's food and appearance related consumption for 35 consecutive days. Women's menstrual cycle was estimated using a counting method. Appearance related expenditures increased during the fertile phase of the participants' cycle, while their food related expenditures increased while participants were in the luteal phase of their cycle. The authors point out that over the course of the 35-day period, the appearance-related and food expenditures seem to have mirrored the fluctuating estrogen and progesterone levels across the cycle. This work differs from that of Durante et al. (2011) because it takes into account real life purchases and decision making, rather than measuring the purchase likelihood of hypothetical scenarios.

While Saad and Stenstrom (2012) and Durante et al. (2011) looked at the relationship of menstrual cycle on various consumer-related phenomena, the present thesis extends their work by exploring the link between menstrual cycle and branding. The ensuing section offers an overview of branding (a subgroup of consumer behaviour) and brand personality.

Branding

Branding is a vast topic encompassing many research streams, ranging from brand communities (e.g., Muniz Jr. and O'Guinn, 2001) to brand experience (e.g., Brakus et al. 2009) and brand equity (Ha, 2010). Brand equity can be defined as the "incremental utility gained by a product or service by virtue of its brand name" (Ha, 2010, p. 911). Brand Equity encompasses four broad research streams: (1) brand awareness; (2) brand association (brand personality); (3) perceived quality; and (4) brand loyalty (Aaker, 1996). Of these research streams, the focus in this thesis will be mainly on brand association (brand personality) and broadly on brand loyalty.

Brand Personality

Brand personality refers to the premise that consumers attribute human personality traits to their brands. Aaker (1997)'s seminal paper mapped brand traits onto five personality dimensions: *sincerity, excitement, competence, sophistication,* and *ruggedness*. Previous research shows that a preference for particular brands reflects those personality traits that are similar to consumers' ideal or actual personalities; as such, brand personality is an important aspect of branding research (Aaker, 1997; Belk, 1988). People will tend to choose and use brands with certain personality dimensions that reflect aspects of their own personality depending on the situational contexts (Aaker, 1999). The hypotheses in this thesis explore if this holds true not for a situational context but rather physiological context (menstrual cycle).

Some of the most recent literature (Grohmann 2009; Park and Roedder-John 2010; Swaminathan et al., 2009) have improved, refined, and/or extended Aaker's work through the additions of dependent/independent variables, mediators, and moderators. This thesis also aims to build on Aaker's research by adding an independent variable (menstrual cycle) to the brand personality research stream, and includes three of Aaker's brand personality dimensions (sincerity, sophistication and excitement), along with two other dimensions (sexiness and femininity). The goal of this study is to measure which brand personalities women will prefer when in the fertile or luteal phase of their menstrual cycle. The next section provides an overview of some of the most prominent brand personality studies and methodologies. In order to formulate a rigorous and appropriate methodology for testing the relationship between menstrual cycle and brand

personalities, it is useful to discuss the strengths, weaknesses, and results of various related brand personality studies.

Given that Aaker's work is foundational for the posited hypotheses in this thesis, it is important to understand some of the shortcomings of her scale (Azoulay and Kapferer 2003; Geuens et al., 2009). Her dimensions have come under fire for lacking construct validity, because they include demographic variables, such as gender (feminine), age (young), and social standing (high class). This can be problematic because demographic variables are not considered to be actual human personality traits (Azoulay and Kapferer 2003; Geuens et al., 2009). Another criticism is that Aaker's brand personality dimensions cannot be generalized to other cultures. Geuens et al. (2009) point out that a subsequent study by Aaker et al. (2001) on cross cultural brand personalities, found that only three of Aaker's five personality dimensions were present when tested in Spain, and only four of the five brand personalities were present when the study was conducted in Japan. Based on these criticisms, Geuens et al. (2009) designed a new measure of brand personality that aimed to resolve the inconsistencies mentioned above, and Grohmann (2009) designed a scale to solve the issue of gender (this scale is used in the current research). Since, the five dimensions do not adequately measure brand gender, and given that femininity has a clear link to ovulation effects, the feminine brand personality will be measured as its own separate dimension.

This thesis' aim is to measure if preferences towards brand personalities will vary according to where a woman falls in her cycle. In order to test these hypotheses, these brand personalities will have to be effectively and accurately communicated to the participants. This was done by adopting the approach of Swaminathan et al. (2009) who

manipulated brand personalities by using the same advertising primes with different tag lines. The different tag lines were designed to elicit either 'sincere' or 'exciting' personality traits. The study not only assessed the relationship between brand personalities and attitudes towards those brands, but also examined the effect that brand personalities have on brand attachment, purchase likelihood, and brand choice. This extends the scope of Aaker's (1997) work by establishing more actionable results within the marketing field by measuring how brand attitudes affect purchase intention. Similarly, the present research also went beyond the study of people's attitude towards a brand, and measured actual purchase intention.

Since the effect of brand personalities on people's behaviours and/or opinions is tackled in this thesis as well, the topic of consumer impression formation should be addressed. This can be defined as the extent to which consumers use brand personality traits to infer the corresponding human personality traits of the brand's owner (e.g., all people who wear Victoria Secret products are sophisticated because the Victoria Secret brand personality is 'sophisticated'). Fennis and Pruyn (2007) conducted an experiment to study consumer impression formation, in which participants were asked to picture a scenario where they were lost and had to ask directions from a stranger who wore a neutral sweater with either the logo *Boss* or *Australian*. Photos of the male wearing the more competent logo (*Boss)* were rated to be more competent in his ability to offer directions than the photos in which he wore the less competent logo (*Australian*). This is of note, because if women feel that certain brands signal their viability as a mate, women in their fertile phase may be more likely to purchase said brands. In addition to studying brand competence, the Fennis and Pruyn study also measured situational context and time

constraint. The more congruent the situational context with the brand and the more time the participants had to complete their impression formation task, the stronger the relationship between competence and brand logo. This finding is of relevance to the present methodological design because it indicates that to maximize the study's effectiveness, participants should have a sufficient amount of time to form their impression about the fictional *Solita* brand.

Park and Roedder-John (2010) discovered that using brands with appealing brand personalities influence how consumers view themselves, even if experiences with these brands are short-lived and limited in nature. This is similar to the research conducted by Fennis and Pruyn (2007), except that rather than using brands to make inferences about other people, the participants are making inferences about themselves based on the brand they are using. As a result, if women believe that certain brands infer mate viability, by projecting a desirable brand personality, the research on menstrual cycle effects in a consumer setting suggests that women will be more likely to buy those brands on fertile days. In addition to uncovering that brands high in personality affect self perception, Park and Roedder-John found that self implicit theory (the extent to which a person believes his/her personality is malleable) will mediate the effect of brands on self perception. This is of note for this present research, as women's behaviors/opinions have been found to fluctuate across the menstrual cycle. Malleability of a woman's personality could potentially lead the hypothesized menstrual cycle effects to be stronger or weaker. Where, women who have a highly malleable personality could be more susceptible to menstrual cycle effects. Park and Roedder-John tested their hypotheses using two brands, *Victoria's Secret* and MIT (Massachusetts Institute of Technology). In their first study,

they asked female participants to carry a *Victoria's Secret* (pretested to exhibit a 'sophisticated' brand personality) shopping bag around a shopping mall for approximately one hour. Results from this study showed that carrying the *Victoria's Secret* bag increased women's self-perception along the three sophistication traits (good looking, feminine, glamorous). Their second study replicated the first, but was designed to test a different brand (MIT), possessing another personality trait (competence), and brand experience (participants' pen use). Participants (MBA students) were placed in one of two pen conditions (MIT logo or no logo). Those who used the MIT pen had an increase in self-perception along Aaker's (1997) intelligent, leader, and hardworking traits. Park and Roedder-John's (2010) two studies demonstrate that the influence of brand personality on a person's self-perceptions occurs regardless of the item choice (i.e., shopping bag and pen) and brand personality (sophisticated, competence). This finding is of significance because this thesis aims to measures attitude towards the five brand personalities (feminine, sexy, exciting, sophisticated, and sincere) using a different item (sunglasses) from those used by Park and Roedder-John.

Where participants in the Park-Roedder-John study were aware of their self-perception change when primed with either the 'sophisticated' or 'competent' item, Fitzsimons et al. (2008) found that brand priming can also unknowingly affect a person's behaviour. These authors found that participants behaved, "in line with the brand's characteristics and [did] so with no conscious awareness of the influence" (Fitzsimons et al. 2008, p. 32). Although, previous literature finds that products/brands are an extension of one's self, Fitzsimons et al. (2008) and Park and Roedder-John (2010) explore the idea that a brand, through self perception, can also shape the person's personality. Given that

ovulation is an inconspicuous mechanism that also affects a woman's behaviour and her self-perception, these two concepts (brand impression and ovulation) share commonalities. In other words, both brand impression and ovulation can affect a woman's sense of self. Park and Roedder-John (2010) found that this unconscious change in self perception was differentially operative across people. This unconscious change in self perception is mediated by the extent to which people believe their personalities are malleable (implicit self-theory). Those people who believed their personality is fixed (entity self-theorists) have been found to be more susceptible to an unconscious change in self perception than those who believe their personality is malleable (incremental self-theorists).

As it is difficult to separate consumers with an entity self-theory from those with an incremental self-theory, it would be relevant (for this present study) to determine whether implicit self-theory can be primed. The issue of separating incremental self-theorists from entity self-theorists can possibly be addressed by the findings of Gao et al. (2009). Theses authors discuss the concept of the "shaken self" and find that consumers are likely to gravitate toward certain types of products when a confidently held self-view is temporarily cast in doubt (through subtle manipulations). Similarly, Hill and Durante (2009) measured the relationship between ovulation and self-esteem, and discovered that women had a decreased self-esteem when they were close to ovulation (high fertility). This type of mindset may be a form of the "shaken self" that Goa et al. referred to. Furthermore, the type of products that individuals with a temporarily "shaken self" will be attracted to, are precisely those that will aid in regaining their former confident self-view. Gao et al. (2009)'s third experiment found that "self-view bolstering" products

were more likely to be chosen by participants who were exposed to a doubt prime rather than a confidence prime. Based on this finding, if ovulation casts doubt on women's self-esteem, they may be more likely, when in the fertile phase, to select brands that reflect personality traits that aid in re-elevating their self-esteem.

Overall, the methodologies associated with research on brand personalities are fairly diverse. From the brand personality studies presented here, it can be seen that there are two main methodologies a researcher can undertake to measure the saliency of a brand personality: (1) the measurement of an already existing stimulus (i.e., an already existing brand) or (2) the manipulation of an original novel stimulus (i.e., a fictitious brand). Subject priming can occur through an existing brand that has been pretested or independently rated as having the desired brand personality (Fennis and Pruyn 2007; Park and Roedder-John, 2010). Or, subjects can be primed through advertising and imagined scenarios, where the endorser, tagline, or product category is manipulated (Goa et al. 2009; Swaminathan et al. 2009). The research design in this thesis employs the latter methodology, where the endorser, tagline and product category are manipulated. From the brand personality literature, one can safely conclude that brand personality scales, may not be a perfect measurement tool. Nevertheless, this is often the case for many measurement tools; as a result, a scale should be tailored to the type of data being collected. In the current thesis, aside from the published scales used, two tailored scales are also used, one for brand gender and the other for brand loyalty. The following two sections explain these scales in further detail.

Brand Gender

Since this thesis explores the relationship between branding and menstrual cycle (a physiological process unique to women), it is of upmost importance that the gender of the brand be taken into consideration as well. This is a necessary consideration because during their fertile period, women aim to accentuate their femininity and cues of reproductive fitness (Haselton et al., 2007). Brand gender refers to how feminine or masculine a brand is perceived to be. Similar to brand personality, consumers can express their femininity or masculinity through brand choices (Grohmann, 2009). One of the previously mentioned criticisms of Aaker (1997) was that her dimensions included demographic variables, such as gender, to describe brand personalities. Traits like feminine and masculine mapped onto the sophistication and ruggedness dimensions respectively. Grohmann (2009), using Aaker (1997) as a reference, constructed the MBP/FBP scale specifically for brand gender. Grohmann states that this scale is more appropriate for measuring the gender dimensions of brand personality than human personality scales. This two-dimensional 12-item adjective scale can be used with either utilitarian or symbolic brands. Brand gender (femininity and masculinity) is often used as a positioning tool for advertising and product/brand endorsers. However, prior to the development of the latter scale, researchers and marketers had relied largely on human and brand personality scales for measurement. This could have led to possible inaccurate data/results because femininity confounds with sincerity and sophistication and masculinity confounds with ruggedness. In an effort to avoid these erroneous results, as was previously mentioned, femininity as a brand trait will be included in this thesis. The

next section discusses the concept of brand signalling, one of the moderators in Park and Roeder-John (2010)'s research.

Brand Signalling

The extent to which people associate personality traits to brands and choose brands based on specific personality traits is unique to each individual. Consequently, in addition, to exploring the relationship between menstrual cycle and brand personalities, this study is interested in the individual differences of the participants that could potentially affect this posited relationship

There are three items that have been considered as moderators by brand personality researchers to explain why individuals might be more responsive to some brand personality stimuli than others: (1) self-concept connection, (2) self-monitoring, and (3) brand. The first, self-concept connection can be defined as "the degree to which [a] brand is used to express a significant aspect of the individual self" (Swaminathan et al. 2007, p. 248). In their research Swaminathan et al. (2007) studied the impact that a person's self-concept connection has on brand perception. A strong self concept connection is believed to encourage relationship strength to the brand and greater loyalty with a brand, when that brand is cast in a negative light (Fournier 1998; Swaminathan, 2007). The second, self-monitoring is the extent to which a person adapts his/her behaviour to situational cues or social protocols (Aaker, 1999). Aaker (1999) used high and low self-monitors as a moderator for her research on self schemas (people who feel they have a strong set of personality traits, as opposed to malleable personality traits) and brand choice. Aaker reported that subjects had a preference (aversion) for brands whose personality were congruent (incongruent) with their own self-schema, and found this

relationship to be enhanced for low (high) self-monitors. Lastly, brand signalling varies in the extent to which people use brands to signal a certain image or personality trait to others. This variation can be captured by a brand signalling scale. This metric, like self monitoring and self-concept connection, varies across individuals, such that those who score high on brand signalling will be more likely to use brands as a means of self-expression than those who score low on it (Park and Roedder-John, 2010). These three related albeit distinct moderators of individual differences can have a significant impact on results obtained when studying brand personalities. For the purpose of this study, brand signalling was selected because it was the most appropriate given that, according to the menstrual cycle literature, women's self expression may vary depending on where they fall in their menstrual cycle.

Brand Loyalty

Anthropomorphizing, the assigning of human characteristics to inanimate objects, is a human universal (Brown, 1991). It is clear, as shown by Aaker (1997), and many other subsequent researchers in the brand personality research stream that consumers have no trouble assigning human personality traits to brands (Aggarwal and McGill, 2007). People have human-like relationships with their products and more specifically, consumers can form close relationships with their brands (Fournier, 1998). A type of human relationship that consumers engage in with their brands is loyalty to a brand. Brand loyalty can be defined as a commitment by a consumer to repurchase or patronize a specific brand despite marketing efforts that would encourage switching behaviour (Oliver, 1999). There are two main aspects of brand loyalty: behavioural and attitudinal. Behavioural loyalty is the act of repurchasing a certain brand, whereas attitudinal brand

loyalty is the commitment to a brand based on a distinctive value associated with the brand (Jacoby and Chestnut, 1978; Chaudhuri and Holbrook, 2001). Both forms of loyalty are directly related to the brand itself and are not universal to all brands. This thesis, however, is concerned with a different type of brand loyalty, trait brand loyalty. Trait brand loyalty, like brand signalling, varies across people. It measures the extent to which a person's personality is likely to be brand loyal. Whereas behavioural and attitudinal loyalties are brand-specific, trait brand loyalty is person-specific. A scale to measure trait brand loyalty does not exist in the branding literature, as a result, a scale developed by Raju (1980), will be adapted to test the brand loyalty hypothesis, in the section below.

To summarize this literature review, the menstrual cycle literature presented shows that women's behaviours vary greatly, with regards to mating, relationships, self esteem and consumption, depending on where they fall in their cycle (fertile or luteal). The objective of this thesis is to determine if in addition to these aforementioned menstrual cycle changes, women will also vary in their preferences for certain types of brands. In the next section, hypotheses related to menstrual cycle and brand personalities are presented.

Hypotheses

Based on the literature review in the previous section, four hypotheses relating to menstrual cycle and brand personalities are put forth. Furthermore, three hypotheses accounting for possible moderators are also posited.

Main Effects

Evolutionary theory posits that women are more likely to invest in their physical appearance when they are fertile in order to increase their chances of finding the best mate when conception is possible (Gangestad et al., 2005). Researchers in the field of evolutionary consumption have tried to determine how this investment in appearance translates into consumer choices and actual purchases (Durante et al., 2011; Saad and Stenstrom, 2012). The objective of the current study is to determine if a product's brand personality has an effect on these consumer choices. More specifically, will women prefer brands that signal desired personality traits during their fertile phase? Based on the menstrual cycle literature, these desired personality traits are hypothesized to be 'sexy', 'exciting' and 'sophisticated'.

H1: Women will exhibit greater (lower) preferences for 'sexy' brands on fertile (luteal) days.

H2: Women will exhibit greater (lower) preferences for 'exciting' brands on fertile (luteal) days.

H3: Women will exhibit greater (lower) preferences for 'sophisticated' brands on fertile (luteal) days.

The opposite effect is expected for sincere brands, where women will be more likely to prefer sincere brands when in the luteal rather than the fertile phase. This is because sincere brands signal wholesome, girl-next-door qualities (Aaker, 1997), which may be more embraced by women in the luteal phase of their menstrual cycle. This idea is

based on the fact that previous research has found that women are more likely to prefer home and food related products during this period (Saad and Stenstrom, 2012).

H4: Women will exhibit greater (lower) preferences for 'sincere' brands on luteal (fertile) days.

It is important to note five hypotheses were originally put forth. It was posited that women would also exhibit a preference for brands that signalled 'feminine' traits on fertile days. However, the pretest results revealed that it was best to exclude the feminine personality trait from this study (a full explanation of this decision and the pre-test results can be found in the methodology section).

Moderator Effects

Relationship status has been shown to moderate the menstrual cycle effect on sexual behaviour and intra-sexual competition (Havlicek et al., 2005; Pillsworth et al., 2004). In addition, these previous studies have found stronger ovulatory effects in partnered women than non-partnered women (Havlicek et al., 2005; Pillsworth et al., 2004). Accordingly, the present research will control for relationship status. The literature on menstrual cycle effects and relationship status is somewhat split, as some researchers have found the opposite effect. Namely, that menstrual cycle effects should be stronger for single women because partnered women already have a mate and therefore do not need to attract another (Grammer 2003; Durante et al., 2008; Hill and Durante, 2011) However, the underlying logic for this hypothesis is that single women (from an evolutionary perspective) are always in search of a mate regardless of where they fall in their menstrual cycle. Furthermore, there is a desire for women to seek men for extra-pair

copulations even when partnered. As a result, they may be more likely to use 'sexy'; 'exciting' and 'sophisticated' brand personalities, throughout their cycle.

H5: The menstrual cycle effects on brand trait preferences (H1, H2, H3, and H4) will be strongest (weakest) among women who are in a committed romantic relationship (single).

As was mentioned in the previous section, brand personality studies rarely yield a direct relationship between their independent and dependent variables. Most of these studies include moderators to account for the individual differences of their participants. Therefore, brand signalling and trait brand loyalty are expected to act as moderators.

H6: The menstrual cycle effects on brand trait preferences (H1, H2, H3, and H4) will be strongest (weakest) among women who are high (low) in brand signalling.

Since women are more likely to engage in extra pair mating (i.e., cheat on their long-term partners) when ovulating (Haselton and Miller, 2006; Pillsworth and Haselton, 2006), this suggests that their loyalties are influenced by their menstrual status. If so, it would be of interest to explore if this waxing and waning of sexual loyalty impacts brand loyalty as well.

H7: The menstrual cycle effects on brand trait preferences (H1, H2, H3, and H4) will be strongest (weakest) among women who are low (high) in trait brand loyalty.

In order to test these seven hypotheses a within-subjects experiment, where female university students evaluate all four brand personalities, was conducted utilizing some of the methodological designs presented in the previous branding section. In the next section a full description of the experiment is described.

Methodology

Procedure

To test the seven posited hypotheses, a booklet was designed containing four ads for a fictional brand of sunglasses called *Solita.* Sunglasses were chosen as a target category for several reasons: 1) Sunglasses cannot be categorized as a beautification product, nor do they emphasize any attractive feature of a woman's body. This is an important consideration because previous literature has shown that women are more likely to gravitate toward beautification products during the fertile phase of their menstrual cycle (Durante et al., 2011; Saad and Stenstrom, 2012). Although sunglasses may be considered attractive by some (e.g., women wearing sunglasses may be perceived as glamorous or mysterious), it is important to consider that sunglasses hide a portion of women's faces, as such, their ability to enhance beauty is limited. Furthermore, sunglasses are used for all four ads, therefore, the participants' individual perceptions about sunglasses will be consistent across the four ads. 2) Most young women own sunglasses, as a result, their utility is self-evident. 3) Sunglasses are a publicly consumed product (worn outdoors and on people's faces), which is of relevance to brand signalling (more operative for publicly versus privately consumed goods), a topic covered in this thesis.

This study consists of two parts: an in-class main survey followed by an email sent to those participants who were eligible to continue with the study (i.e., those that responded "no" to using any form of hormonal contraceptive). To aid in the design of the in-class survey, two pretests were conducted. The purpose of these two pretests was to ensure that the stimuli (type of sunglasses, brand name of sunglasses, and sunglasses ads)

used in the in-class survey were free of any possible bias. The first pretest aided in choosing an appropriate model of sunglasses and fictional brand name. It was conducted using an online medium (Survey Monkey) and a snowball sample. The second pretest was used to validate the ads created around the sunglasses and sunglasses brand. This pretest, similar to the main survey, was carried out using an in-class survey and a random sample of female undergraduate students. The results of the two pretests are presented in the "Development of Stimuli" section.

Participants for Main Study

With professors' permission, an in-class survey was administered to female undergraduate students (n = 601) at Concordia University, aged 17- 40 (M_{age} = 21.77). Three dollars were given as remuneration. Participants were informed that the survey being administered was part of a study designed to gather young women's attitudes toward brands. Prior to completing the survey, the participants were advised that it contained various lifestyle related questions, including some of a personal nature. The participants were also advised that by accepting to participate in the study they would be required to answer a one-minute follow-up email three weeks later.

Eligibility

Once all the data for the main study were gathered through the in-class surveys, participants who failed to meet specific criteria were dropped. The participants that were included in the study met the following requirements: 1) They responded "no" to the question, "In the last three months have you taken hormonal contraceptives (this might include *The Birth Control Pill*, *contraceptive patch*, *contraceptive injections and NuvaRing*), or emergency contraceptives (this might include *Morning After Pill or Plan*

B)". Participants taking hormonal contraceptives were excluded from the study because these prevent ovulation from occurring and thus ovulatory effects cannot be accurately observed (cf. Adams et al., 1978; Kuukasjaarvi et al., 2004); 2) they were under the age of 35. This was the selected cutoff as a woman's fertility begins to decrease after the age of 35 (Dunson et al., 2002); and 3) they reported having cycles that were consistently regular (25-36 day cycles) over the course of the past six months. This is an important consideration because issues of accuracy arise when predicting fertility status, if women are irregular or have longer than average cycles (Wilcox et al. 2000).

Although the original sample consisted of 601 participants, through filtering (participants who didn't meet one or more of the latter three criteria) and menstrual cycle estimation the total number of eligible participants was narrowed down to 143 (23.79%) (see Table 2 for the breakdown of excluded participants). Menstrual cycle phase estimation is discussed in greater detail in the next section.

Menstrual Cycle Phase Estimation

Ovulation can be predicted using several methods: the reverse-cycle-day (RCD) method, urinary based tests, blood tests, and salivary tests (Guida et al., 1999). For this study, the RCD method was chosen in order to estimate where each participant fell in her cycle. This method was preferred because it is the most non-invasive yet reliable option, and it has been successfully used in past studies (cf. Gangestad and Thornhill, 1998; Haselton and Gangestad, 2006; Pillsworth et al., 2004).

According to the RCD method, the day of ovulation is estimated to occur 15 days prior to the first day of menstruation, regardless of a woman's cycle length. Using this method, participants' fertile phases/windows were identified as RCD 14 to 21, which on

the 28-day cycle calendar shown below (Table 1) corresponds to days 8 to 15. The luteal phases/windows were identified as RCD 1 to 11, which correspond to days 18 to 28, on a 28-day cycle (Wilcox et al., 2000; Saad and Stenstrom, 2012).

Table 1: Menstrual Cycle Calendar

Day 1 Beginning of Menses	**Day 2**	**Day 3**	**Day 4**	**Day 5** End of Menses
Day 6	**Day 7**	**Day 8** Beginning of Fertile Phase	**Day 9**	**Day 10**
Day 11	**Day 12**	**Day 13**	**Day 14** Ovulation	**Day 15** End of Fertile Phase
Day 16	**Day 17**	**Day 18** Beginning of Luteal Phase	**Day 19**	**Day 20**
Day 21	**Day 22**	**Day 23**	**Day 24**	**Day 25**
Day 26	**Day 27**	**Day 28** End of Luteal Phase	**Day 1** Beginning of Menses	**Day 2**
Day 3	**Day 4**	**Day 5** End of Menses	**Day 6**	**Day 7**

The main survey included a calendar whereby participants were asked to indicate their most recent menstrual cycle. The date for the second menstrual cycle was obtained via the follow up email. A second menstrual cycle date was needed because the RCD method is effective for calculating a woman's fertile window after the fact but cannot be used to predict future fertile windows (Wilcox et al., 2000). As can be seen in Table 2, calculations were performed to ensure that the self reported menstrual cycle dates

provided by the participants corresponded to what actually occurred. If a discrepancy was identified, the participant was dropped.

Table 2: Breakdown of Study Sample

Number of Subjects		Explanation
601		Number of properly filled out surveys, prior to filtering
312		Number of women who used a form of hormonal contraception (hence dropped)
289		Number of women who were contacted with a follow-up email, because they were not on any form of hormonal contraception
187		Number of women who responded to the follow-up email
29		Number of women who answered the follow-up email, but reported either not having a second menstrual cycle and/or were not regular (hence dropped)
158		Number of women, who answered the email, reported having a second menstrual cycle and reported having regular cycles
143		Participants who actually had a regular menstrual, based on calculations performed by the researcher. Calculations were performed to ensure that there was no discrepancy between the information provided by the participants and what actually occurred. For example, a women would be filtered out if she reported being regular with a 28-day cycle, but gave her second menstrual cycle as March 19th, when she reported her first as February 4th, meaning that she actually had a 44-day cycle rather than a 28-day cycle.
41: fertile	54: luteal	Participants who fell into the fertile and luteal windows, determined by the Menstrual Cycle Phase estimation calculation (48 women fell outside of the fertile and luteal windows)

Development of Stimuli

Two pretests were designed and executed to aid in the development of the stimuli that would be used in the main survey. The first pretest was designed to choose a fictional brand name for the sunglasses and appropriate sunglasses style (i.e. aviator, rectangle, oval or square). In the first pretest (n = 32), an online survey and snowball sample of female respondents was employed. Female respondents were not compensated for their participation. The female respondents were asked to determine the likeability (7-point scale) of six fictional brand names (Reflecta, Solita, Hestia, Sunna, Reflectus and Girasol,) and the likeability of four sunglasses models. The six fictional brand names were invented by the researcher because they seemed the most likable and appropriate for a sunglasses company. Furthermore, the four models were chosen because they were different from one another and fell into four distinct sunglasses categories (aviator, rectangle, oval or square). Likeability was measured because it is important that the sunglasses' brand name and model be moderately liked to facilitate the manipulation of brand preferences. As a result, the name/sunglasses model that emerged with a likeability closest to four (the midpoint) on a seven-point scale would be considered neutral. This method was also employed by Swaminathan et al. (2009). Once the data was collected, a one-sample t-test was conducted for each brand name and sunglasses model to determine whether the each mean was different from four. With a neutral likeability (mean closest to four) the fictional name "*Solita*" (M = 4.28) emerged as the most suitable brand name. While, Ray Ban 4126 sunglasses (M = 3.97) (Model 4 in Table 3) appeared to be the most neutral of the four tested sunglasses models (Appendix A, Exhibit 1). As can be

seen in Tables 3 and 4, Model 4 (Rayban 4126) and *Solita*, have *p*-values > 0.05, meaning that they are not significantly different from four.

Table 3: Likeability Results of Sunglasses Models

Sunglasses Model	Mean Likeability	*T*-value	*P*-value
Model 1	4.62	2.361	0.025
Model 2	3.66	-1.232	0.227
Model 3	5.19	5.049	0.000
Model 4	**3.97**	**-0.093**	**0.926**

Table 4: Likeability Results of Brand Names

Fictional Brand Name	**Mean Likeability**	**T-value**	**P-value**
Reflecta	3.56	-1.453	0.156
Solita	**4.28**	**.921**	**0.364**
Hestia	3.06	-3.186	0.003
Sunna	3.19	-3.084	0.004
Reflectus	2.94	-3.727	0.001
Girasol	2.62	-4.479	0.000

Once the sunglasses' brand name and model were selected, five ads were designed to elicit specific brand personalities. Five print ads (soft, sensual, thrilling, luxurious and meaningful) each representing distinct brand personalities (feminine, sexy, exciting, sophisticated, and sincere) were designed and tested (Appendix B).

The feminine brand trait was chosen based on the work of Grohmann (2009) to test for brand gender. The brand personalities 'exciting', 'sophisticated', and sincere were chosen from Aaker's (1997) taxonomy of five brand personalities. Aaker's two other brand personalities (competence and ruggedness) were excluded because they were deemed to have little relevance with regards to the postulated ovulatory effects. Previous research on ovulatory effects have found that women focus more on their physical appearance when fertile (Durante et al. 2011; Haselton et al., 2007; Saad and Stenstrom, 2012), as a result it would seem counterintuitive to include dimensions that measured the personalities of competence (reliable, intelligent) and ruggedness (outdoorsy, tough) (Aaker, 1999). Furthermore, Grohmann (2009) found that the ruggedness dimension was closely associated with masculinity, which is not a desired trait for women when attempting to attract an ideal mate. Including these dimensions (ruggedness and competence) might be better suited as a follow up study to the one reported here. The sexy dimension was selected based on the findings that highly fertile women are more attentive to stimuli of a sexual nature (Krug et al., 2000), and that women are more likely to gravitate towards sexy clothes and accessories when fertile (Haselton et al., 2007). Given this evidence it seems logical to include a dimension to account for brand sexiness.

The ads were designed following a procedure similar to that used by Aaker et al. (2004) and Swaminathan et al. (2009). The same pair of sunglasses (Ray Ban model #

4126) and layout was used for all five ads. Brand personalities were manipulated using taglines, pictures, and font type. Each ad contained four pictures and a background. The tag lines in the 'feminine', 'sexy', 'exciting', 'sophisticated', and 'sincere' conditions were respectively: "enjoy the *softer* side of life," "enjoy the *sensual* side of life," "enjoy the *thrilling* side of life," "enjoy the *luxurious* side of life," and "enjoy the *meaningful* side of life." Each ad (soft, sensual, thrilling, luxurious and meaningful) contains one background photo, and four additional photos, laid out in a collage design. The models in the ad pictures were all female, around the same age as the participants (18-35). No children or elderly people were included because it was important that the ad be as relevant as possible to the participants. Also, pictures of men were omitted from the ads, to avoid any potential bias. As was seen in the mating literature, women are likely to search out men more so when in the fertile phase of their menstrual cycle then when in their luteal phase. The photos, taglines and type fonts for the 'exciting', 'sophisticated', 'sincere', and 'feminine' dimensions were selected by the researcher with the help of the descriptions found in Aaker (1997) and Grohmann (2009). Aaker (1997) describes the 'exciting' dimension as daring and spirited, the 'sophisticated' dimension as charming and upper-class, and the 'sincere' dimension as wholesome, honest, and down to earth. Grohmann (2009) describes the 'feminine' dimension as fragile, graceful, and sweet. The definition for the 'sexy' construct was developed by the author and a PhD student, because unlike the other four conditions (exciting, sophisticated, sincere, and feminine) there was no other point of reference in the brand personality literature. For this study the 'sexy' dimension is defined as sensual, flirtatious and seductive. Rather than pretesting each image and tagline for the five dimensions individually, two graduate students (the

author and a PhD student) selected the images and taglines for each dimension, and the five complete ads (soft, sensual, thrilling, luxurious, and meaningful) were pretested to ensure that they each projected the intended brand personality (feminine, sexy, exciting, sophisticated, and sincere).

An element that was given much consideration for the ad design was whether or not the depicted female models should be wearing the Ray Ban sunglasses. The photos used by Swaminathan et al. (2009) did not have models wearing the shoes/watches they used as their target categories. However, in the current context, the complete omission of sunglasses from the images ran the risk of the ads being perceived as fake or unprofessional. Therefore, to preserve the real-world authenticity of the ads, sunglasses were added to one model in every ad (Appendix A, Exhibit 3). The goal of this ad design was to ensure that each element of the ad (tagline, picture, font type) would influence the perception of the fictional *Solita* brand.

A second pretest was carried out to verify that each ad (feminine, sexy, exciting, sophisticated, and sincere) conferred the *Solita* brand with the intended brand personality. This pretest was designed as a manipulation check to ensure that the ads being used in the main survey were signalling their intended brand personality. The second pretest, unlike the first, was distributed in classrooms to female students ($n = 40$) and remuneration was provided in the form of chocolate. The female participants were asked to rate their agreement (strongly disagree to strongly agree) that a given ad matched a list of five personality traits (7-point scale): "If *Solita* chooses to run this ad, to what extent do you agree that the following traits would describe the *Solita* brand?". Each participant was asked to rate their agreement for all five ads. These five ads are labelled as follows:

sensual, soft, thrilling, luxurious, and meaningful. Their corresponding brand traits are labelled: sexy, feminine, exciting, sophisticated, and sincere.

The data collected from the second pretest were analyzed in two ways. First, a series of repeated-measures ANOVAs were conducted to determine how one brand personality trait (e.g., sexy) scored for each of the five ads (sensual, soft, thrilling, luxurious and meaningful). Where, the'sexy' trait is expected to score highest for the sensual ad. Second, another series of repeated-measures ANOVAs were conducted to determine how one ad (e.g., sensual) scored for all five brand personality traits (sexy, feminine, exciting, sophisticated, and sincere). Where, the sensual ad is expected to be rated as more 'sexy' then 'feminine', 'exciting', 'sophisticated', 'sincere'. To further clarify, the first analysis was a between-ads comparison for each brand personality trait, and the second was a within-ad comparison with all five traits.

For the first series of repeated-measures ANOVAs conducted, participants found *Solita* to be significantly more 'sexy' when they were shown the sensual (sexy) ad than when they were shown the soft (feminine), thrilling (exciting), luxurious (sophisticated) and meaningful (sincere) ads (M_{sexy} = 6.35; $M_{feminine}$ = 3.60; $M_{exciting}$= 3.15; $M_{sophisticated}$ = 5.05; $M_{sincere}$ = 2.48; F= 88.99, p-values for the four paired comparisons < 0.0125, [Bonferroni correction was used for the four pair-wise comparisons: 0.05(alpha)/4=0.0125]). When shown the thrilling (exciting) ad, *Solita* was considered to be more 'exciting' than when shown the soft (feminine), sensual (sexy), luxurious (sophisticated), and meaningful (sincere) ads ($M_{exciting}$= 6.08; $M_{feminine}$ = 2.93; M_{sexy} = 4.55; $M_{sophisticated}$ = 4.30; $M_{sincere}$ = 3.15, F= 45.18, the p-values for all four comparisons < 0.0125). When shown the luxurious (sophisticated) ad, *Solita* was rated as more

'sophisticated' than when shown the soft (feminine), sensual (sexy), thrilling (exciting) and meaningful (sincere) ads ($M_{sophisticated}$ = 6.03; $M_{feminine}$ = 4.53; M_{sexy} = 3.38; $M_{exciting}$= 3.03; $M_{sincere}$ = 3.28, F= 36.46, the p-values for all four comparisons < 0.0125). When shown the meaningful (sincere) ad, *Solita* was rated to be more 'sincere' than when shown the sensual (sexy), thrilling (exciting) and luxurious (sophisticated) ads ($M_{sincere}$ = 5.25; $M_{feminine}$ = 4.80; M_{sexy} = 2.85; $M_{exciting}$= 4.43; $M_{sophisticated}$ = 4.13, F= 22.27, the p-values for all four comparisons < 0.0125). However, the soft (feminine) ad was not found to be significantly more 'sincere' than the meaningful (sincere) ad ($M_{feminine}$ = 4.80; F= 22.27; p-value for feminine > 0.0125). According to this finding the soft ad was seen by the participants to be as 'sincere' as the meaningful ad. It was expected that the 'feminine' ad would be less 'sincere' than the meaningful ad. Given this result, the 'feminine' brand personality had to be removed from the study. Participants did find *Solita* to be significantly more 'feminine' when they were shown the soft (feminine) ad than when they were shown the thrilling (exciting), and meaningful (sincere) ad ($M_{feminine}$ = 6.25; $M_{exciting}$= 3.80; $M_{sincere}$ = 5.10; F= 44.18 ; p-values for exciting and sincere comparisons < 0.0125). However, *Solita* was not found to be significantly more 'feminine' when participants were shown the sensual and luxurious ads (M_{sexy} = 5.93; $M_{sophisticated}$ = 5.98; p-values for sexy and sophisticated > 0.0125). This finding further supports the decision to remove the soft ad from the study. In sum, the results of these ANOVA tests highlight that each ad with the exception of the soft ad, did an effective job at projecting the desired corresponding brand personality. The 'feminine' brand personality was not significantly different for the sensual and luxurious ads. Nor, was the soft ad considered to be significantly more 'sincere' than the meaningful ad.

The second set of ANOVAs, presented below, also confirm the decision to remove the 'feminine' brand trait from this study. These series of ANOVAs were run on each ad (soft, sensual, thrilling, luxurious and meaningful) to ensure that the individual ad design elicited the desired brand personality (feminine, sexy, exciting, sophisticated and sincere for the Solita brand. When shown the soft (feminine) ad, participants found *Solita* to be significantly more 'feminine' than 'sexy', 'exciting', 'sophisticated' and 'sincere' ($M_{feminine}$ = 6.25; M_{sexy} = 3.60; $M_{exciting}$= 2.93; $M_{sophisticated}$ = 4.53; $M_{sincere}$ = 4.80, F= 56.09, the p-values for all four comparisons < 0.0125). When shown the sensual (sexy) ad, participants found *Solita* to be significantly more 'sexy' than 'exciting', 'sophisticated' and 'sincere', but not significantly more 'sexy' than 'feminine' (M_{sexy} = 6.35; $M_{feminine}$ =5.93; $M_{exciting}$= 4.55; $M_{sophisticated}$ = 3.38; $M_{sincere}$ = 2.85, F= 74.73, the p-value for feminine > 0.0125). When shown the thrilling (exciting) ad, participants found *Solita* to be significantly more 'exciting' than 'feminine', 'sexy', 'sophisticated', and 'sincere' ($M_{exciting}$= 6.08; $M_{feminine}$ = 3.80; M_{sexy} = 3.15; $M_{sophisticated}$ = 3.03; $M_{sincere}$ = 4.43, F= 52.92, the p-values for all four comparisons < 0.0125). When shown the luxurious (sophisticated) ad, participants found *Solita* to be significantly more 'sophisticated' than 'sexy', 'exciting' and 'sincere' but not significantly more 'sophisticated' than 'feminine' ($M_{sophisticated}$ = 6.02; $M_{feminine}$ = 5.98; M_{sexy} = 5.05; $M_{exciting}$= 4.30; $M_{sincere}$ = 4.13, F= 31.06, the p-value for feminine > 0.0125. When shown the meaningful (sincere) ad, participants found *Solita* to be significantly more sincere then 'sexy', 'exciting' and 'sophisticated' but, again, not significantly more 'sincere' than 'feminine' ($M_{exciting}$= 3.15; $M_{feminine}$ =5.10; M_{sexy} = 2.48; $M_{sophisticated}$ = 3.28; $M_{sincere}$ = 5.25, F= 39.49, the p-value for feminine > 0.0125.

In summary, via both sets of ANOVAs that were run, it appears that the presence of the soft (feminine) ad (dimension), causes confusion when paired with the sensual (sexy), luxurious (sophisticated), and meaningful (sincere) ads (dimensions). Therefore, to avoid any potential confounds in the main survey, the soft (feminine) ad (dimension) was excluded from the main survey (see Exhibit 2 for the feminine ad that was removed). And, the hypothesis testing the relationship between femininity and menstrual effects was dropped. The reason for this non-significance may be attributed to the fact that the 'sexy', 'sophisticated', and 'sincere' images also exhibited feminine qualities. Although, it is important to test femininity as a separate dimension from those developed by Aaker (1997), the femininity dimension may be better suited as a follow-up study to the one presented in this thesis.

Main Survey

Part One

The main survey was seventeen pages long and took approximately ten minutes to complete (see Appendix C). Four versions (A, B, C, D) of the survey were created. In order to control for possible order effects, each version contained all four ads but in a different order.

Dependent Variables

To measure participants' preferences for particular brand personality traits (H1, H2, H3, H4), attitude toward the ad (Aad), attitude toward the brand (Abr), and purchase intention (Pi) items were selected. The scales were designed in line with those used by Mackenzie and Spreng (1992) and Grohmann (2009). Participants were asked to respond to three scales (seven-point semantic differential) for each ad (sexy, 'exciting',

sophisticated, and sincere). The first two dependent variables (Aad and Abr) contained three items each, and the third scale contained two items: (1) "What is your overall evaluation of this ad?" (negative/positive, dislike/like, unfavorable/favorable) (2) "If *Solita* chooses to run this ad, what would your overall evaluation of the *Solita* brand be?" (negative/positive, dislike/like, unfavorable/favorable) (3) "If *Solita* chooses to run this ad, how likely are you to purchase the *Solita* brand in the near future?" (unlikely/likely, improbable/probable). For the data analysis, the scores of the three items for attitude towards the ad and attitude towards the brand, and the scores of the two items for purchase intention are collapsed into three aggregate scores (one for each dependent variable). In addition to indicating their level of agreement to the above items, participants were also required to rank the four ads, in order of preference ('1' being the most preferred and '4' being the least preferred). This was done to determine which ads women preferred the most and least, and to gauge if there would be a difference in responses as a function of the sequential (viewing one ad at a time) versus simultaneous (viewing all four ads at once) presentation of the ads. For example, if an ovulating woman gave a six out of seven to the 'sexy', 'sophisticated' and 'exciting' ad, the ranking question would require the woman to choose her favorite ad of the four, second favorite of the four and so on.

Moderating Variables

Relationship status, brand signaling, and trait brand loyalty are individual differences that might affect the postulated relationships as posited in H1, H2, H3 and H4, and thus were taken into consideration.

In order to measure the extent to which relationship status affects brand trait preferences (H5), four questions were designed. One yes/no question was included to determine a participant's relationship status ("Are you in a committed romantic relationship?"). If the participant responded "yes" to being in a relationship, three additional questions were asked to determine the length and type of the relationship. The first question required a numerical response ("for how many months?"); the second question gauged a participant's felt security in the relationship using a seven-point scale ("How secure do you feel in your relationship?"), with "not at all secure" and "very secure" as the anchors. And, the third question (seven-point scale) asked the participant to indicate "how committed are you to your relationship?" with "not at all committed" and "very committed" as the anchors.

These relationship status questions were included to control for variability in participants' relationship behaviours. For example, two women may answer "yes" to being in a relationship. However, if the duration of their relationships varies greatly (e.g., one month versus twenty-four months) as does their level of commitment to their respective relationships (3 versus 7, on the seven- point scale), their attitudes towards the brand might vary accordingly. In addition, if a woman has been in a relationship for years but responds "not at all secure" in her relationship, she may behave more like an unattached person than someone in a long-term relationship.

Brand signaling (H6) was assessed using a four-item scale designed by Park and Roedder-John (2010). Participants were asked to rate their agreement ('strongly disagree' to 'strongly agree') on a seven-point scale for each of the following items: "I use brands to make a better impression on other people, "I use brands to communicate who I am to

other people, “I use brands to feel more positive about myself”, and “I use brands to reflect on who I am”. The sixth hypothesis posits that there will be a difference between high and low brand signalers. As such, the participants’ scores are categorized into three groups. Participants whose scores, on the four-item scale, fall within the 25th percentile or lower on the brand signalling scale are classified as “low” brand signalers, and those whose scores fall in the 75th percentile or higher are categorized as “high” brand signallers. Participants whose scores fall between the 25th and 75th percentile are placed in the “other” category. The data for women placed in this “other” category will not be used to test H6 as only high and low brand signallers are of interest to this hypothesis.

Trait Brand loyalty (H7) was measured using a seven-item brand switching scale developed by Raju (1980). Participants were asked to rate their agreement (‘strongly disagree’ to ‘strongly agree’) on a seven-point scale for each of the following items: “I enjoy sampling different brands of commonplace products for the sake of comparison, “I would rather stick with a brand I usually buy than try something I am not very sure of”, “If I like a brand, I rarely switch from it just to try something different”, “I get bored with buying the same brands even if they are good”, “A lot of the time I feel the urge to buy something really different from the brands I usually buy, “If I did a lot of flying, I would probably like to try all the different airlines, instead of flying just one most of the time”, and “I enjoy exploring several different alternatives or brands while shopping”. To analyze the data for this hypothesis, participants are categorized in “high”, “low”, and “other” groups (similar to H6). Participants whose scores, on the seven-item scale, fall in the 75th percentile or higher are placed in the “high” brand loyalty group and the participants whose scores fall in the 25th percentile or lower are placed in the “low” brand

loyalty group. The "other" group contains the responses of those participants that have scores that fall between the 25th and 75th percentile. This hypothesis was designed to test only the "high" and "low" brand loyalty groups, therefore, the data for the "other" group will not be analyzed for this hypothesis.

Demographic variables were also included in the survey (age, field of study, ethnic group, and full-time versus part-time of study). These questions were placed between the brand-related questions and the menstrual cycle questions as filler questions to minimize the likelihood that the participants might piece together the true nature of the study. Otherwise, the demographic data will not be analyzed.

As a side note, the survey contained several additional dependent variables that are outside the scope of this thesis (e.g., estimating the caloric totals of various photographed meals). These data were collected for a separate project and hence will not be discussed any further here.

Part Two

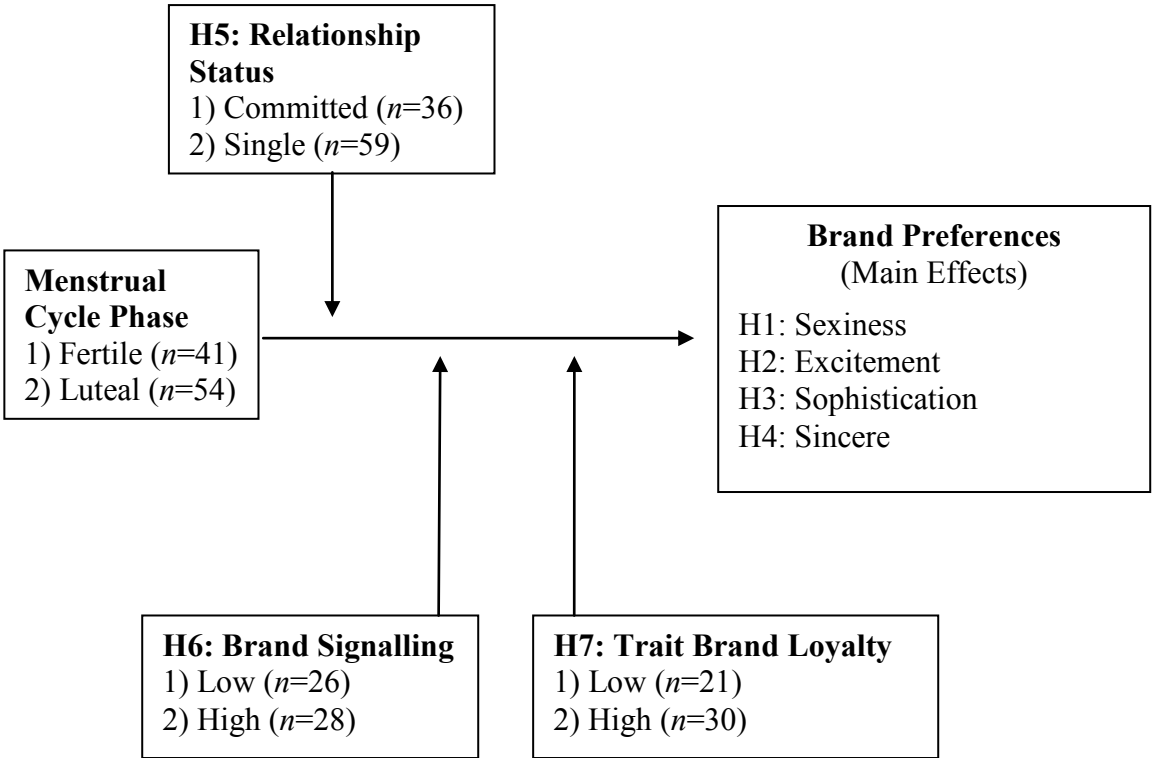
As was previously mentioned, 289 participants were contacted with a follow-up email (Appendix D). A Gmail account was set up with the address: "inclassbrandingstudy@gmail.com". The follow-up email contained three questions: "1) what is the date of the first day of your most recent menstrual period?", "2 a) In the last 6 months, have you had regular monthly menstrual cycles (each cycle lasting between 25 and 36 days)?", "2 b) How many days do your menstrual cycles (not periods) typically last, on average (over the last 6 months)?". Using the responses to these questions, the *menstrual cycle phase estimation* was then calculated. Unfortunately, problems arose with this method of surveying in the form of emails bouncing back, and unanswered

emails. Those participants who did not respond to the emails were emailed a total of five times, before attempts to contact them were discontinued. Having laid out the details of the methodological design, the next section presents the results from the collected data.

Analyses and Results

Statistical tests were run, on the seven posited hypotheses. The main effects implicit to H1, H2, H3, H4, were tested using one way ANOVAs, while the moderators covered in H5, H6, H7, were tested using multivariate ANOVAs. Figure 2 below depicts the relationships between the independent variables, the moderators, and dependent variables in this study.

Figure 2: Hypotheses Diagram



Menstrual Cycle Phase

Using the participants' self reported dates, the data analyses were carried out by classifying women into one of two groups: fertile, and luteal. As was previously explained in the methodology section, participants' fertile phase (light gray area in Table 1) was identified as RCD 14 to 21, which on the 28-day cycle calendar shown below

(Table 1) corresponds to days 8 to 15. Their luteal phase (darker gray area in Table 1) were identified as RCD 1 to 11, which correspond to days 18 to 28 on a 28-day cycle (Wilcox et al., 2000; Saad and Stenstrom, 2012). Menstrual cycle is the independent variable for this study, which consists of two levels: fertile and luteal.

Main Effects

The main effects were tested using one way ANOVAs. Given that only two groups are being compared for H1to H4, an independent t-test or a one way ANOVA could have been used to measure the variance in means of the two conditions. However, a one way ANOVA was chosen over a t-test for consistency, since multivariate ANOVAs were used to test the moderator effects (H5, H6 and H7). It is important to note that an independent t-test was also performed for H1 to H4 to ensure that the results were the same for both tests.

For H1, H2, H3 and H4, recall that each ad (sensual, thrilling, luxurious, and meaningful) was evaluated along three dependent variables, namely attitude toward the ad (Aad), attitude toward the brand (Abr), and purchase intention (PI) using the following set of questions: (1) "What is your overall evaluation of this ad?" (negative/positive, dislike/like, unfavorable/favorable) (2) "If *Solita* chooses to run this ad, what would your overall evaluation of the *Solita* brand be?" (negative/positive, dislike/like, unfavorable/favorable) (3) "If *Solita* chooses to run this ad, how likely are you to purchase the *Solita* brand in the near future?" (unlikely/likely, improbable/probable). The sub-items for each question (e.g., negative/positive, dislike/like, unfavorable/favorable etc.) were combined into one aggregate score and a one way between subjects ANOVA was run for each of the three scores (to test H1, H2, H3, and H4). In order to be able to

collapse the sub-items into one score, a Cronbach analysis was performed for the sub-items of each question. The resulting values were high, all sub-items within each of the three dependent variables (attitude towards the ad, attitude towards the brand, and purchase intention) for each brand personality (sexy, 'exciting', sophisticated and sincere) indicate a high level of internal consistency for the scales (averaging 0.97, all higher than 0.92). The totals of each sub-item are labelled "dependent variables" in the tables below. These three dependent variables apply to each of the main effects hypotheses (H1, H2, H3, and H4) and each of the moderator effects hypotheses (H5, H6 and H7).

Menstrual Cycle Phase and the 'Sexy' Brand Personality (H1)

The first hypothesis (H1) posits that women would exhibit greater (lower) preferences for sexy brands on fertile (luteal) days. The results from the three sexy dependent variables ($n_{fertile}$= 41; n_{luteal}= 54) show that the means across the two menstrual phases were statistically equal ($p > 0.05$ for all three dependent variables). When fertile, women do not significantly prefer sexy brands more so than their counterparts in the luteal phase. In fact, as can be seen from Table 5 below, "attitude towards the brand" is marginally significant in the opposite direction to that hypothesized (p=0.079). The luteal mean for "attitude towards the brand" (M_{luteal} = 4.32) is higher than the fertile mean for "attitude towards the brand" ($M_{fertile}$ = 3.74), as a result, the directionality of the relationship is opposite to what was posited. A possible explanation for this occurrence will be address in the discussion section.

Table 5: ANOVA Results for 'Sexy' Brand Personality

Dependent Variable	$Mean_{Fertile}$	$Mean_{Luteal}$	F-value	P-value
Attitude towards the ad	3.96	4.37	1.574	0.213
Attitude towards the brand	3.74	4.32	3.158	0.079
Purchase Intention	3.02	3.47	1.522	0.220

Menstrual Cycle Phase and the 'Exciting' Brand Personality (H2)

The second hypothesis (H2) posits that women would also exhibit greater (lower) preferences for 'exciting' brands on fertile (luteal) days. This did not turn out to be the case, as fertile women did not significantly prefer the ad or brand in the 'exciting' condition ($p > 0.05$ for all three dependent variables). Table 6 below shows the specific results of the statistical tests performed.

Table 6: ANOVA Results for 'Exciting' Brand Personality

Dependent Variable	$Mean_{Fertile}$	$Mean_{Luteal}$	F-value	P-value
Attitude towards the ad	4.54	4.85	1.181	0.280
Attitude towards the brand	4.48	4.78	1.050	0.308
Purchase Intention	3.48	3.77	0.685	0.410

Menstrual Cycle Phase and the 'Sophisticated' Brand Personality (H3)

The third hypothesis (H3) posits that women would exhibit greater (lower) preferences for sophisticated brands on fertile (luteal) days. Women were not found to significantly prefer 'sophisticated' brands more so when fertile than when in the luteal phase ($p > 0.05$ for all three dependent variables). See Table 7 for additional details regarding the statistical results.

Table 7: ANOVA Results for 'Sophisticated' Brand Personality

Dependent Variable	$Mean_{Fertile}$	$Mean_{Luteal}$	F-value	P-value
Attitude towards the ad	5.11	5.22	0.128	0.722
Attitude towards the brand	5.08	5.25	0.322	0.572
Purchase Intention	4.15	4.38	0.392	0.533

Menstrual Cycle Phase and the 'Sincere' Brand Personality (H4)

The fourth hypothesis (H4) posits that women would exhibit greater (lower) preferences for sincere brands on luteal (fertile) days. Women in the luteal phase of their menstrual cycle did not significantly prefer the 'sincere' brand more than those in their fertile phase ($p > 0.05$ for all three dependent variables). Table 8 below offers a summary of the statistical details.

Table 8: ANOVA Results for 'Sincere' Brand Personality

Dependent Variable	$M_{Fertile}$	M_{Luteal}	F-value	P-value
Attitude towards the ad	4.39	4.09	0.874	0.352
Attitude towards the brand	4.37	4.32	0.028	0.868
Purchase Intention	3.09	3.13	0.016	0.900

In summary, all four hypotheses (H1-H4) were disconfirmed, thus providing unequivocal support against the postulated main effects. Although, the main effects were found to be non-significant, an additional statistical analysis was conducted using the Mann-Whitney U test, to gauge the results from the ranking question in the main survey. This question asked participants to evaluate all four ads at once rather than one at a time. The next section, presents the results from this question.

Preference Rankings of the Four Ads

As was mentioned in the methodology section, in addition to measuring the responses (attitude towards the ad, attitude towards the brand and purchase intention) for each individual ad (sensual, thrilling, luxurious, and meaningful) participants were also asked to rank the four ads in order of preference ('1' being the most preferred and '4' being the least preferred). This question was included to determine which ad participants preferred the most and least. Recall that H1, H2, H3 posit that women will prefer the 'sexy', 'exciting', and 'sophisticated' brand personality respectively when in the fertile phase of their menstrual cycle, while H4 posits that women would prefer the 'sincere' brand personality when in the luteal phase. Had the main effects been significant, this ranking question could have helped in determining which of the four ads participants preferred the most when fertile, and which ads the participants preferred the least when in the luteal phase.

A Mann-Whitney U-test is a non-parametric test and should be used when two samples are (1) statistically independent, namely results from one sample do not affect the results of another sample (i.e., fertile and luteal in the current case); (2) the observations of the dependent variable are ordinal (rankings in the current case); and (3) the sample size must be greater than 20. Unlike an ANOVA or t test that compare variances between two means, the Mann-Whitney U test compares variance between the ranks of two groups (Nachar, 2008). As a result, a Mann-Whitney U-test was selected because it was deemed to be the best statistical tool to analyze the data collected for the ranking question ($n_{ranking}$= 92). From Table 9, it can be seen that the mean ranks for fertile and luteal are similar for all four ads. Therefore, the sensual, thrilling, luxurious, and

meaningful ads were not found to be significantly different across the two menstrual cycle conditions ($p > 0.05$ for all four ads). Note that a low *U* score (close to zero) indicates a difference between medians; given the scores below, the *U* scores are too high to indicate a significant difference.

Table 9: Mann-Whitney U results for Ranking of Ads

Preference Ranking	Mean Rank		Mann-Whitney U	Z score	P-value
	Fertile	Luteal			
Sensual (Sexy)	2.82	2.77	1005	-0.235	0.814
Thrilling (Exciting)	2.46	2.36	976.5	-0.468	0.640
Luxurious (Sophisticated)	1.97	1.98	1014	-0.161	0.872
Meaningful (Sincere)	2.74	2.89	964	-0.567	0.567

Moderator Effects

A multivariate ANOVA was conducted to test the three posited moderators (relationship status, brand signalling, and brand loyalty), and was chosen because it effectively tests for variances between two or more groups of means. Furthermore, a multivariate ANOVA is a good tool for discovering if there is an interaction between the menstrual cycle phase (fertile, luteal), and one of the moderators (relationship status, brand signalling, or brand loyalty) for attitude towards the ad, attitude towards the brand, and purchase intention of each brand personality (sexy, exciting, sophisticated, and sincere). It has already been established that there is no significant difference for the various brand personalities across the two menstrual phases (H1, H2, H3 and H4). Testing for relationship status, brand signalling, and brand loyalty, as moderators, may

provide an interaction between two seemingly unrelated variables. Similar to the way the data was separated by brand trait for H1, H2, H3 and H4, multivariate ANOVAs were run for each brand trait (sexy, exciting, sophisticated, and sincere) of H5, H6, and H7. The sections below present the results for these hypotheses.

Menstrual Cycle Phase and Relationship Status for the Brand Personality Traits (H5)

The fifth hypothesis predicted that menstrual cycle effects on brand trait preferences (sexy, exciting, sophisticated, and sincere would be strongest (weakest) among women who are in a committed (single) romantic relationship. To test this hypothesis the sample (n=95) was separated into two groups: partnered and single. Those participants who answered 'yes' to the question, "Are you in a committed romantic relationship?" were placed in the partnered group ($n_{partnered}$= 36) and those who responded 'no' were placed in the single group (n_{single}= 59). For this hypothesis an interaction is sought between menstrual cycle phase (fertile, luteal), relationship status (single, partnered) on brand personality rating (attitude towards the ad, attitude towards the brand, and purchase intention). Table 11 presents the interaction results when the multivariate ANOVA was conducted on the 'sexy' dimension with relationship status as a moderator. Of the three dependent variables, only one yielded a significant effect, "attitude towards the brand" ($M_{FertilePartnered}$ = 4.39; $M_{FertileSingle}$= 3.28; $M_{LutealPartnered}$ = 4.09; $M_{LutealSingle}$= 4.44); f (1, 94) =5.045, p= 0.027). The other two constructs, "attitude towards the ad" and "purchase intention" yielded a marginally significant interaction (F (1, 94) =3.10, p = 0.082; F (1, 94) =3.261, p = 0.074, respectively).

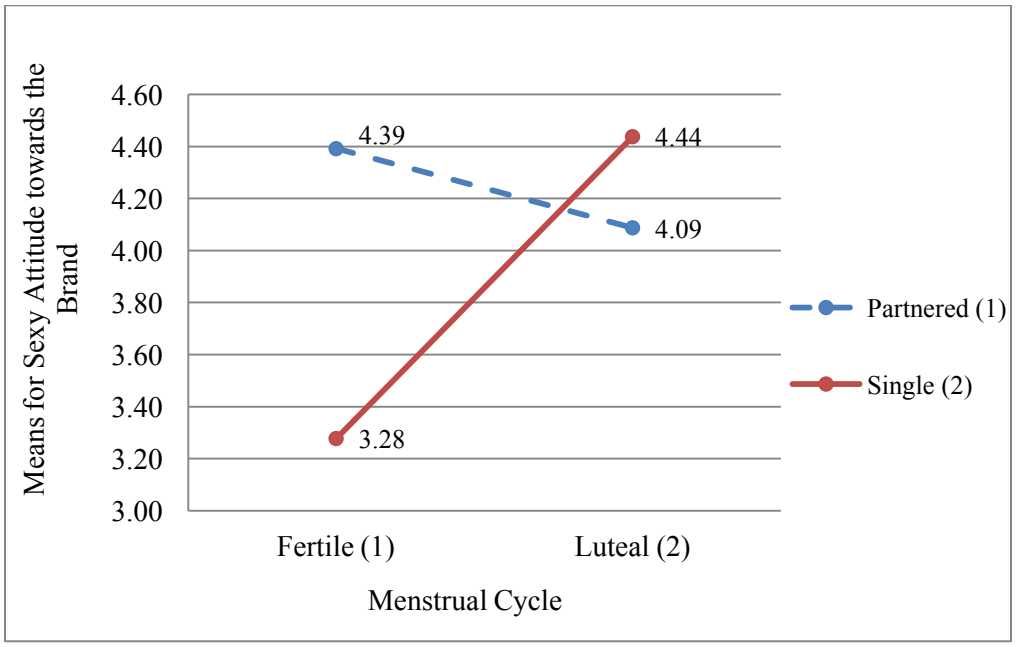
Table 10: Interaction Between Menstrual Cycle Phase and Relationship Status for the 'Sexy' Trait

Dependent Variables	$Mean_{Fertile}$		$Mean_{Luteal}$		F-value	P-value
	Partnered	Single	Partnered	Single		
Attitude towards the ad	4.55	3.54	4.26	4.43	3.100	0.082
Attitude towards the brand	4.39	3.28	4.09	4.44	5.045	**0.027**
Purchase Intention	3.62	2.60	3.26	3.59	3.261	0.074

To further explore these significant interactions, the means for attitude toward the brand of the 'sexy' trait were plotted in Figure 3, and two pairwise comparisons were computed for all three dependent variables. Alpha correction was used for the two pair-wise comparisons: 0.05(alpha)/2=0.025. It is also important to note "marginally significant" refers to p-values that fall within the 0.026 to 0.05 range. The pairwise comparisons in this paper's results section were computed by keeping one of the variables constant and running a one way ANOVA on the other two variables. For example, (referring to Figure 3 below) to test for a significant difference between the means 4.39 (mean responses of fertile/partnered women, for attitude towards the 'sexy' brand) and 4.09 (mean responses of luteal/partnered women for attitude towards the 'sexy' brand), the data for partnered women were isolated and a one way ANOVA was run on menstrual cycle phase and attitude toward the 'sexy' brand, for only the partnered women. The other four possible pairwise comparisons were not computed because they were not hypothesized comparisons. Furthermore, running too many comparisons would have rendered the alpha too small, as it would have had to be divided by six (to adjust for the familywise error rate).

The pairwise comparisons compared the fertile and luteal means for single women and then the fertile and luteal means for partnered women. The interaction between menstrual cycle phase and relationship status on attitude towards the 'sexy' brand is driven by the fact that single women had significantly more negative attitudes towards the brand during the fertile phase compared to during the luteal phase (M_{Fertile} = 3.28; M_{Luteal}= 4.44; F (1, 58) =8.427, p = 0.005). Additionally, single women in the fertile phase of their menstrual cycle are also driving a negative feeling (marginally significant) towards the ad (M_{Fertile} = 3.54; M_{Luteal}= 4.43; F (1, 58) =4.298, p = 0.043), and negative feelings (marginally significant) towards purchase intention (M_{Fertile} = 2.60; M_{Luteal}= 3.59; F (1, 58) =5.170, p = 0.027). These means and interaction results were opposite to what was posited. It was expected that partnered women would prefer the 'sexy" brand traits on fertile days more so than luteal days. However, this effect was not found, rather, single women disliked the 'sexy' brand trait on fertile days more so than on luteal days and there was no effect for partnered women ($p > 0.10$ for all three dependent variables).

Figure 3: Interaction Between Menstrual Cycle Phase and Relationship Status for the 'Sexy' Trait (Attitude Towards the Brand)



Relationship status as a moderator for the relationship between menstrual cycle and the remaining brand traits, 'exciting', 'sophisticated', and 'sincere' was non-significant ($p > 0.05$ for all three dependent variables). Tables 12, 13, and 14 below, present the breakdown of results for the interaction analysis performed.

Table 11: Interaction Between Menstrual Cycle Phase and Relationship Status for the 'Exciting' Trait

Dependent Variables	$Mean_{Fertile}$		$Mean_{Luteal}$		F-value	P-value
	Partnered	Single	Partnered	Single		
Attitude towards the ad	4.82	4.33	4.60	4.99	2.199	0.142
Attitude towards the brand	4.65	4.36	4.58	4.90	0.961	0.330
Purchase Intention	3.59	3.40	3.32	4.01	1.500	0.224

Table 12: Interaction Between Menstrual Cycle Phase and Relationship Status for the 'Sophisticated' Trait

Dependent Variables	$Mean_{Fertile}$		$Mean_{Luteal}$		F-value	P-value
	Partnered	Single	Partnered	Single		
Attitude towards the ad	5.45	4.88	5.26	5.19	0.729	0.395
Attitude towards the brand	5.35	4.89	5.25	5.25	0.597	0.442
Purchase Intention	4.35	4.00	4.16	4.51	0.782	0.379

Table 13: Interaction Between Menstrual Cycle Phase and Relationship Status for the 'Sincere' Trait

Dependent Variables	$Mean_{Fertile}$		$Mean_{Luteal}$		F-value	P-value
	Partnered	Single	Partnered	Single		
Attitude towards the Ad	4.41	4.38	3.95	4.17	0.156	0.694
Attitude towards the brand	4.43	4.33	4.04	4.48	0.674	0.414
Purchase Intention	3.29	2.94	2.95	3.32	0.772	0.382

Menstrual Cycle Phase and Brand Signalling for the Brand Personality Traits (H6)

The sixth hypothesis (H6) posited that menstrual cycle effects on brand trait preferences (sexy, exciting, sophisticated, and sincere) would be strongest (weakest) among women who are high (low) in brand signalling ($n_{signalling} = 95$). In order to test this hypothesis, multivariate ANOVAs were run. Prior to performing the statistical analyses, the participants had to be separated into high and low brand signaling groups. Brand signaling was assessed using a four-item scale designed by Park and Roedder-John (2010), the responses from the four-item scale were averaged ($\alpha = 0.88$) and the highest and lowest responses were placed in their respective groups. The participants whose

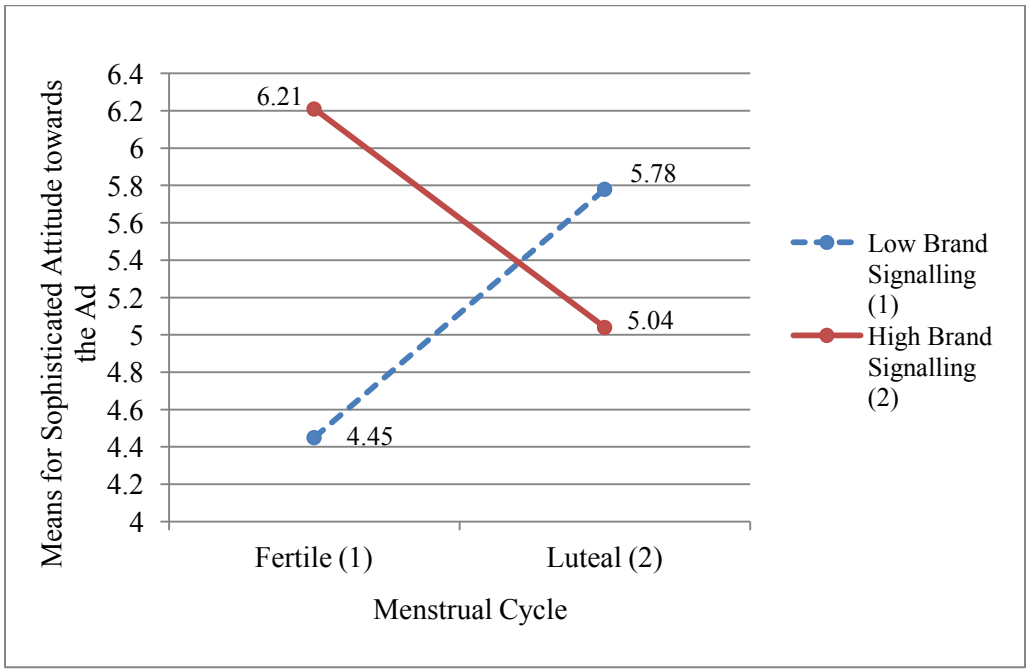
scores fell into the 25th percentile or lower on the brand signalling scale were classified as "low" brand signalers ($n_{\text{low signaling}}$ =26) and the participants whose scores fell in the 75th percentile or higher were classified as "high" brand signallers ($n_{\text{high signalling}}$ =28). This method is preferred over a median split because it is important that participants whose responses fall around the median not be classified as either high or low brand signallers. The goal of this 75/25 split is to ensure that the truly high and low brand signallers are identified. Furthermore, an 80/20 split or a 90/10 split was not used because the number of participants in the high and low conditions would have fallen below 20. The high/low placement of participants also caused a reduction in the number of participants in the fertile and luteal conditions (n_{fertile}=25; n_{luteal}=29).

Table 14 presents the interaction results for the multivariate ANOVA conducted on the 'sophisticated' dimension with brand signalling as a moderator. All three of the dependent variables, "attitude towards the brand" (F (1, 53) =13.211, p= 0.001), "attitude towards the ad" (F (1, 53) =9.716, p = 0.006), and "purchase intention" (F (1, 53) =8.296, p = 0.003) are significant. The means for attitude toward the ad of the 'sophisticated' trait are plotted in Figure 4.

Table 14: Interaction Between Menstrual Cycle Phase and Brand Signalling for the 'Sophisticated' Trait

Dependent Variables	$\text{Mean}_{\text{Fertile}}$		$\text{Mean}_{\text{Luteal}}$		F-value	P-value
	Low	High	Low	High		
Attitude towards the ad	4.45	6.21	5.78	5.04	13.211	**0.001**
Attitude towards the brand	4.50	5.94	5.72	4.98	9.715	**0.003**
Purchase Intention	3.14	5.73	4.33	4.15	8.296	**0.006**

Figure 4: Interaction Between Menstrual Cycle Phase and Brand Signalling for the 'Sophisticated' Trait (Attitude Towards the Ad)

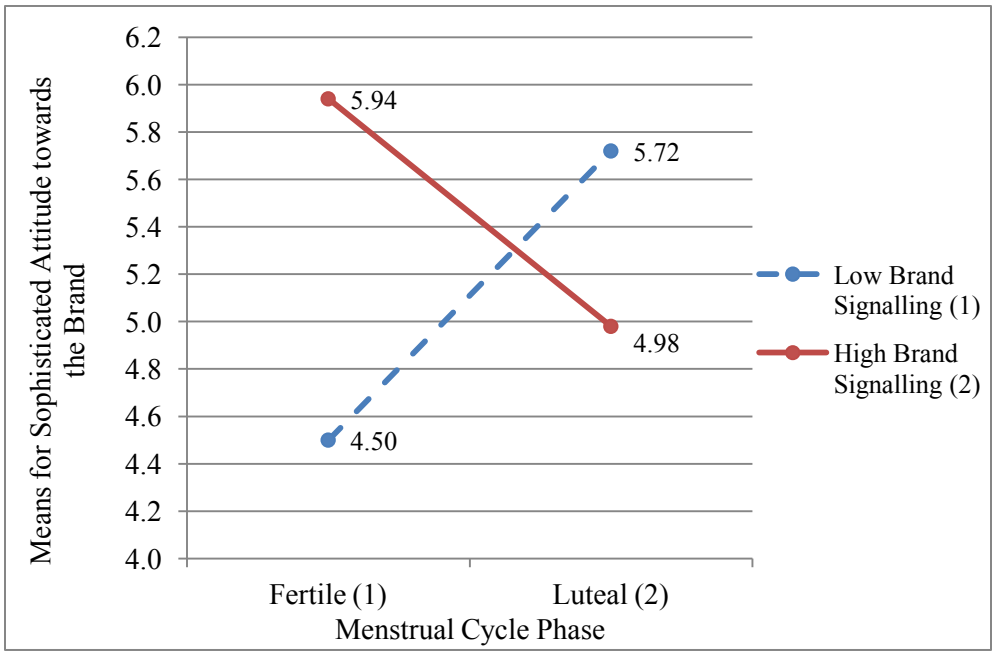


Similar to the procedure used for the H5, two pairwise comparisons were run to identify the differences between the fertile and the luteal means (recall: the cutoff is 0.025 as 0.05(alpha)/2=0.025). The pairwise comparisons show that the interaction between menstrual cycle phase and brand signalling on attitude towards the 'sophisticated' ad is driven by two significant mean differences. First, as predicted in H6, high brand signalling women are more likely to prefer (marginally significant) the 'sophisticated' *Solita* ad in the fertile phase of their menstrual cycle than in the luteal phase of their menstrual cycle ($M_{\text{Fertile}} = 6.21$; $M_{\text{Luteal}} = 5.04$; $F\ (1, 27) = 5.806$, $p = 0.027$). Second, low brand signallers are more likely to prefer the 'sophisticated' *Solita* ad when in the luteal phase of their menstrual cycle than when in the fertile phase ($M_{\text{Fertile}} = 4.45$; $M_{\text{Luteal}} = 5.78$; $F\ (1, 25) = 7.478$, $p = 0.012$). While the significant menstrual cycle effect on preferences for the 'sophistication' dimension among high brand signallers was

posited in H6, the fact that low brand signallers preferred the sophisticated ad during the luteal phase more than during the fertile phase was not anticipated.

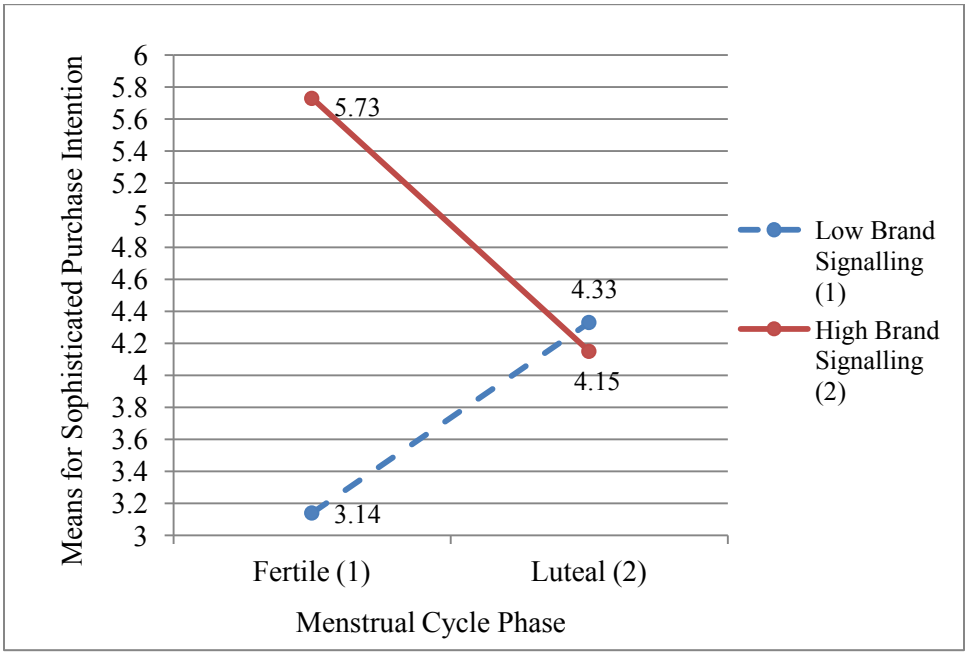
Although, there was an interaction between menstrual cycle and brand signalling on attitude towards the 'sophisticated' brand, there were no significant mean differences for attitude towards the 'sophisticated' *Solita* brand. The means for attitude towards the brand are plotted in Figure 5. Pairwise comparisons show that high brand signalling women are not more likely to prefer the 'sophisticated' *Solita* brand in the fertile phase of their menstrual cycle than in the luteal phase of their menstrual cycle ($M_{\text{Fertile}} = 5.94$; $M_{\text{Luteal}} = 4.98$; $F\ (1, 27) = 5.806$, $p = 0.06$). However, the findings for attitude towards the brand are in a similar direction to those findings for attitude towards the 'sophisticated' ad. Additionally, low brand signallers are more likely to prefer (marginally significant) the 'sophisticated' *Solita* brand when in the luteal phase of their menstrual cycle ($M_{\text{Fertile}} = 4.50$; $M_{\text{Luteal}} = 5.72$; $F\ (1, 25) = 5.617$, $p = 0.026$).

Figure 5: Interaction Between Menstrual Cycle Phase and Brand Signalling for the 'Sophisticated' Trait (Attitude Towards the Brand)



With regards to the purchase intention dependent variable for the 'sophisticated' brand, the pairwise comparisons show that high brand signallers are more likely to purchase (marginally significant) the 'sophisticated' *Solita* sunglasses when in the fertile phase of their menstrual cycle than in the luteal phase ($M_{Fertile}$ = 5.73; M_{Luteal}= 4.15; F (1, 27) =5.776, p = 0.026). The means for purchase intention are plotted in Figure 6. The second statistically significant mean difference that was present with the other two dependent variables was not replicated for the purchase intention variable. Low brand signallers were not more likely to purchase the 'sophisticated' *Solita* sunglasses in the luteal phase of their menstrual cycle ($M_{Fertile}$ = 3.14; M_{Luteal}=4.33; F (1, 25) =2.859, p =0.10).

Figure 6: Interaction Between Menstrual Cycle Phase and Brand Signalling for the 'Sophisticated' Trait (Purchase Intention)



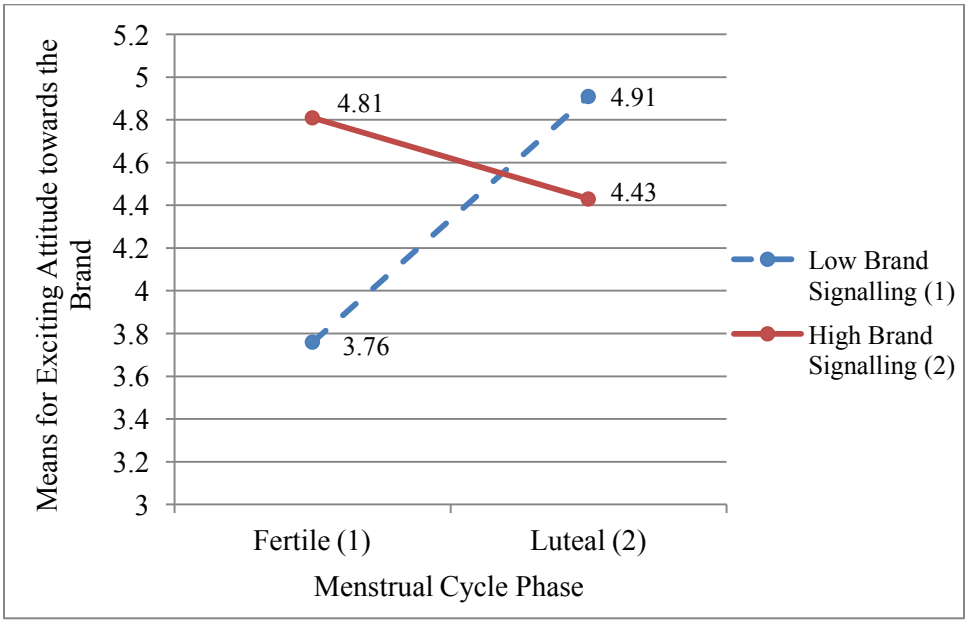
In addition to a significant interaction between menstrual cycle phase and brand signalling for the 'sophisticated' trait, there was a marginally significant interaction between menstrual cycle and brand signalling for attitude towards the brand for the

'exciting' trait *(F* (1, 53) =3.074, *p*= 0.060). The means for attitude towards the brand for the 'exciting' trait are plotted in Figure 7. The other two dependent variables (attitude towards the ad and purchase intention) for the 'exciting' trait were not significant (*p*-values > 0.10).

Table 15: Interaction Between Menstrual Cycle Phase and Brand Signalling for the 'Exciting' Trait

Dependent Variables	$Mean_{Fertile}$		$Mean_{Luteal}$		F-value	P-value
	Low	High	Low	High		
Attitude towards the ad	3.86	5.06	4.69	4.73	2.345	0.132
Attitude towards the brand	3.76	4.91	4.81	4.43	3.704	0.060
Purchase Intention	2.61	4.09	3.08	3.26	2.168	0.147

Figure 7: Interaction Between Menstrual Cycle Phase and Brand Signalling for the 'Exciting' Trait (Attitude Towards the Brand)



Pairwise comparisons were run and results show that low brand signalling women did not prefer the 'exciting' *Solita* brand more so when in the luteal phase of their

menstrual cycle than when in their fertile phase ($M_{Fertile}$ = 3.76; M_{Luteal}=4.81; f (1, 25) =3.920, p =0.059). No menstrual cycle effects were found for high brand signalling women and the 'exciting' *Solita* brand ($M_{Fertile}$ = 4.91; M_{Luteal}=4.43; f (1, 27) =0.666, p =0.422). The direction of the results was contrary to what was predicted. It was expected that high brand signallers would prefer the 'exciting' dimension, more so on their fertile days than on their luteal days.

There was no evidence of an interaction between menstrual cycle phase (fertile, luteal), and brand signalling (high, low) for the 'sexy' and 'sincere' brand trait preferences ($p > 0.05$ for all three dependent variables). Tables 16 and 17 present the multivariate ANOVAs for these traits.

Table 16: Interaction Between Menstrual Cycle Phase and Brand Signalling for the 'Sexy' Trait

Dependent Variables	$Mean_{Fertile}$		$Mean_{Luteal}$		F-value	P-value
	Low	High	Low	High		
Attitude Towards the Ad	3.38	4.76	3.53	4.69	0.070	0.792
Attitude towards the brand	3.05	4.76	3.64	4.43	1.364	0.248
Purchase Intention	2.11	4.50	2.38	3.56	1.942	0.170

Table 17: Interaction Between Menstrual Cycle Phase and Brand Signalling for the 'Sincere' Trait

Dependent Variables	$Mean_{Fertile}$		$Mean_{Luteal}$		F-value	P-value
	Low	High	Low	High		
Attitude towards the ad	4.67	4.21	4.53	3.88	0.052	0.821
Attitude towards the brand	4.45	4.21	4.81	4.16	0.237	0.629
Purchase Intention	3.04	3.18	2.92	3.06	0.000	0.997

Main Effects between Brand Signalling and Brand Personality Traits

Along with the interaction effects reported above, several main effects were uncovered between brand signalling and the dependent variables. These main effects are not part of H6, but are worth reporting nonetheless. For the 'sophisticated' personality trait there is a main effect between brand signalling and purchase intention (M_{low}=3.39, $M_{high=}$4.77; (F (1, 53) =6.215, p = 0.016). In addition, there are significant main effects of brand signalling for the 'sexy' dependent variables along all three dependent measures: attitude towards the ad (M_{low}=3.45, $M_{high=}$4.71; (F (1, 53) =9.519, p = 0.003), attitude towards the brand (M_{low}=3.32, $M_{high=}$4.56; (F (1, 53) =10.144, p = 0.002), and purchase intention (M_{low}=2.23, $M_{high=}$3.93; (F (1, 53) =16.996, p = 0.000). Finally, a marginally significant main effect for brand signalling was uncovered for purchase intention for the 'exciting' trait (M_{low}=2.83, $M_{high=}$3.59; (F (1, 53) =3.544, p = 0.066).

Menstrual Cycle Phase and Brand Loyalty for the Brand Personality Traits (H7)

The seventh and final hypothesis (H7) expected that the menstrual cycle effects on brand trait preferences for the 'sexy', 'exciting', 'sophisticated', and 'sincere' traits would be strongest (weakest) among women who are low (high) in trait brand loyalty. To test this hypothesis the sample (n=95) needed to be separated in two groups: high and low. In order to do this, those responses that fell in the 25th percentile on the 7-point scale were considered to have low trait brand loyalty ($n_{low\ loyalty}$=21) and those participants whose responses fell above the 75th percentile, where considered to be high in trait brand loyalty ($n_{high\ loyalty}$=30). The sample size for this condition was reduced to 51, as the responses of 44 participants fell somewhere between the 25th and 75th percentile. Similarly to H6, this method was used because it is much more stringent than a median

split in truly isolating those who score high or low on this construct. The reduction of participants from 95 to 51 for the brand loyalty condition also caused a reduction in participants for the luteal and fertile conditions ($n_{fertile}$=23; n_{luteal}=28). To measure trait brand loyalty a seven-item scale was adapted from Raju (1980), the ratings from each item were averaged and used to place participants in the high and low groups. Internal reliability was established by Cronbach's α calculated on the seven items for brand loyalty (α=0.677). The four multivariate ANOVAs run on the data yielded no statistical evidence to support the hypothesis of an interaction between menstrual cycle, and brand loyalty, for each of the four brand personalities. Tables 18, 19, 20, and 21 demonstrate that the *p*-values of all three dependent variables for all four conditions are far above the accepted cut off (*p*-values > 0.10). The following section discusses the results presented and some of the limitations that may have led to the null hypotheses.

Table 18: Interaction Between Menstrual Cycle Phase and Brand Loyalty for the 'Sexy' Trait

Dependent Variables	$Mean_{Fertile}$		$Mean_{Luteal}$		F-value	P-value
	Low	High	Low	High		
Attitude towards the ad	3.73	4.33	4.54	4.35	0.792	0.378
Attitude towards the brand	3.70	4.05	4.49	4.41	0.241	0.626
Purchase Intention	2.65	3.12	3.68	3.18	1.041	0.313

Table 19: Interaction Between Menstrual Cycle Phase and Brand Loyalty for the 'Exciting' Trait

Dependent Variables	$Mean_{Fertile}$		$Mean_{Luteal}$		F-value	P-value
	Low	High	Low	High		
Attitude towards the ad	4.49	4.15	5.27	4.61	0.034	0.855
Attitude towards the brand	4.80	4.13	5.15	4.43	0.004	0.953
Purchase Intention	3.50	2.89	4.32	3.18	0.281	0.598

Table 20: Interaction Between Menstrual Cycle Phase and Brand Loyalty for the 'Sophisticated' Trait

Dependent Variables	$Mean_{Fertile}$		$Mean_{Luteal}$		F-value	P-value
	Low	High	Low	High		
Attitude towards the ad	5.30	4.51	5.67	5.02	0.031	0.861
Attitude towards the brand	5.50	4.44	5.39	5.06	0.799	0.376
Purchase Intention	4.59	3.38	4.77	4.09	0.196	0.660

Table 21: Interaction Between Menstrual Cycle Phase and Brand Loyalty for the 'Sincere' Brand Trait

Dependent Variables	$Mean_{Fertile}$		$Mean_{Luteal}$		F-value	P-value
	Low	High	Low	High		
Attitude towards the ad	4.23	4.54	4.36	4.10	0.407	0.527
Attitude towards the brand	4.50	4.44	4.52	4.33	0.016	0.900
Purchase Intention	2.95	3.23	3.32	2.74	0.824	0.369

To summarize the results presented in the 'analyses and results' section, H1 through H4 were refuted. For relationship status as a moderator (H5) an effect was found between single women and the fertile phase of their menstrual cycle. Single women preferred the *Solita* brand significantly more so on luteal days than in their fertile days.

This interaction was also marginally significant for attitude towards the ad and purchase intention. With the addition of brand signalling as a moderator (H6) there are significant effects along the 'sophisticated' dimensions. More specifically, high brand signalling women preferred (marginally significant) the "sophisticated' *Solita* ad more so on fertile days than on luteal days. In addition, this positive attitude towards the 'sophisticated' *Solita* ad translated to (marginally significant) purchase intention, where high brand signallers had greater purchase intentions in the fertile phase than in the luteal phase. High brand signalling women in the fertile phase of their menstrual cycle did not prefer the 'sophisticated' Solita brand more so than in the luteal phase of their menstrual cycle. The opposite effect was found for low brand signalling women, where they preferred the 'sophisticated' *Solita* brand more so on luteal days than on fertile days. Finally, there were no significant interactions between menstrual cycle phase and brand loyalty on any of the three brand-related dependent measures (H7). Table 22 below provides an overview of the results separated by hypotheses.

Table 22: Summary of Results Separated by Hypotheses

Main Effects	Results
H1: Women will exhibit greater (lower) preferences for 'sexy' brands on fertile (luteal) days.	Women were not found to significantly prefer 'sexy' brands more so on fertile days than luteal days ($p > 0.05$ for all three dependent variables).
H2: Women will exhibit greater (lower) preferences for 'exciting' brands on fertile (luteal) days.	Women were not found to significantly prefer 'exciting' brands more so on fertile than on the luteal days ($p > 0.05$ for all three dependent variables).
H3: Women will exhibit greater (lower) preferences for 'sophisticated' brands on fertile (luteal) days.	Women were not found to significantly prefer 'sophisticated' brands more so on fertile than on the luteal days ($p > 0.05$ for all three dependent variables).

H4: Women will exhibit greater (lower) preferences for 'sincere' brands on luteal (fertile) days.	Women were not found to significantly prefer 'sincere' brands more so on luteal than on the fertile days ($p > 0.05$ for all three dependent variables).
H5: The menstrual cycle effects on brand trait preferences (H1, H2, H3, and H4) will be strongest (weakest) among women who are in a committed romantic relationship (single).	An interaction between menstrual cycle and relationship status was found for the 'sexy' brand trait. Pairwise comparisons show: Single women disliked (marginally significant) the 'sexy' ad ($p = 0.045$) and brand ($p = 0.005$) more so on fertile days than luteal days. This dislike was reflected (marginally significant) in purchase intention as well ($p = 0.027$).
H6: The menstrual cycle effects on brand trait preferences (H1, H2, H3, and H4) will be strongest (weakest) among women who are high (low) in brand signalling.	An interaction between menstrual cycle and relationship status was only found for the 'sophisticated' and 'exciting' brand traits. Pairwise comparisons for the 'sophisticated' brand show: (1) High brand signalling women preferred (marginally significant) the "sophisticated' *Solita* ad ($p = 0.027$) more so on fertile days than on luteal days. Purchase intention for the 'sophisticated' brand was also marginally significant ($p = 0.032$). Although, the results for attitude towards the 'sophisticated' brand were in the right direction, women did not prefer the 'sophisticated' *Solita* brand more so on their fertile days than luteal days ($p = 0.06$). (2) An opposite, non-hypothesized, effect was found for low brand signalling women, where they preferred the 'sophisticated' *Solita* ad ($p = 0.012$) and (marginally significant) brand ($p = 0.026$) more so on luteal days than on fertile days.
	Pairwise comparisons for the 'exciting' brand show: (1) Low brand signalling women did not prefer the 'exciting' *Solita* brand more so when in the luteal phase of their menstrual cycle than when in their fertile phase ($p = 0.059$), however, the findings reflect a directionality similar to that of the "sophisticated' ad. (2) No menstrual cycle effects were found for high

	brand signalling women and the 'exciting' *Solita* brand.
H7: The menstrual cycle effects on brand trait preferences (H1, H2, H3, and H4) will be strongest (weakest) among women who are low (high) in trait brand loyalty.	There was no statistical evidence to support the hypothesis of an interaction between menstrual cycle, and brand loyalty on any of the four brand traits (p-values > 0.10 for all dependent variables).

Discussion

Researchers have established that the hormones that fluctuate during the fertile and luteal phase of a woman's menstrual cycle influence her choices and purchases in food, clothing, and beautification product categories (Durante et al., 2008; Durante et al., 2011; Haselton et al., 2007; Saad and Stenstrom, 2012). However, this paper is the first of its kind in exploring how hormonal changes across the menstrual cycle might influence brand preferences within a given product category. Although no main effects of menstrual cycle on brand preferences were found, the current research is the first to establish a link between menstrual cycle phase, trait brand signalling, and preferences for certain brand traits ('sophisticated' and 'exciting'), as well as the association between menstrual cycle phase, relationship status, and preferences for 'sexy' brands.

The significant interaction between menstrual cycle and brand signalling for the 'sophistication' trait is a novel contribution. As was predicted, women who score high in brand signalling preferred (marginally significant) the 'sophisticated' *Solita* ad more when in the fertile phase of their menstrual cycle than when in the luteal phase. Furthermore, this preference translated to a marginally significant purchase intention for the 'sophisticated' *Solita* sunglasses. This particular finding is the first indication of how women use brands to signal their mate viability around ovulation. Lens et al. (2011) explored a related issue, namely women's use of brands to evaluate mate viability, by documenting a relationship between menstrual cycle and high status products. The products used to test their hypotheses were consumer goods that men might typically buy to signal their mate fitness to women (e.g., Breitling watch, Porsche, Aston Martin). In contrast, this thesis looks at women's preferences for a 'sophisticated' ad and brand and

their likelihood of purchasing said brand for themselves (it is important to note that Aaker (1997) defines sophistication as upper class and successful, similar to the high status construct tested by Lens et al. (2011)). These two findings differ in that one draws conclusions about how a woman gauges mate viability (Lens et al. study) and the other draws conclusions about how a woman signals her own mate viability (this thesis).

What might motivate women to want to signal their mate viability through a 'sophisticated' brand? Men and women tend to select mates who are similar to themselves on a range of physical, demographic, and attitudinal characteristics (Buss and Barnes, 1986; Nemechek and Olson, 1999; Thiessen and Gregg, 1980). Given this form of assortative mating, the underlying logic for the significant interaction (menstrual cycle and brand signalling on the 'sophisticated' dimension) is that women will try to project an image of themselves in line with those characteristics they desire in an ideal mate (i.e., women who desire a sophisticated mate will try to signal their own sophistication). This 'image projection' is considered to be more important during the fertile phase of women's menstrual cycles because women look to attract the most suitable mate closer to ovulation (Gangestad and Thornhill 1998; 2008). Whether men actually perceive highly sophisticated women as attractive is something that has yet to be studied and is definitely an interesting avenue for future research.

That women search for mates who hold attitudes similar to theirs also explains the second interaction between menstrual cycle and brand signalling on the 'sophistication' dimension. The results show that low brand signalling women in their fertile phase preferred the 'sophisticated' *Solita* ad and brand less than when in the luteal phase of their menstrual cycle. Low brand signalling women do not use brands to signal

personality traits about themselves. As such, these women may be interested in men that hold the same anti-brand beliefs as them. It is entirely possible that low brand signalling women try to be more vigilant in projecting an anti-brand persona on fertile days than on luteal days in hopes of attracting a desirable man with a similar anti-brand persona.

Aside from the menstrual cycle effects associated with the brand signalling moderator, another moderator, relationship status, yielded a notable menstrual cycle effect along the 'sexy' dimension. Single women preferred the 'sexy' *Solita* brand more so on their luteal days than on their fertile days. It appears women dislike being exposed to a 'sexy' ad and brand while ovulating. Why might this be the case when women have been previously found to prefer sexy attire and accessories when fertile (Durante et al., 2011; Saad and Stenstrom, 2012)? A possible explanation for this occurrence is intrasexual competition. As was mentioned in the literature review, women tend to be more susceptible to intrasexual competition when in the fertile phase of their menstrual cycle (Havlicek et al., 2005; Pillsworth et al., 2004). Durante et al. (2011) discovered that the relationship between their subjects' product choices and their ovulatory cycle was moderated by intrasexual competition. It is possible that the participants in the current study did not perceive the *Solita* brand as a potential accessory for themselves but perhaps saw the women in the *Solita* ad as potential rivals, thereby triggering the corresponding negative attitudes. To conclude this discussion section, the reasoning behind this thesis' findings further support the notion that the Darwinian mating module is quite intricate and many factors (e.g., relationship status, propensity for brand signalling, attitude compatibility) can influence the types of brands women will be

interested in across their menstrual cycle. The next section presents the conclusions of this thesis, its limitations, implications and opportunities for future research.

Conclusions

To conclude this paper, limitations of the current study are discussed, as well as implications of this research (managerial and societal), and opportunities for future research.

Limitations

This thesis hypothesized that there would be a direct relationship between menstrual cycle and brand personalities (H1, H2, H3 and H4). What could have caused the null effects across all four hypotheses, especially when previous studies have found a relationship between menstrual cycle phases and the types of products women consume? In their paper, Saad and Stenstrom (2012) argue that postulated relationships between variables that are causally too far removed from the basic Darwinian mechanisms (i.e., food, mating, survival, etc.) are less likely to yield significant effects. This decreased likelihood stems from the fact that there are other (unknown) variables that could be influencing the posited relationships. The Darwinian mating module is what motivates women in the fertile phase of their menstrual cycle to purchase beautification products and wear sexy clothing (i.e., the causal link is direct). However, there are many factors beyond hormonal fluctuations that affect one's brand preferences. The causal relationship between menstrual cycle phase and brand preferences is not as direct and free of conflating variables as the causal relationship between menstrual cycle phase and sexy clothes. Saad and Stenstrom's latter explanation was supported in the current paper, where no effects were found between menstrual cycle phase and the 'sophisticated' brand personality until a moderating variable, brand signalling, was taking into consideration.

There are numerous intervening (non menstrual cycle) variables that can influence a person's attitude towards a brand (Saad and Stenstrom 2012). For this study, one such conflating variable could have been the use of sunglasses. Sunglasses may not be a desirable product for women looking to accentuate their sex appeal. Sunglasses hide eyes and cover a portion of people's faces. Aside from the age old saying that "eyes are the windows to the soul," there may be a strategic mating advantage for women to keep their eyes uncovered during the fertile phase of their menstrual cycle. Research shows that women are more likely than men to use non-verbal body language as a flirting technique. These non-verbal techniques include eye contact and strategically placed glances (Greer and Buss, 1994). This type of flirting technique is of relevance since women have a tendency to engage in more social and flirtatious behavior when in the fertile phase of their menstrual cycle (Haselton et al. 2007). Consequently, the *Solita* sunglasses, despite their 'sexy' brand personality, may be detrimental to a woman's efforts in showing off her beauty and mate viability. Additionally, sunglasses may not be an effective medium to signal sincerity. 'Sincerity' was the only brand personality of the four that yielded absolutely no effects. Although, the *Solita* sunglasses were rated as having a 'sincere' brand personality when participants were exposed to the meaningful ad, it may be difficult for women to communicate that they are cheerful, honest, down to earth, and wholesome (Aaker, 1997) if their eyes are covered. As a result, a different product should have been used for the 'sexy' and 'sincere' brand personalities. An alternative product choice could be handbags because this accessory can be easily seen by others but does not cover any body parts or hinder interaction with others.

Managerial Implications

Firms invest large sums of money in their marketing strategies, because such strategies have proven to successfully influence sales. However, marketing strategies that do not properly tap into humans' needs and wants will rarely achieve their goals (Kotler et al., 2011). Understanding the ultimate roots of these needs and wants, is a main tenet of evolutionary consumption (Colarelli and Dettmann, 2003; Saad and Gill, 2000; Saad, 2007, Saad, 2011). It is imperative that marketers learn the Darwinian motivations behind their consumers' behaviors, as these generally transcend culture and other social factors (i.e., lifestyle, upbringing, geography, etc.). The research in this thesis can further motivate managers to determine which kind of brand personality their own products project, and target the appropriate group of consumers accordingly. For example, this thesis found that single women in the fertile phase of their menstrual cycle disliked the 'sexy' ad and brand more so than when in the luteal phase of their menstrual cycle. It is believed that this dislike is a result of intrasexual competition where single women in their fertile phase may have felt threaten by the models in the ads. A company who knowingly carries 'sexy' brands can choose a tagline like, "*Solita*, helping you enjoy the sensual side of life" (this tagline is directed at the person reading it), rather than selecting an advertising tagline like, "*Solita*, enjoy the sensual side of life" (a tagline that seems directed to multiple people). This type of positioning could help single (non-partnered) ovulating consumers believe that the advertisement is uniquely directed at them. In adopting this type of positioning the advertiser can attempt to mitigate the effects of intrasexual competition and decrease the likelihood of negative feelings towards the

brand. This outcome would occur because single women would feel the ad is directed at them and not other potential rivals.

Companies that create products to be used in relation to the menstrual cycle (i.e., tampons, sanitary napkins, pain pills, ovulation kits, etc.) would also benefit from this research. There are a variety of ways that product packaging can be manipulated to reflect a certain brand personality. For example, 'sophisticated' packaging has delicate, natural designs and is oftentimes associated with quality (Orth and Malkewitz, 2008). Altering the packaging for menstrual cycle products, could be an effective way for marketers to pursue low brand signallers when in the luteal phase of their menstrual cycle. Low brand signallers would be an important market segment for companies to capture since they are generally less receptive to marketing campaigns.

Societal Implications

The current research is also replete with societal implications. As was mentioned in the introduction, women hold more credit card debt than men, and are more likely to engage in compulsive buying (Dittmar, 2005; Coleman, 2002). A desirable goal for this research (relationship between menstrual cycle and brands) would be to educate women about the potential runaway effects of the mating module as relating to compulsive buying. Runaway effects of adaptive mechanisms occur when behavior rooted in a Darwinian mechanism becomes extreme, for example, if a woman near ovulation were to spend a month's pay check on beautification products. Other examples of runaway effects of adaptive mechanisms include eating disorders (anorexia or compulsive eating), pathological gambling, and sexual addiction (Saad, 2007). The findings in this thesis on 'sophisticated' brand personalities could help young women (less than 35 years of age) to

reflect on the brands they choose on fertile days. Brands with 'sophisticated' personalities tend to also be more expensive (Orth and Malkewitz, 2008). As a result, women who are knowingly high brand signallers could avoid spending more than they can afford for 'sophisticated' brands on fertile days. These women would be able to keep track of what phase they are in (fertile or luteal) through various iphone apps and websites that exist to help women store their menstrual cycle information.

Future Research

The following section discusses the potential for future research within the branding and menstrual cycle research steams.

It would be of interest to explore why single women in the fertile phase of their menstrual cycle disliked the 'sexy' *Solita* ad and brand. If intrasexual competition is truly driving this finding, future research might benefit companies who adopt the "sex sells" strategy when targeting female consumers. A follow up menstrual cycle study could be designed whereby "sexy" ads are rated in their effectiveness by women in their fertile and luteal phases. In this proposed study's design, relationship status and intrasexual competition would be the moderators.

With regards to future research not related to this thesis' findings, two research avenues are purposed. The first research idea moves away from the Darwinian mating module used in this thesis and towards the survival module. A recent study from Japan finds that women are more likely to detect a snake quicker than they detect a flower in the luteal phase of their menstrual cycle (Masataka and Shibasaki, 2012). According to these researchers there exists an "evolved bias for the detection of evolutionarily relevant threatening stimuli" (p. 2), with this detection ability being more pronounced for women

on luteal days. The reason for this heightened sense of awareness is due to the fact that the luteal phase is when a woman's body prepares for gestation. It would be interesting to study how this survival mechanism manifests itself in a consumer setting, perhaps with scare marketing tactics or product recalls. The second research avenue proposes to explore the hormonal effects of pregnant women and marketing. Although pregnant women are not driven by ovulatory effects, they do experience an increase in progesterone levels (Gilbert, 2010). The effects caused by these increased progesterone levels on consumer behavior could prove to be very informative. Furthermore, very little research in marketing has been done on pregnant women as a market segment.

Overall, this thesis was effective in finding links between menstrual cycle and brand personalities. Research in evolutionary psychology and branding continues to evolve. Presently, there are theoretical papers on the relationship between branding and evolutionary psychology (Colarelli and Dettmann 2003; Greenwood and Kahle, 2007; Saad and Gill, 2000), however, this thesis is among the first to test this relationship empirically.

References

Aaker, David A., (1996), *Building Strong Brands*, New York: The Free Press.

Aaker, Jennifer L., (1997), "Dimensions of Brand Personality," *Journal of Marketing Research* 34 (8), 347-356.

Aaker, Jennifer L., (1999), "The Malleable Self: The Role of Self-Expression in Persuasion," *Journal of Marketing Research*, 36 (2), 45-57.

Aaker, Jennifer. L., Veronica Benet-Martinez and Jordi Garolera, (2001), "Consumption of Symbols as Carriers of Culture: A Study of Japanese and Spanish Brand Personality Constructs", *Journal of Personality and Social Psychology,* 81 (3), 492-508.

Aaker, Jennifer L., Susan Fournier, and S. Adam Brasel (2004), "When Good Brands Do Bad", *Journal of Consumer Research*, 31 (1), 1-16.

Aggarwal, Pankaj and Ann L. McGill (2007), "Is That Car Smiling at Me? Schema Congruity as a Basis for Evaluating Anthropomorphized Products," *Journal of Consumer Research*, 34 (4) 468-479.

Azoulay, Audrey and Jean-Noel Kapferer (2003), "Do Brand Personality Scales Really Measure Brand Personality?" *Brand Management,* 11 (11), 143-155.

Adams, David B., Alice R. Gold, and Anne D. Burt, (1978), "Rise in Female-Initiated Sexual Activity at Ovulation and Its Suppression by Oral Contraceptives", *New England Journal of Medicine*, 299 (21), 1145-1150.

Belk, Russell (1988), "Possessions and the Extended Self," Journal of Consumer Research, 15 (9), 139-168.

Brakus, J. J., Schmitt, Bernd H., and Zarantonello, Lia (2009), "Brand Experience: What Is It? How Is It Measured? Does It Affect Loyalty?", *Journal of Marketing,* 73, (5), 52-68.

Brase, Gary, L., and Guy, Emma, C. (2004), "The Demographics of Mate Value and Self-esteem", *Personality and Individual Differences, 36,* 471-484.

Brown, Donald E., (1991), *Human Universals,* New York: McGraw-Hill.

Bui, Khanh T., Peplau, Ann L., and Hill, Chuck T. (1996), "Testing the Rusbult Model of Relationship Commitment and Stability In a 15-Year Study of Heterosexual Couples", *Personality and Social Psychology Bulletin,* 22 (12), 1244-1257.

Buss, David M. and Michael Barnes (1986),"Preferences In Human Mate Selection", *Journal of Personality and Social Psychology*, 50(3), 559-570.

Buss, David, M., and David Schmitt, (1993), "Sexual Strategies Theory: An Evolutionary Perspective on Human Mating", *Psychological Review,* 100 (2), 204-232.

Chaudhuri, Arjun and Morris B. Holbrook (2001), "The Chain of Effects From Brand Trust and Brand Affect To Brand Performance: The Role of Brand Loyalty", *Journal of Marketing* 65 (2), 81-93.

Coleman, Susan (2002), "Consumer Debt: Who's at Risk? Evidence from the 1998 Survey of Consumer Finances," *Academy of Banking Studies Journal*, 1, 39-52.

Colarelli, Stephen M. and Joseph R. Dettmann (2003), "Intuitive Evolutionary Perspectives in Marketing Practices", *Psychology & Marketing, 20*(9), 837-865.

Dennerstein, Lorraine, Gordon Gotts, James B. Brown, Carol A. Morse, Tim M.M. Farley and Alain Pinol (1994), "The Relationship Between The Menstrual Cycle And Female Sexual Interest in Women with PMS Complaints and Volunteers", *Psychoneuroendocrinology*, 19 (3), 293-304.

Dittmar, Helga and John Drury (2000), "Self-Image–Is It In The Bag? A Qualitative Comparison between "Ordinary" and "Excessive" Consumers", *Journal of Economic Psychology*, 21, 109-142.

Dittmar, Helga (2005), "Compulsive Buying–A Growing Concern? An Examination of Gender, Age, and Endorsement of Materialistic Values as Predictors", *British Journal of Psychology*, 96 467-491.

Dunson, David,B., Bernardo Colombo and Donna D. Baird, (2002), "Changes With Age In the Level and Duration of Fertility In the Menstrual Cycle, *Human Reproduction*, 17 (5), 1399-1403.

Durante, Kristina M., Vladas Griskevicius, Norman P. Li, Sarah E. Hill, and Carin Perilloux (2011), "Ovulation, Female Competition, and Product Choice: Hormonal Influences on Consumer Behavior," *Journal of Consumer Research*, 37 (6), 921-934.

Durante, Kristina M., Norman P Li, and Martie G Haselton, (2008), "Changes in Women's Choice of Dress Across The Ovulatory Cycle: Naturalistic and Laboratory Task-Based Evidence," *Personality and Social Psychology Bulletin,* 34 (11), 1451-1460.

Fennis, Bob M., and Ad Th. H. Pruyn (2007), "You Are What You Wear: Brand Personality Influences on Consumer Impression Formation", *Journal of Business Research*, 60 (6), 634-639.

Fitzsimons, Grainne M., Tanya L. Chartrand, and Gavan J. Fitzsimons (2008), "Automatic Effects of Brand Exposure on Motivated Behavior: How Apple Makes You 'Think Different'", *Journal of Consumer Research*, 35 (6), 21-35.

Fournier, Susan (1998), "Consumers and Their Brands: Developing Relationship Theory in Consumer Research", Journal of Consumer Research, 24 (4), 343-353.

Gangestad, Steven W., Jeffry A. Simpson, Alita J. Cousins, Christine E. Garver-Apgar, and P. Niels Christensen (2004), "Women's Preferences for Male Behavioral Displays across the Menstrual Cycle," *Psychological Science*, 15 (5), 203-207.

Gangestad, Stephen W. and Randy Thornhill (1998), "Menstrual Cycle Variation in Women's Preferences for the Scent of Symmetrical Men," *Proceedings of the Royal Society of London B,* 265 (1399), 927-933.

Gangestad, Stephen W. and Randy Thornhill (2008), "Human Oestrus," *Proceedings of the Royal Society of London B*, 275, 991-1000.

Gangestad, Steven W., Randy Thornhill, and Christine E. Garver (2002), "Changes in Women's Sexual Interests and Their Partner's Mate-Retention Tactics across the Menstrual Cycle: Evidence for Shifting Conflicts of Interest," *Proceedings of the Royal Society of London* B, 269, 975-982.

Gangestad, Steven W., Randy Thornhill, and Christine E. Garver-Apgar (2005), "Adaptations to Ovulation," in *The Handbook of Evolutionary Psychology*, ed. David M. Buss, Hoboken, NJ: Wiley, 344-371.

Gao, Leilei, S., Christian Wheeler and Baba Shiv (2008), "The "Shaken Self": Product Choices as a Means of Restoring Self-View Confidence," *Journal of Consumer Research*, 36 (6), 29-38.

Garver-Apgar, Christine E., Steven W. Gangestad, Randy Thornhill, Robert D. Miller, and Jon J. Olp (2006), "Major Histocompatibility Complex Alleles, Sexual Responsivity, and Unfaithfulness in Romantic Couples," *Psychological Science*, 17 (10), 830-835.

Geuens, Maggie, Bert Weijters, and Kristof De Wulf (2009), "A New Measure of Brand Personality", *International Journal of Research in Marketing*, 26 (2), 97-107.

Gilbert, Scott F., (2010), *Developmental Biology* (9th ed.), Sunderland, MA: Sinauer Associates.

Goldberg, Lewis R. (1990), "An Alternative "Description of Personality": the Big-Five Factor Structure", *Journal of Personality and Social Psychology,* 59 (6)*,* 1216-1229.

Goldberg, Lewis R (1992), "The Development of Markers for the Big-Five Factor Structure, *Psychological Assessment,* 4 (1), 26-42.

Grammer, Karl, LeeAnn Renninger, and Bettina Fisher (2004), "Disco Clothing, Female Sexual Motivation, and Relationship Status: Is She Dressed to Impress?" *Journal of Sex Research,* 41 (1), 66-74.

Greenwood, Cary A., Lynn R. Kahle (2007), "Toward an Evolutionary Theory of Marketing: Evolution and Branding", in *New Frontier in Branding: Attitudes, Attachments, and Relationships* ed. Joseph R. Priester, Deborah J. MacInnis and C. Whan Park, Santa Monica: Society For Consumer Psychology, 3-11.

Greer, Arlette E. and David M. Buss (1994), "Tactics for Promoting Sexual Encounters", *Journal of Sex Research*, 31 (3), 185-201.

Grohmann, Bianca (2009), "Gender Dimensions of Brand Personality," *Journal of Marketing Research* 46 (2), 105-119.

Griskevicius, Vladas. Joshua, M. Tybur, Jill M. Sundie, Robert B. Cialdini, Geoffrey F Miller, and Douglas T. Kenrick, (2007), "Blatant Benevolence and Conspicuous Consumption: When Romantic Motives Elicit Strategic Costly Signals." *Journal of Personality and Social Psychology,* 93 (1), 85-102.

Guida, Maurizio, Giovanni A. Tommaselli, Stefano Palomba, Massimiliano Pellicano, Gianfranco Moccia, Costantino Di Carlo and Carmine Nappi, (1999), "Efficacy of Methods For Determining Ovulation In a Natural Family Planning Program", *Fertility and Sterility,*72(5), 900-904.

Ha, Hong-Youl, Swinder, Janda, and Siva, Muthaly, (2010), "Development of Brand Equity: Evaluation of Four Alternative Models", *The Service Industries Journal*, 30 (6), 911-928.

Haselton, Martie and Stephen W. Gangestad (2006), "Conditional Expression of Women's Desires and Men's Mate Guarding across the Ovulatory Cycle," *Hormones and Behavior,* 49 (4), 509-518.

Haselton, Martie. G., Mina Mortezaie, Elizabeth G. Pillsworth, April, Bleske-Rechek and

Frederick, David, A. (2007), "Ovulatory Shifts In Human Female Ornamentation: Near Ovulation, Women Dress To Impress." *Hormones and Behavior,* 51 (1) 40-45.

Haselton, Martie G. and Geoffrey F. Miller (2006), "Women's Fertility across the Cycle Increases the Short Term Attractiveness of Creative Intelligence," *Human Nature*, 17 (1), 50-73.

Havlicek, Jan, S. Craig Roberts, Jaroslav Flegr (2005), "Women's Preference for Dominant Male Odour: Effects of Menstrual Cycle and Relationship Status", *Biology Letters,* 1 (3), 256-259.

Hill, Sarah E. and Kristina M. Durante (2009), "Do Women Feel Worse to Look Their Best? Testing the Relationship between Self-Esteem and Fertility Status across the Menstrual Cycle." *Personality and Social Psychology Bulletin,* 35 (12), 1592-1601.

Hill, Sarah.E., and Kristina M. Durante (2011), "Courtship, Competition, and the Pursuit of Attractiveness: Mating Goals Facilitate Health-Related Risk-Taking and Strategic Risk Suppression in Women", *Personality and Social Psychology Bulletin*, 37(3), 383-394.

Jacoby, Jacob and Robert Chestnut (1978), *Brand Loyalty: Measurement and Management*, New York: Ronald Press.

Kotler, Philip, Gary Armstrong, Peggy H. Cunningham and Valerie Trifts (2011), *Principles of Marketing*, Toronto, ON: Pearson Canada

Krug, Rosemarie, Plihal, W., Fehm, H. L., and Born, J. (2000), "Selective Influence of the Menstrual Cycle on Perception of Stimuli with Reproductive Significance: An Event-Related Potential Study", *Psychophysiology*, 37(1), 111-122.

Kuukasjärvi, Seppo, Eriksson, Peter C. J., Esa Koskela, Mappes, Tapio, Nissinen, Kari

and Rantala, Markus J., (2004), "Attractiveness of Women's Body Odors Over the Menstrual Cycle: The Role of Oral Contraceptives and Receiver Sex", *Behavioral Ecology*, 15(4), 579-584.

Lens, Inge, Karolien Driesmans, Mario Pandelaere and Kim Janssens (2011), "Would Male Conspicuous Consumption Capture the Female Eye? Menstrual Cycle Effects On Women's Attention To Status Products", *Journal of Experimental Social Psychology*, 48(1), 346-349.

Little, Anthony C., Benedict C. Jones, Robert P. Burriss (2007), "Preferences for Masculinity in Male Bodies Change Across the Menstrual Cycle," *Hormones and Behavior,* 51 (5), 633-39.

MacKenzie, Scott B. and Richard A. Spreng (1992), "How Does Motivation Moderate the Impact of Central and Peripheral Processing on Brand Attitudes and Intentions?" *Journal of Consumer Research,* 18 (3), 519-529.

Mandel, Naomi, Petia K. Petrova, and Robert B. Cialdini (2006), "Images of Success and the Preference for Luxury Brands," *Journal of Consumer Psychology*, 16 (1), 57-69.

Masataka N and M. Shibasaki (2012), "Premenstrual Enhancement of Snake Detection in Visual Search in Healthy Women", *Scientific Reports,* 2 (307), 1-4.

Muniz, Albert M., Jr. and Thomas C. O'Guinn (2001), "Brand Community," *Journal of Consumer Research*, 27 (3), 412-432.

Nachar, Nadim (2008), "The Mann-Whitney U: A Test for Assessing Whether Two Independent Sample Come From the Same Distribution", *Tutorials in Quantitative Methods for Psychology*.

Nemechek, Stephanie and Kenneth R. Olson (1999), "Five-Factor Personality Similarity and Marital Adjustment", *Social Behavior & Personality: An International Journal*, 27(3), 309-317.

Oliver, Richard L. (1999), "Whence Consumer Loyalty?", *Journal of Marketing*, 63 (Special Issue), 33-44.

Orth, Ulrich R.and Keven Malkewitz (2008), "Holistic Package Design and Consumer Brand Impressions", *Journal of Marketing,* 72(3), 64-81

Pawlowski, Boguslaw and Jasienska, Grazyna (2005), "Women's Preferences for Sexual Dimorphism In Height Depend on Menstrual Cycle Phase and Expected Duration of Relationship", *Biological Psychology,* 70(1), 38-43.

Park, Kyung Ji and Deborah Roedder John (2010), "Got to Get You Into My Life: Do Brand Personalities Rub Off on Consumers", *Journal of Consumer Research*, 39 (12), 655-669.

Penton-Voak, Ian S., David J. Perrett, Duncan L. Castles, T. Kobayashi, D. Michael Burt, Lindsey K. Murray, and R. Minamisawa (1999), "Menstrual Cycle Alters Face Preference," *Nature,* 399 (6738), 741-42.

Perrett, David I., Michael D. Burt, Ian S. Penton-Voak, Kieran J. Lee, Duncan A. Rowland, and Rachel Edwards (1999), "Symmetry and Human Facial Attractiveness", *Evolution and Human Behavior*, 20, 295-307

Phau, Ian and Gerald Prendergast (2000),"Consuming Luxury Brands: The Relevance of The 'Rarity Principle'", *Journal of Brand Management*, 8 (2), 122-137.

Pillsworth, Elizabeth G., Martie G. Haselton, and David M. Buss (2004), "Ovulatory Shifts in Female Sexual Desire," *Journal of Sex Research,* 41 (1), 55-65.

Pillsworth, Elizabeth G. and Martie G. Haselton (2006), "Male Sexual Attractiveness Predicts Differential Ovulatory Shifts in Female Extra-Pair Attraction and Male Mate Retention," *Evolution and Human Behavior*, 27 (7), 247-258.

Puts, David A. (2005), "Mating Context and Menstrual Phase Affect Female Preferences for Male Voice Pitch," *Evolution and Human Behavior*, 26 (09), 388–397.

Raju, P. S. (1980), "Optimum Stimulation Level: Its Relationship to Personality, Demographics, and Exploratory Behaviour", Journal *of Consumer Research*, 7 (12), 272-281.

Rubenstein, C.R. (1981), "Survey Report on Money", *Psychology Today,* 15 (5)*,* 24-44.

Rucker, Derek D. and Adam D. Galinsky (2008), "Desire to Acquire: Powerlessness and Compensatory Consumption," *Journal of Consumer Research,* 35 (8), 257-267.

Saad, Gad (2006), "Applying Evolutionary Psychology in Understanding the Darwinian Roots of Consumption Phenomena," *Managerial and Decision Economics,* 27 (2-3), 189-201.

Saad, Gad (2007), *The Evolutionary Bases of Consumption*, Mahwah, NJ: Lawrence Erlbaum.

Saad, Gad (2011), *The Consuming Instinct: What Juicy Burgers, Ferraris, Pornography, and Gift Giving Reveal about Human Nature*. Amherst, NY: Prometheus Books.

Saad, Gad and Tripat Gill (2000), "Applications of Evolutionary Psychology in Marketing", *Psychology and Marketing,* 17 (12), 1005-1034.

Saad, Gad and Eric Stenstrom (2012), "Calories, Beauty, and Ovulation: The Effects of the Menstrual Cycle on Food and Appearance-Related Consumption," *Journal of Consumer Psychology*, 22, 102-113.

Saad, Gad and John G. Vongas (2009), "The Effect of Conspicuous Consumption on Men's Testosterone Levels," *Organizational Behavior and Human Decision Processes,* 110 (2), 80-92.

Silber, Märta (1994), "Menstrual Cycle and Work Schedule: Effects on Women's Sexuality", *Archives of Sexual Behavior*, 23 (4), 397- 404.

Silverstein, Michael J. and Kate Sayre (2009), "The Female Economy," *Harvard Business Review,* 87 (9), 46-53.

Stanislaw, Harold, and Frank J. Rice (1988). "Correlation Between Sexual Desire and Menstrual Cycle Characteristics", *Achieves of Sexual Behavior,* 17 (6), 499-508.

Swaminathan, Vanitha, Karen L. Page, and Zeynep Gurhan-Canli (2007), "Added 'My' Brand or 'Our' Brand: The Effects of Brand Relationship Dimensions and Self-Construal on Brand Evaluations," *Journal of Consumer Research*, 34 (2), 248–259.

Swaminathan, Vanitha, Karen M. Stilley and Rohini Ahluwalia (2009), "When Brand Personality Matters: The Moderating Role of Attachment Styles," *Journal of Consumer Research*, 35 (6), 985-1002.

Thiessen, Del and Barbara Gregg (1980), "Human Assortative Mating and Genetic Equilibrium: An Evolutionary Perspective", *Ethology and Sociobiology*, 1(2), 111-140.

Thornhill, Randy, Steven W. Gangestad, Robert Miller, Glenn Scheyd, Julie K. McCollough, and Melissa Franklin (2003),"Major Histocompatibility Complex Genes, Symmetry, and Body Scent Attractiveness in Men and Women," *Behavioral Ecology*, 14 (9), 668-678.

Tungate, Mark (2008), *Fashion Brands: Branding Style from Armani to Zara*, London, England: Kogan Page Limited.

Wilcox, Allen J., Dunson, David, Baird, Donna D. (2000), "The Timing of the 'Fertile Window' In the Menstrual Cycle: Day Specific Estimates from a Prospective Study", *British Medical Journal*, 321, 1259-1262.

Workman, Jane, E., and Cathryn M. Studak (2006), "Fashion Consumers and Fashion Problem Recognition Style", *International Journal of Consumer Studies,* 30 (1), 75-84.

Appendices

Appendix A: Exhibits

Exhibit 1: Sunglasses Model (RB 4126)

Exhibit 2: Feminine Ad Removed From Main Survey

Exhibit 3: Presence of Sunglasses Across All Ads

Sexy Condition **Exciting Condition** **Sophisticated Condition**

Sincere Condition

Appendix B: Pretest Two Survey

CONSENT TO PARTICIPATE IN "BRANDING SURVEY"

PURPOSE

This study is designed to gather young women's attitudes towards brands. A new sunglasses company, ***Solita,*** is being launched and the following ads need to be assessed to determine how best to position this brand. This project is being supervised by Dr. Gad Saad, Department of Marketing at the John Molson School of Business, Concordia University. This study will be used towards the completion of Alessandra Boezio's Master's thesis.

PROCEDURE

This questionnaire will take approximately 8-10 minutes to complete. Please follow the directions as indicated. Your responses are of the upmost importance to us.

CONDITIONS OF PARTICIPATION

- I understand that I am free to withdraw my consent and discontinue my participation at anytime without negative consequences.
  - If you have any questions or concerns regarding your rights as a participant, please contact Ms. Adela Reid, Research Ethics and Compliance Officer, Concordia University, at 848-2424 (ext. 7481).
- I understand that my participation in this study is **CONFIDENTIAL**, and that while the data from this study may be published, I cannot be identified by my answers since all results will be compiled and analyzed at the aggregate level.

I understand the purpose and terms of this study and agree to participate.

☐ **YES** ☐ **NO**

If you have any questions or concerns with regards to this questionnaire or this study, please feel free to contact:

Alessandra Boezio, Masters of Science in Administration Candidate
Email : a_boezio@jmsb.concordia.ca Tel: (514) 299-4705

****

Before you proceed to the next page:
Please indicate your sex, as this questionnaire is designed for **FEMALE** participants only

☐ **FEMALE** ☐ **MALE**

Solita is a new sunglasses brand and is planning its first advertising campaign. The objective of this study is to examine how consumers would perceive the brand *Solita* if they used different types of ads.

***Solita* Ad #1**

Please do not flip back to the previous page. Thank you.

***Solita* Ad #1**

If *Solita* chooses to run this ad (#1), to what extent do you agree that the following traits would **describe the *Solita* brand**?

Please circle your choice on a scale of 1 to 7:

	Strongly Disagree						Strongly Agree
1) Feminine	1	2	3	4	5	6	7
2) Sexy	1	2	3	4	5	6	7
3) Exciting	1	2	3	4	5	6	7
4) Sincere	1	2	3	4	5	6	7
5) Sophisticated	1	2	3	4	5	6	7

Please do not flip back to the previous page. Thank you.

***Solita* Ad #2**

Please do not flip back to the previous page. Thank you.

***Solita* Ad #2**

If *Solita* chooses to run this ad (#2), to what extent do you agree that the following traits would **describe the *Solita* brand**?

Please circle your choice on a scale of 1 to 7:

	Strongly Disagree						Strongly Agree
1) Feminine	1	2	3	4	5	6	7
2) Sexy	1	2	3	4	5	6	7
3) Exciting	1	2	3	4	5	6	7
4) Sincere	1	2	3	4	5	6	7
5) Sophisticated	1	2	3	4	5	6	7

Please do not flip back to the previous page. Thank you.

***Solita* Ad #3**

Please do not flip back to the previous page. Thank you.

Solita Ad #3

If *Solita* chooses to run this ad (#3), to what extent do you agree that the following traits would describe the *Solita* brand?

Please circle your choice on a scale of 1 to 7:

	Strongly Disagree						Strongly Agree
1) Feminine	1	2	3	4	5	6	7
2) Sexy	1	2	3	4	5	6	7
3) Exciting	1	2	3	4	5	6	7
4) Sincere	1	2	3	4	5	6	7
5) Sophisticated	1	2	3	4	5	6	7

Please do not flip back to the previous page. Thank you.

***Solita* Ad #4**

Please do not flip back to the previous page. Thank you.

***Solita* Ad #4**

If *Solita* chooses to run this ad (#4), to what extent do you agree that the following traits would **describe the *Solita* brand**?

Please circle your choice on a scale of 1 to 7:

	Strongly Disagree						Strongly Agree
1) Feminine	1	2	3	4	5	6	7
2) Sexy	1	2	3	4	5	6	7
3) Exciting	1	2	3	4	5	6	7
4) Sincere	1	2	3	4	5	6	7
5) Sophisticated	1	2	3	4	5	6	7

Please do not flip back to the previous page. Thank you.

***Solita* Ad #5**

Please do not flip back to the previous page. Thank you.

Solita Ad #5

If *Solita* chooses to run this ad (#5), to what extent do you agree that the following traits would **describe the *Solita* brand**?

Please circle your choice on a scale of 1 to 7:

	Strongly Disagree						Strongly Agree
1) Feminine	1	2	3	4	5	6	7
2) Sexy	1	2	3	4	5	6	7
3) Exciting	1	2	3	4	5	6	7
4) Sincere	1	2	3	4	5	6	7
5) Sophisticated	1	2	3	4	5	6	7

Thank you for your participation!

Please do not flip back to the previous page. Thank you.

Appendix C: Main Survey

CONSENT TO PARTICIPATE IN "BRANDING STUDY"

PURPOSE

This study is designed to gather young women's attitudes towards brands. A new sunglasses company, ***Solita***, is being launched and the following ads need to be assessed to determine how best to position this brand. Personal information will be required to complete this survey, however, rest assured that all responses are confidential and strictly for academic purposes. This project is being supervised by Dr. Gad Saad, Department of Marketing at the John Molson School of Business, Concordia University. This study will be used towards the completion of Alessandra Boezio's Master's thesis.

PROCEDURE

This study will take approximately 10 minutes to complete. Please follow the directions as indicated. Your responses are of the upmost importance to us. The design of this study requires a very brief 1-minute follow up question via email, in approximately two to three weeks following your initial participation in this study.

RISKS AND BENEFITS

Please keep in mind that by agreeing to accept the $3 compensation for your time, you are entering into a contract whereby you are expected to answer as truthfully and accurately as possible and participate in the follow up study mentioned above. Compensation will be awarded once the survey is completed and returned. You can stop your participation at any time without prejudice.

This study will include questions about your feelings, attitudes, preferences and purchase intentions towards a select brand. Furthermore, questions pertaining to medical history (use of hormonal contraceptives, menstrual cycle), and personal romantic relationships will also be asked.

CONDITIONS OF PARTICIPATION

- I understand that I am free to withdraw my consent and discontinue my participation at anytime without negative consequences.
  - If you have any questions or concerns regarding your rights as a participant, please contact Ms. Adela Reid, Research Ethics and Compliance Officer, Concordia University, at 848-2424 (ext. 7481).
- I understand that my participation in this study is **CONFIDENTIAL**, and that while the data from this study may be published, I cannot be identified by my answers since all results will be compiled and analyzed at the aggregate level.
- I understand that by filling out this questionnaire and accepting compensation for my time I am required to respond to the short question (sent via email) that will follow two to three weeks from now.

By providing my **signature** and **email address** below, I am stating that I understand and agree to the terms of this study. I freely consent to participating in **BOTH** portions of this study.

Name (Please Print): _____ Signature: _____
Email Address: _____

Should you have any questions or concerns about this study, please feel free to contact:
Alessandra Boezio, Master of Science in Administration Candidate
Email : a_boezio@jmsb.concordia.ca Tel: (514) 299-4705

PART I: ADVERTISEMENTS

1A) Ad Preferences

Solita is a new sunglasses brand that is planning its inaugural advertising campaign. The objective of this portion of the study is to determine which ad would be most effective for the upcoming product launch.

Solita Ad #1

Solita Ad #1

Please circle your choice on a scale of 1 to 7.

1. What is your overall evaluation of **this ad**?

Negative						Positive
1	2	3	4	5	6	7
Dislike						Like
1	2	3	4	5	6	7
Unfavorable						Favorable
1	2	3	4	5	6	7

2. If Solita chooses to run **this ad**, what would your overall evaluation of the **Solita brand** be?

Negative						Positive
1	2	3	4	5	6	7
Dislike						Like
1	2	3	4	5	6	7
Unfavorable						Favorable
1	2	3	4	5	6	7

3. If Solita chooses to run **this ad**, how likely are you to purchase the **Solita brand** in the near future?

Unlikely						Likely
1	2	3	4	5	6	7
Improbable						Probable
1	2	3	4	5	6	7

Solita Ad #2

Please do not flip back to the previous pages

Solita Ad #2

Please circle your choice on a scale of 1 to 7.

1. What is your overall evaluation of **this ad**?

Negative						Positive
1	2	3	4	5	6	7
Dislike						Like
1	2	3	4	5	6	7
Unfavorable						Favorable
1	2	3	4	5	6	7

2. If Solita chooses to run **this ad**, what would your overall evaluation of the **Solita brand** be?

Negative						Positive
1	2	3	4	5	6	7
Dislike						Like
1	2	3	4	5	6	7
Unfavorable						Favorable
1	2	3	4	5	6	7

3. If Solita chooses to run **this ad**, how likely are you to purchase the **Solita brand** in the near future?

Unlikely						Likely
1	2	3	4	5	6	7
Improbable						Probable
1	2	3	4	5	6	7

Solita Ad #3

Please do not flip back to the previous pages

Solita Ad #3

Please circle your choice on a scale of 1 to 7.

1. What is your overall evaluation of **this ad**?

Negative						Positive
1	2	3	4	5	6	7
Dislike						Like
1	2	3	4	5	6	7
Unfavorable						Favorable
1	2	3	4	5	6	7

2. If Solita chooses to run **this ad**, what would your overall evaluation of the **Solita brand** be?

Negative						Positive
1	2	3	4	5	6	7
Dislike						Like
1	2	3	4	5	6	7
Unfavorable						Favorable
1	2	3	4	5	6	7

3. If Solita chooses to run **this ad**, how likely are you to purchase the **Solita brand** in the near future?

Unlikely						Likely
1	2	3	4	5	6	7
Improbable						Probable
1	2	3	4	5	6	7

Solita Ad #4

Please do not flip back to the previous pages

Solita Ad #4

Please circle your choice on a scale of 1 to 7.

1. What is your overall evaluation of **this ad**?

Negative						Positive
1	2	3	4	5	6	7
Dislike						Like
1	2	3	4	5	6	7
Unfavorable						Favorable
1	2	3	4	5	6	7

2. If Solita chooses to run **this ad**, what would your overall evaluation of the **Solita brand** be?

Negative						Positive
1	2	3	4	5	6	7
Dislike						Like
1	2	3	4	5	6	7
Unfavorable						Favorable
1	2	3	4	5	6	7

3. If Solita chooses to run **this ad**, how likely are you to purchase the **Solita brand** in the near future?

Unlikely						Likely
1	2	3	4	5	6	7
Improbable						Probable
1	2	3	4	5	6	7

1B) Preference Ranking

Now that you have evaluated each of the ads separately, we would like you to compare them and rank them in terms of likeability (using **1** as most preferred and **4** as least preferred):

Rank: _____

Rank: _____

Rank: _____

Rank: _____

Please do not flip back to the previous pages

PART II: FOOD BRANDS

2A) Brand Preferences

We would like to know what you think about two well-known food-related brands, *McDonald's* and *Subway*. Please circle your choice on a scale of 1 to 7:

Brand #1: *McDonald's*

1. What is your overall evaluation of the ***McDonald's*** brand?

Negative						Positive
1	2	3	4	5	6	7
Dislike						Like
1	2	3	4	5	6	7
Unfavorable						Favorable
1	2	3	4	5	6	7

2. How likely are you to purchase the ***McDonald's*** brand in the near future?

Unlikely						Likely
1	2	3	4	5	6	7
Improbable						Probable
1	2	3	4	5	6	7

Brand #2: *Subway*

3. What is your overall evaluation of the ***Subway*** brand?

Negative						Positive
1	2	3	4	5	6	7
Dislike						Like
1	2	3	4	5	6	7
Unfavorable						Favorable
1	2	3	4	5	6	7

4. How likely are you to purchase the ***Subway*** brand in the near future?

Unlikely						Likely
1	2	3	4	5	6	7
Improbable						Probable
1	2	3	4	5	6	7

2B) Brand Perceptions

1. To what extent do you agree that the trait **healthy** describes the ***McDonald's*** brand?

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

2. To what extent do you agree that the trait **healthy** describes the ***Subway*** brand?

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

2C) Food Perceptions

For each of the following foods, please: **A) estimate the number of calories**, and **B) indicate how healthy** the plate of food is from 1 (not at all healthy) to 7 (very healthy).

1. Pad Thai

A) There are _____ calories in this food.

B) How healthy is this food (1 to 7)? ____

2. Burger and Fries

A) There are _____ calories in this food.

B) How healthy is this food (1 to 7)? ____

3. Chicken Salad

A) There are _____ calories in this food.

B) How healthy is this food (1 to 7)? ____

4. Fish and Potatoes

A) There are _____ calories in this food.

B) How healthy is this food (1 to 7)? ____

Please do not flip back to the previous pages

PART III: BRANDS IN GENERAL

Please indicate your level of agreement with the following statements:

1. I use brands to reflect on who I am.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

2. I use brands to communicate who I am to other people.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

3. I use brands to feel more positive about myself.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

4. I use brands to make a better impression on other people.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

5. I enjoy sampling different brands of commonplace products for the sake of comparison.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

6. I would rather stick with a brand I usually buy than try something I am not very sure of.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

7. If I like a brand, I rarely switch from it just to try something different.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

Please do not flip back to the previous pages

8. I get bored with buying the same brands even if they are good.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

9. A lot of the time I feel the urge to buy something really different from the brands I usually buy.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

10. If I did a lot of flying, I would probably like to try all the different airlines, instead of flying just one most of the time.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

11. I enjoy exploring several different alternatives or brands while shopping.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

PART IV: PERSONAL INFORMATION

3. Age: _____

4. Area of study: _____

5. Ethnic group (please circle your answer): Caucasian Asian Middle-Eastern Black Latin
   Other: _____
   Mixed: _____

6. Are you a full time student? Please circle your answer:

Yes	No

7. How hungry do you feel right now? Please circle your answer:

Not at All Hungry						Very Hungry
1	2	3	4	5	6	7

Please do not flip back to the previous pages

8. How much do you feel like eating food right now?

Not at All						Very Much
1	2	3	4	5	6	7

9. How full does your stomach feel right now?

Not at All Full						Very Full
1	2	3	4	5	6	7

10. Are you in a committed romantic relationship? Please circle your answer:

Yes	No

If YES: For how many months? For _____ months.

11. How secure do you feel in your relationship?

Not at All Secure						Very Secure
1	2	3	4	5	6	7

12. How committed are you to your relationship?

Not at All Committed						Very Committed
1	2	3	4	5	6	7

13. In the calendar below **please circle**, to the best of your knowledge, the **first** day of your most **recent** menstrual cycle (period):

DECEMBER 2010

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

JANUARY 2011

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

FEBRUARY 2011

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					

MARCH 2011

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

14. In the last **three** months have you taken hormonal contraceptives (this might include *The Birth Control Pill*, *contraceptive patch*, *contraceptive injections and NuvaRing*) or emergency contraceptives (this might include *Morning After Pill or Plan B*)? Please circle your answer:

Yes	No

Please do not flip back to the previous pages

15. With how many different partners have you had sex (sexual intercourse) within the past year?

    _____

16. How many different partners do you foresee yourself having sex with during the next five years? (Please give a *specific, realistic* estimate)

    _____

17. With how many different partners have you had sex on *one and only one* occasion?

    _____

18. How often do you fantasize about having sex with someone other than your current dating partner? (Circle the option that best represents your answer.)

Never	Once every 2 or 3 months	Once a month	Once every 2 weeks	Once a week	A few times each week	Nearly every day	At least once a day
1	2	3	4	5	6	7	8

19. Sex without love is okay.

Strongly Disagree								Strongly Agree
1	2	3	4	5	6	7	8	9

20. I can imagine myself being comfortable and enjoying "casual" sex with different partners.

Strongly Disagree								Strongly Agree
1	2	3	4	5	6	7	8	9

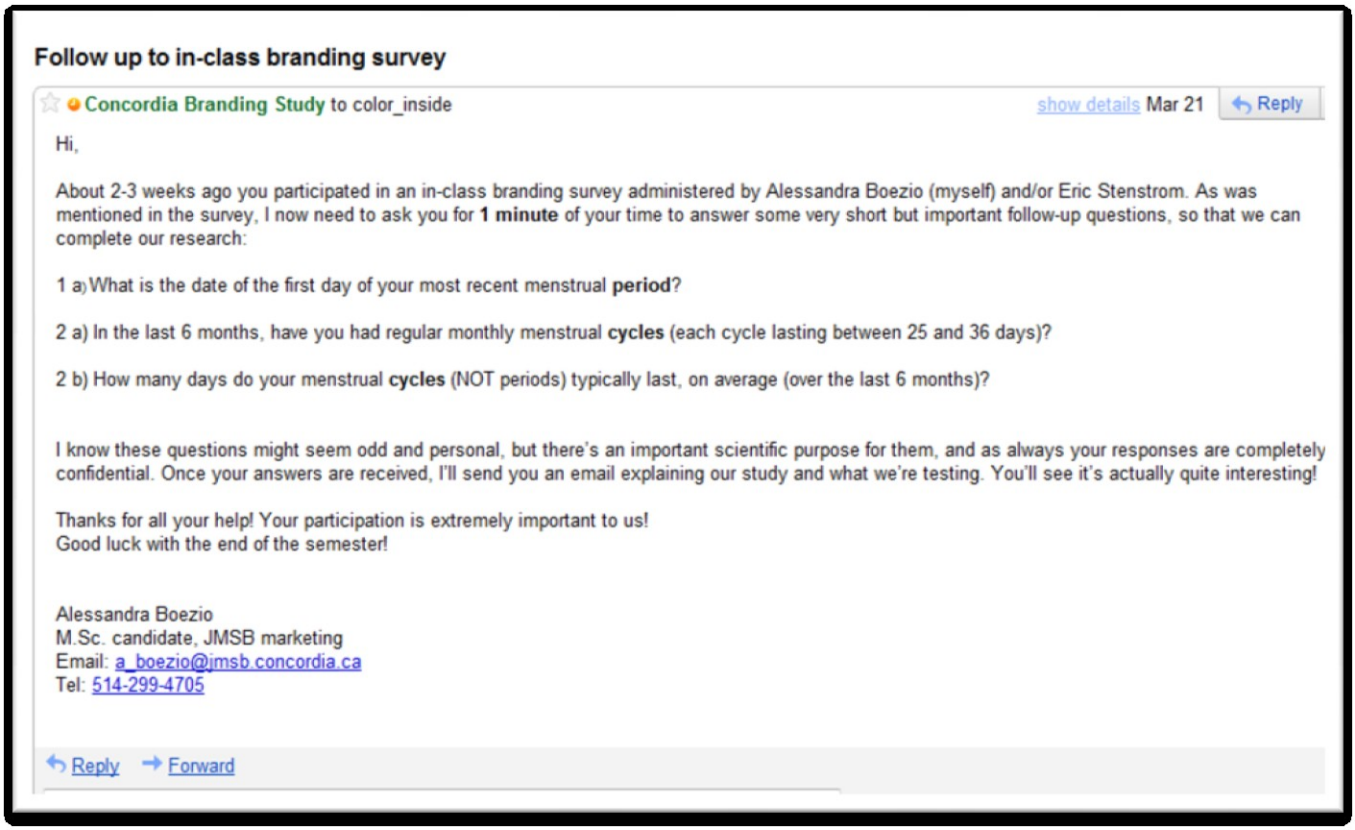
21. I would have to be closely attached to someone (both emotionally and psychologically) before I could feel comfortable and fully enjoy having sex with him or her.

Strongly Disagree								Strongly Agree
1	2	3	4	5	6	7	8	9

Thank you for participating in this study! You will be contacted via email, in **two to three** weeks, with a short follow-up question.

Please do not flip back to the previous pages

Appendix D: Screen Shot of Follow-Up Email



Follow up to in-class branding survey

Concordia Branding Study to color_inside show details Mar 21 Reply

Hi,

About 2-3 weeks ago you participated in an in-class branding survey administered by Alessandra Boezio (myself) and/or Eric Stenstrom. As was mentioned in the survey, I now need to ask you for **1 minute** of your time to answer some very short but important follow-up questions, so that we can complete our research:

1 a) What is the date of the first day of your most recent menstrual **period**?

2 a) In the last 6 months, have you had regular monthly menstrual **cycles** (each cycle lasting between 25 and 36 days)?

2 b) How many days do your menstrual **cycles** (NOT periods) typically last, on average (over the last 6 months)?

I know these questions might seem odd and personal, but there's an important scientific purpose for them, and as always your responses are completely confidential. Once your answers are received, I'll send you an email explaining our study and what we're testing. You'll see it's actually quite interesting!

Thanks for all your help! Your participation is extremely important to us!
Good luck with the end of the semester!

Alessandra Boezio
M.Sc. candidate, JMSB marketing
Email: a_boezio@jmsb.concordia.ca
Tel: 514-299-4705

Reply Forward