



Menstrual cycle effects on prosocial orientation, gift giving, and charitable giving



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ABSTRACT

Recent research has found that the menstrual cycle affects product preferences. However, might the menstrual cycle also impact whom women prefer to spend their money on? Drawing from evolutionary theory, we predict and find that women are more prosocial during the luteal phase than during the follicular phase. Across three studies, we show that women allocate more money towards gifts for loved ones during the luteal phase, and that this prosociality extends to anonymous others through charitable donations and via an established social orientation task. Furthermore, we find that the menstrual cycle effect on prosociality is mediated by perceived dependence on others. Taken together, our findings suggest that the luteal phase not only prepares women's bodies for a potential pregnancy, but also prepares them psychologically by motivating them to depend on and foster social alliances that historically would have been beneficial in the event of a pregnancy.

1. Introduction

Imagine a woman walking through a bookstore. She browses around and comes across a new release by an author that she really likes. After deciding to purchase it, she then sees another book that her best friend has been talking about wanting to read for some time. Due to budgetary constraints, she is faced with the decision of either purchasing the book for herself or the book for her friend. Although many factors likely contribute to this decision, could biological factors have an influence? Is it possible that a woman's decision to spend money on others is impacted by her menstrual cycle?

In the current work, we propose that women will be more prosocial during the luteal phase of the menstrual cycle because they seek to foster relationships. Across three studies, we demonstrate that women are more prosocial during the luteal phase of the menstrual cycle. Specifically, we find that women are more inclined to give gifts to loved ones and donate money and time to charity during the luteal phase. Moreover, we show that perceived dependence on others mediates the effect of the menstrual cycle on prosociality. These findings contribute to the consumer behavior literature by showing that the menstrual cycle not only affects what women buy (Durante & Arsena, 2015; Faraji-Rad, Moieni-Jazani, & Warlop, 2013; Saad & Stenstrom, 2012), but also for whom they do so.

2. Conceptual background

2.1. The menstrual cycle

The menstrual cycle spans approximately 28 days. Ovulation occurs mid-way through the cycle and marks the end of the follicular phase and the beginning of the luteal phase (Nelson, 2005). According to an evolutionary perspective, women have evolved psychological mechanisms that promote adaptive behaviors, which respond to the specific challenges associated with each phase of the menstrual cycle (Fessler, 2003). In particular, women are motivated to prepare for a potential pregnancy during the luteal phase (Conway et al., 2007; Fleischman & Fessler, 2011; Jones et al., 2005; Jones et al., 2005; Maner & Miller, 2014), whereas they favor reproductive goals during the late follicular phase when conception is possible (Fessler, 2003; Gangestad & Thornhill, 2008). Over the past decade, a growing body of research has emerged that supports this theory of adaptive menstrual cycle shifts in motives. For example, women's consumption preferences and behaviors that promote reproductive goals are augmented during the late follicular phase of the menstrual cycle (Durante & Griskevicius, 2016; Saad, 2013). Conception can theoretically occur during a 6-day fertile window of the follicular phase that typically spans between days 10 and 15 of a 28-day cycle (Wilcox, Dunson, Weinberg, Trussell, & Baird, 2001). During this fertile window, consumers seek high-status products

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(Durante, Griskevicius, Cantu, & Simpson, 2014), engage in greater beautification behaviors (Röder, Brewer, & Fink, 2009; Saad & Stenstrom, 2012), and prefer appearance-enhancing products (Durante, Li, & Haselton, 2008; Durante, Griskevicius, Hill, Perilloux, & Li, 2011; Haselton, Mortezaie, Pillsworth, Bleske-Rechek, & Frederick, 2007; Saad & Stenstrom, 2012).

During the luteal phase, the body prepares for a potential pregnancy, regardless of whether conception actually occurs. This process entails physiological changes such as the thickening of the uterine lining in order to facilitate the growth of a fertilized egg and the marked increase in levels of progesterone, a hormone that plays a central role in pregnancy (Nelson, 2005). The luteal phase also promotes certain preferences and behaviors that foster women's preparation for a potential pregnancy. For example, women intake more calories (Buffenstein, Poppitt, McDevitt, & Prentice, 1995; Saad & Stenstrom, 2012) and exhibit stronger disease-avoidance preferences during the luteal phase (Fleischman & Fessler, 2011; Jones et al., 2005; Jones et al., 2005). Furthermore, throughout evolutionary history, pregnancy has impeded women's ability to procure resources and escape threats, thereby increasing their dependence on allies (Taylor et al., 2000). If the luteal phase motivates behaviors that serve to overcome the challenges that were historically faced during pregnancy, women may feel particularly dependent upon, and motivated to nurture, social alliances at this time of the menstrual cycle (Jones et al., 2005; Maner & Miller, 2014). In line with this theorizing, women in their luteal phase are more attuned to social stimuli (Maner & Miller, 2014) and are more strongly committed to their romantic partner (Jones et al., 2005). One way for women in the luteal phase to nurture social alliances is by engaging in prosocial behavior.

2.2. Prosocial behavior

Prosocial behavior entails committing acts that benefit others or are regarded as being beneficial to others (Carlo, PytlíkZillig, Roesch, & Dienstbier, 2009). Researchers have explored various factors that influence whether someone will engage in prosocial behavior (Abrahams & Bell, 1994; Kappes, Sharma, & Oettingen, 2013; Ye, Teng, Yu, & Wang, 2015). For example, prosocial proclivities are influenced by affective states (Isen, 2001), empathy (Verhaert & Van den Poel, 2011), nostalgia (Merchant, Ford, & Rose, 2011), power (Rucker, Dubois, & Galinsky, 2011), a charitable organization's brand image (Michel & Rieunier, 2012) and storytelling (Merchant, Ford, & Sargeant, 2010), as well as stable factors such as biological sex and culture (Nelson, Brunel, Supphellen, & Manchanda, 2006). Prosocial behavior has long perplexed scholars because it appears irrational to merely give one's scarce resources away for someone else's benefit (Etzioni, 1988). However, despite the immediate costs associated with prosocial behavior, these acts can indeed be beneficial to the giver if the receiver later reciprocates (Axelrod, 2006; Saad, 2007, 2011; Trivers, 1971). Furthermore, research suggests that people are generally motivated to reciprocate an act of generosity (Bartlett & DeSteno, 2006; Cialdini, 1993). It is in this sense that committing a prosocial act towards a specific individual may be an effective means of securing their future support.

In addition to prosocial acts directed towards a specific recipient, consumers may also engage in more generalized prosocial behavior. For example, charitable giving in the form of financial donations entails allocating one's resources to any number of anonymous recipients. This form of prosocial behavior can benefit the giver due to the inferences others make about them. For example, generous acts such as donating to charity can signal to others that one is kind (Miller, 2007), trustworthy (Fehrler & Przepiorka, 2013), and a desirable romantic partner (Griskevicius et al., 2007). Furthermore, correlational research suggests a positive relationship between prosocial behavior and social acceptance (Parkhurst & Asher, 1992; Schonert-Reichl, 1999). Thus, even when norms of reciprocity are irrelevant, engaging in prosocial

behavior may be beneficial because it conveys a positive image to others, thereby enhancing one's reputation within their social circle (Barclay, 2010, 2011; Saad, 2007, 2011). Therefore, prosocial behavior may offer an effective means of garnering social support, both directly via reciprocity from helping those within one's social circle and indirectly via reputational benefits from helping those outside of one's social circle.

Given the substantial resource acquisition and self-protection challenges historically associated with pregnancy, this would have increased women's dependence on allies (Taylor et al., 2000). Stronger social alliances were likely to be beneficial for a woman who became pregnant, making it advantageous to rely on and nurture relationships more so during the luteal phase (Jones et al., 2005; Maner & Miller, 2014). Since prosocial behavior provides a means of building and maintaining relationships (Griskevicius et al., 2007; Miller, 2007; Saad, 2007, 2011), we hypothesize that women will make more prosocial choices during the luteal phase compared to the follicular phase. Furthermore, we propose that the effects of the menstrual cycle on prosocial behavior will be mediated by feelings of dependence on others. If the luteal phase motivates women to prepare for a potential pregnancy (Maner & Miller, 2014), then an increased dependence on others during this phase would have likely led to stronger alliances, which would have been beneficial in the event of a pregnancy. Depending on other people fundamentally entails viewing a relationship with them as being beneficial and perceiving them as possessing utility. As a result, people spend more on others when they feel more dependent (Rucker et al., 2011). Thus, we predict that women will feel more dependent on others during the luteal phase than during the follicular phase, and that this heightened dependence will lead to greater prosociality.

2.3. Overview of the present research

We conducted three studies to investigate how prosociality varies across the menstrual cycle. In Study 1, using a longitudinal study design, we demonstrated that women allocate more money towards gifts for loved ones during the luteal phase compared to the follicular phase. In Study 2, we showed that the luteal phase effect on prosociality extends to consumption behavior benefiting anonymous others. Specifically, we found that donation intentions increased during the luteal phase. Finally, in Study 3, we adopted an established prosocial orientation task and showed that the effect of the menstrual cycle on prosocial choices is mediated by perceived dependence on others.

3. Study 1

Study 1 served as an initial test of our prediction that women will be more prosocial during the luteal phase of the menstrual cycle. In particular, we tested how the menstrual cycle affects gift giving. There is a substantial body of research exploring the social functions of gift giving (Belk & Coon, 1993; Caplow, 1982; Saad, 2007; Saad & Gill, 2003). For example, gift giving promotes cooperation and trust (Carmichael & MacLeod, 1997), and signals to the recipient that they have a close relationship (Ward & Broniarczyk, 2016). Thus, gift giving often plays an important role in building and maintaining relationships (Saad, 2007, 2011). If women in the luteal phase are ultimately motivated to cultivate social ties as a means of preparing for the potential of pregnancy (Jones et al., 2005; Maner & Miller, 2014), then they should be more inclined to spend their money on gifts for others as opposed to spending on themselves. We adopted a longitudinal design to test this prediction.

3.1. Method

Thirty five normally cycling female undergraduate students ($M_{\text{age}} = 22.54$, $SD_{\text{age}} = 2.31$) were asked to complete an online survey every evening for a period of 35 days. The daily survey contained an

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