MENSTRUATION'S EFFECTS ON WORK OUTCOMES AND BEHAVIOURS: A RESOURCE PERSPECTIVE

by Mikaila Ortynsky

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Supervised by: Dr. Alyson Byrne

Faculty of Business Administration

Memorial University of Newfoundland

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Abstract

How menstruation effects organizational factors is not well understood. Given that menstruation presents a variety of physical, emotional, and behavioural symptoms, it is important to understand how this bodily process influences worker behaviours. The purpose of this study is to examine how menstruation affects women's daily work experiences, predicting that, via the Conservation of Resources theory, women would be more likely to be depleted when menstruating, thus increasing their work withdrawal and decreasing their levels of job satisfaction. I predict that these relationships would be mediated by self-control and affect. Using experience sampling methodology with 96 participants over 30 consecutive days (daily time-points= 2650), results indicate that when women experience menstrual bleeding, they experience increased work withdrawal via decreased self-control and decreased job satisfaction via negative affect. The findings of this research speak to the influence of a monthly bodily process nearly half the workforce faces each month. Practical and theoretical implications are discussed.

Keywords: menstruation, menstrual cycle, women's health, self-control, affect, job satisfaction, work withdrawal, COR theory

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> "The era of menstrual taboos is over. The only curse here is the ability to convince half the population that the very biological machinery that perpetuates the species, that gives everything that we have, is somehow dirty or toxic… And the way we break that curse? It's knowledge." (Gunter, 2019)

A woman[1] experiences menstruation (also referred to as menstrual bleeding or menstrual period) for approximately 40 years of her life, mostly during the time in her life that overlaps with her career (Shifen et al., 2014). Due to fluctuating levels of hormones that govern the month-long menstrual cycle (estrogen and progesterone; Owen, 1975), women experience a variety of behavioural (e.g., fatigue), emotional (e.g., affect), and physical (e.g., pain) symptoms that can greatly impact their experience at work (Daugherty, 1998). Recent management literature suggests that the incongruence between ideal worker norms present in many workplaces and the nature of menstruation may hinder women's career progression (Grandey et al., 2020). Based on the ideal worker paradigms, entry-level white-collar workers and middle managers are expected to be fully devoted to their work with no external commitment (Bailyn, 2006; Kelly et al., 2010). Engaging in such behaviours signal dedication and commitment to one's work (Blair-Loy, 2009).

The ideal worker expectation does not take into account the fundamentally physiological nature of menstruation. Each month, women go through natural and inevitable biological process in which the body prepares itself for potential childbearing. Yet, workplaces still view menstruation as a 'taboo' topic (Grandey et al., 2020). The inattention to physiological sex

[1] Throughout the thesis, I will interchange the word "female" and "woman." These terms are used in a very limited sense to refer to individuals that experience a regular, natural menstrual cycle (Schmalenberger et al., 2021). I recognize those who experience a menstrual cycle are much larger than the female and woman groups. The focus of this thesis is menstruating individuals; hence, these are the individuals pertinent to this research agenda.

differences between men and women have resulted in barriers for women as shown in research in many disciplines. For example, in kinesiology literature it was widely assumed until the 1980s that the physiological responses to exercise did not differ between men and women (Sims & Heather, 2018). Consequently, exercise and training recommendations often benefited male physiology and performance, while women received suboptimal training recommendations for their physiology (Sims & Heather, 2018). In occupational requirements for physical jobs, we have also seen a similar situation. For example, in a fitness test aimed to set physical standards for both male and female firefighters in Canada, a court found the standards to be discriminatory against women as they did not have the physiological aerobic capacity to meet such standards (CBC News, 2018).

In the recent decades, management and work psychology literature has expanded its focus to investigate how physiological non-work variables (i.e., physical bodies at work) impact workplace outcomes (for a review see Ganster et al., 2018). For instance, the recent drive to understand how sleep impacts work behaviours has found that sleepiness and poor sleep quality is an antecedent to abusive supervisory behaviours and other negative outcomes (Barnes et al., 2015). Like sleep, menstruation is inherently a physiological phenomenon, and one that cannot be separated from women's physical work experiences (Ashforth et al., 2000; Motro et al., 2019). Thus, when studying how menstruation influences work outcomes, it is useful to draw from biology to help us examine the connection between women's physiological bodies and their work behaviours. The approach taken in this thesis is adopted from other influential articles in management which use a physiological framework to explain the relationship between workplace outcomes and physiological processes (e.g., Heaphy & Dutton, 2008; Mullins et al.,

2014). In addition, this thesis responds to calls by scholars to research the blind spot of menstrual-related issues that may impede women's success (Traylor et al., 2020).

The influence of menstruation on work behaviours is all but ignored in management research. Based on my extensive literature review, the current, and only, menstruation study in the field (Motro et a., 2019) investigated how menstruation effects women's daily well-being and helping behaviours (e.g., organizational citizenship behaviour). Their findings indicated that on days when women felt pain related to menstruation, they experienced increased feelings of depletion, thus decreasing their helping behaviours at work (Motro et al., 2019). While these findings contribute to our understanding how unique, sex-specific physiological factors affect work, it overlooks the salience of hormonal changes and symptoms of menstruation. Motro and colleagues (2019) rely on pain as a mechanism to explain depletion, which does not take into account the behavioural or emotional changes associated with menstruation. Menstrual symptoms encompass much more than pain. As explained in future sections, some women experience fatigue, irritability, breast swelling, depressed mood, concentration loss, backache, abdominal ache, or other symptoms (Shimamoto et al., 2021). I focus on investigating menstruation, and its full host of symptoms, as a source of resource depletion that explain changes in certain work behaviours via different mechanisms, namely self-control and affect.

The primary purpose of this thesis is to expand upon research by Grandey and colleagues' (2020) and Lawrence et al. (in press) that emphasize the importance of understanding our physical bodies at work. My work specifically examines a notably taboo topic of women's physical bodies, menstruation. In this thesis, I will briefly overview the existing management research of how employees' physical bodies influence the workplace. I then visit the societal and workplace beliefs of women's physical bodies by briefly overviewing how stigma has influenced

how we look at women's bodies at work. From there, I focus particularly on the perceptions around women's menstruating bodies at work and outline the biological mechanisms that make menstruation unique to other physiological processes and why they are likely to have an impact on work behaviours. To explain how these biological mechanisms influence work behaviours, I use the Conservation of Resources (COR) theory to suggest that women are in a unique state of resource spiral while menstruating. Then, I develop a series of hypotheses that suggest when women are menstruating, this depletion effect will impact work behaviors such as work withdrawal and job satisfaction via self-control and affect respectively.

Overall, I aim to primarily overview how the individual physiology behind menstruation depletes internal resources to understand the effects of menstruation more fully for working women who menstruate and contribute to the literature on physical bodies at work. In so doing, my hope is that the findings of this research help to further understand a taboo topic and enable organizations to recognize that physiological processes for all workers have impacts on work behaviors and that menstruation is but just one of those physical processes. In turn, organizations can practically attend to ways in which to better support employees' bodies at work to restore their resources and enable workers to best take care of their physical needs while also attending to their work needs.

Literature Review

Bodies at Work

Organizational research on the body and bodily needs is rare, but slowly increasing (for review see Lawrence et al., in press). The gap in understanding how the human body interacts with the workplace may be due to the traditional view of a white-collared worker of being "bodiless" and one who "occupies the abstract, gender-neutral job, has no sexuality, no

emotions, and does not procreate" (Acker, 1990, p. 151). As recent management research has demonstrated, human bodies can enhance and dimmish physical and mental well-being at work (Lawrence et al., in press). While organizational researchers have become enchanted with the possibilities of the future of work with technologies like artificial intelligence, machine learning, and neural networks (Acemoglu & Restrepo, 2018), it's important to note that human bodies influence and touch every aspect of work. By workers or organizations ignoring the needs of their body, or researchers overlooking how the bodies incorporate or influence organizations, we restrict our understanding of the necessary tools needed for workers and organizations to thrive (Lawrence et al., in press).

The human body is complex and not widely understood by most, especially in organizational contexts. Lawrence and colleagues' (in press) conceptualized the body at work into three lenses: materiality, meaning (how human's make sense of their body through relationships), and functionality (what the body is able to do). Throughout this thesis, I will primarily be focusing on the materiality lens, which views the body as a material object. This is not to equate the human body to objects like a stapler or desk chair. What conceptualizing the body as a material object does is recognize and highlight the body's function, separate from mind, and focuses on its physiology (Dale, 2005; Lawrence et al., in press).

Management researchers lack of familiarity with physiology is still apparent, despite calls for greater integration of physiological research (for review see Heaphy & Dutton, 2008). For organizations to truly provide an environment for their workers to excel, researchers must bring the body back into the equation. Much of organizational research investigating physiology and work has put work at its forefront, such that the primary objective of studies has been to understand what effect work has on the body rather than the influence of the body on work. The

significance of the organization on the human body at work is not to be undermined. Scholars have found that a harmful work environments like stressful conditions (Akinola et al., 2019) and work-family conflict (Frone et al., 1997) are likely to have negative consequences on individuals' bodies ranging from cardiovascular problems to depression. The result of workers' labour often results in bodily strains and injuries (Reville et al., 2001) and the stress of work has been associated with greater risk of type 2 diabetes and heart disease (Kivmäki & Kawachi, 2015). Conversely, work has the capacity to greatly increase the well-being of workers. Positive social experiences at work, like social support, are associated with lower blood pressure and heart rate along with stronger immune responses (Heaphy & Dutton, 2008). Organizational research has primarily studied the body as a target, rather than a source, of organizational life. Organizations do not solely shape workers' bodies, though they have great capacity to do so (e.g., Michel, 2011). Workers have bodies and inevitable bodily processes like aging, immunity, sleep, and for women, menstruation, are experienced long before they join organizations. Workers must bring awareness to their bodies and take care of their needs for their own longevity.

As body research in the organizational field is rare, investigating the body as a source of organizational influences is even more scarce. Only recently have researchers began to study how physiological processes can influence workers and organizations. Primarily, researchers have found that these processes effect work outcomes via human energy or self-regulatory resources (Christian et al., 2015; Quinn et al., 2012). For instance, a lack of sleep impairs cognition, which subsequently has a negative effect on working memory, attention, and information processing necessary for work tasks and performance (Mullins et al., 2014). Similarly, chronic pain has been shown to lead to internal resource depletion, thus contributing to

increased work withdrawal behaviours and decreased work engagement (Christian et al., 2015). Via a resource perspective, both studies suggest bodily processes as source of resource depletion necessary to engage in work tasks, contrary to the bulk of organizational literature which suggests the body to be a target of work outcomes. This suggests that the body as a source has been overlooked in the field of management research. However, the human body touches every aspect of work and workers, so it is imperative for organizational research to consider physical bodily influences at work. This thesis intends to fill this research gap by focusing on a high frequency physiological process that effects nearly half the workforce—menstruation. Prior to overviewing the biological mechanisms that influence menstruation, I will briefly overview how other bodily processes specific to women have been studied in the management field.

Women's Bodies and Work

Female biological processes like pregnancy, breastfeeding, menopause, and menstruation have been widely stigmatized in the media, and especially in the workplace (Chrisler, 2011; Gabriel et al., 2020; Grandey et al., 2020; Little et al., 2015; Sang et al., 2021). Goffman (1963) defines stigma as an "attribute that is deeply discrediting," which reduces someone "from a while and usual person to a tainted, discounted one" (p. 3). He proposes there are three categories of stigma: (1) abominations of the body (e.g., physical deformities); (2) blemishes on individual character (e.g., addictions, mental illness); and (3) tribal stigma (e.g., race gender, religion; Goffman, 1963). In workplace settings, workers are stigmatized for a variety of reasons, but particularly when a perceiver views the target as threatening the social norms of the workplace (Van Laar et al., 2019) or is aligned with one of the three stigma categories (Goffman, 1963).

Often, engaging, recognizing, or attending to these female processes signal a non-commitment to work and is harmful to women's professional images. For instance, pregnant

women are often subject to the perception from superiors and co-workers that they are stepping away from work (Fox et al., 2015; Paustian-Underdah et al., 2019). This perception was found to have harmful effects on these women's work performance. As Halpert and colleagues (1993) found, pregnant women received lower job performance appraisals from their superiors. Gabriel et al. (2020) also found similar outcomes for women who breastfeed at work. In their study, participants indicated that they felt stigmatized by their co-workers, specifically feeling that their professional image was damaged, and they were viewed with disgust by their co-workers (Gabriel et al., 2020). Women face negative stereotypes and stigma throughout their career when dealing with their bodily processes, even until menopause, which occurs around age 51 (Shuster et al., 2010). Menopausal women are often viewed as frail and passive or warm but incompetent (Bariola et al., 2017; Chrisler et al., 2016). Studies indicate that menopausal women were fearful of co-workers forming negative, age-related perceptions of them if they disclose they are experiencing menopause (Hardy et al., 2018). In contrast to breastfeeding and pregnancy, which is likely to happen at the beginning or middle of a woman's career, menopause occurs towards the end (Grandey et al., 2020). Menopausal women are more likely to be in leadership roles as this time correlates with the mid-late career phase (Grandey et al., 2020). As a result, the stigma and negative perceptions menopausal women encounter also have consequential effects on their career as stereotype of being warm but not competent is incongruent with the leader prototype (Eagly & Karau, 2002).

Moving beyond the societal and stigmatized aspect of these female processes, it is important to note these bodily processes are often inevitable. Menopause, pregnancy, and breastfeeding have yet to be research from a physiological perspective. Thus, we know little about what influence these uniquely female processes have on work. However, as research in this

area is burgeoning, organizational researchers have begun to theorize what impact symptoms associated with these processes would have in an organizational context. For instance, women in menopause experience a range of symptoms from sleep disturbances to anxiety to hot flashes (Brewis et al., 2017). Like other bodily processes, Atkinson and colleagues (2021) theorize menopausal symptoms have a bi-directional relationship with work, such that menopause symptoms can create problems at work (e.g., difficulty paying attention) and work can exacerbate symptoms. A United Kingdom National Statistics (ONS) survey reported 14 million working days were lost due to physiological and psychological symptoms associated with menopause and one in 10 women reported passing on an opportunity for a more demanding role because of their menopause symptoms (ONS, 2020). Pregnant women also experience a wide array of their human functioning. Especially late in the pregnancy, women report physical discomforts, depressive symptoms, and greater emotional variability (Kamysheva et al., 2010; Spiteri & Xuereb, 2012). Pregnant women are thought to be more susceptible to resource loss due to the bodily changes and energy expended during pregnancy (Grandey et al., 2020). Though it may be reasonable to believe when women are going through intense bodily changes it depletes their personal resources, there is generally a lack empirical evidence to provide support for this within an organizational context. In the next sections, I will briefly overview how menstruation is perceived, generally and in the workplace, and then explain the biological mechanisms of menstruation and its effects on women's bodies.

Overview of Menstruation

Menstruation Stigma

Previous studies suggest that menstruation fits into all three categories of stigma. Johnston-Robledo and Chrisler (2013), who initially conceptualized menstruation stigma, argue

that, like other bodily fluids, menstrual bleeding can be considered a bodily abomination. Further, a physical menstrual blood stain may be viewed as a blemish of oneself and taints a woman's femininity. Finally, with menstrual bleeding being distinctly female, it indicates a tribal identity (Johnston-Robledo & Chrisler, 2013). The 'leakiness' related to menstruation also posits a threat to a well-kept environment and social order in the workplace (Jack et al., 2019).

Menstruation stigma has yet to be studied in the workplace, thus we do not know what workplace outcomes, if any, employees may face, however there is evidence that, within organizations, females who are pregnant or breastfeeding are stigmatized, thus it is likely that for women who are, or who are perceived, to be menstruating, there too exists a menstruation stigma at work.

Though experiencing menstruation is not abnormal, it is often viewed with disgust (Bramwell, 2001; Johnson-Robledo & Chrisler, 2013). In Sang and colleagues' (2021) qualitative survey study of 627 women in higher education, participants indicated four main themes of occupational difficulties they face when managing menstruation at work: managing "leaky" bodies, access to facilities, managing stigma, and managing workload (p. 7). Participants reported they were concerned about menstrual blood leaking or smelling and others noticing. These women reported having to focus on concealing their 'leaky' bodies than their work tasks (Sang et al., 2021). Women also indicated they were fearful of being perceived as weak if they discussed their menstrual issues at work, so, participants attended work despite experiencing menstrual symptoms that prevented them from fully carrying out their work duties (Sang et al., 2021, p. 9). As such, while this is a single study that has looked at the ways in which women manage menstruation at work, it suggests that women go to great lengths to hide their experience for fear that others might find out or perceive them differently at work. What this study does not

account for, however, is how women physiologically experience menstruation while working and the effects it might have on their work behaviours. I explore that in my next section, which is central to my theory development.

Biological Mechanisms of Menstruation

Describing menstruation and the menstrual cycle in a way that applies to all women is difficult. While approximately 26 percent of the global population menstruates each month (UNICEF, 2018), some individuals do not. There are various reasons why a woman may or may not menstruate, including pregnancy, post-menopause, and amenorrhea (absence of a period; Practice Committee of the American Society for Reproductive Medicine, 2006). Women may experience dysmenorrhea (period pain) in varying aspects of their menstrual cycle while others have no symptoms at all (Riley et al., 1999; Armour et al., 2019). Overall, each woman experiences her menstrual cycle differently. Current menstruation research is not encompassing of varying experiences and conditions; thus, I will summarize the current research and most common experiences for women. Discussion of special conditions or abnormal period experiences is beyond the scope of this thesis as there is a lack of understanding with respect to normal menstruation in organizational contexts, and as such, it is important to first establish research on the general experience of menstruation which affect most women before an investigation into abnormal period experiences can occur.

A female experiences her first menstrual cycle (also known as menarche), on average, at age 12.25 (Biro et al., 2018). Menstruation is regulated by two groups of sex hormones: estrogen and progesterone (Farage et al., 2009), which levels fluctuate throughout a woman's cycle. The progesterone hormones are primarily responsible for preparing the uterus for potential childbearing (Takei et al., 2015); whereas, the estrogen hormones are responsible for the general

development of the female reproductive organs (Wiele et al., 1970). While these two groups of hormones govern the menstrual cycle, its entirety is a result of a carefully orchestrated sequence between the endocrine and reproductive systems, which highlights the full-body, multi-system effect the menstruation has on an individual (Silberstein & Merriam, 2000).

The levels of each hormone have different effects on a woman's physical, emotional, and behavioural symptoms. To explain this, I briefly outline the levels of each hormone group at each menstrual phase (menstruation, follicular, ovulation, and luteal) and associated effect on the body. Menstruation is triggered by the rapid decline of estrogen and progesterone (Schamlenberger et al., 2021) and is terminated by the end of menstrual bleeding. Progesterone stays relatively low during the duration of the menstrual and follicular phase, while estrogen begins to rise in levels (Knudtson & McLaughlin, 2020). During the follicular phase, the ovaries begin creating follicles, which have the potential to release an egg for fertilization (Schamlenberger et al., 2021). The release of the egg from the follicle is called ovulation. Immediately before ovulation, estrogen spikes then subsequently falls again when the egg is released. The menstrual cycle then enters the luteal phase, which is the time after ovulation until menses (menstrual bleeding) begins again. Here, estrogen and progesterone gradually rise until the mid-luteal phase where both hormones drop in levels if the egg is not fertilized. The menstrual cycle begins again with menses. A summary of the hormonal changes and associated effects on the body can be found in Table 1.

There are a few key components to take note of during the menstrual cycle that have the potential to stress the well-being of women. During the latter portion of the menstrual cycle (luteal phase) and into the menstruation phase, young and middle-aged women are likely to experience premenstrual syndrome (PMS) that results in negative physical, emotional, and

behavioural symptoms (e.g., negative affect, pain; Dickerson et al., 2003). It is important to note that PMS is a cyclic, chronic recurrence—it is not a one-off occurrence (Schamlenberger et al., 2021). PMS symptoms affects approximately 85 percent of women and approximately 2 to 10 percent of women report disabling symptoms (Dickerson et al., 2003). Symptoms can range from behavioural (e.g., fatigue, dizziness) to psychological (e.g., lack of self-esteem, depressed mood, lack of concentration) to physical symptoms (e.g., headaches, abdominal pain, nausea; Daugherty, 1998; Moline & Zendell, 2000).

While a woman experiences various hormonal changes throughout their menstrual cycle, my thesis will test hypothesis related to the actual menstruation phase, that is the days in which women experience menstrual bleeding. The motivation for focusing on this specific phase is that in this thesis is that women who are menstruating experience recurring, predictable symptoms and are going through a period of intense change within their body. Sex hormones plummet then slowly rise again during menstruation and, physically, the body is repairing itself. As such, despite the menstruation period of a woman's cycle being only approximately 2-8. days, the physiological changes a woman experiences during that time have powerful effects on their body that I argue can influence their work outcomes. I discuss those physiological changes and suggest how they manifest in work behaviours via the conservation or resources theory which I outline in the next section.

Conservation of Resources Theory

COR theory is a motivational and stress theory that states that to ensure their survival, humans strive to protect, acquire, and maintain resources that they value (Hobfoll, 1989; 2001). COR Theory relies on four distinct principles that explain why organizational stress occurs (Hobfoll et al., 2018). The first principle suggests resource loss is disproportionally more salient

than resource gain. When resource loss occurs, it does so with greater magnitude and impact on the individual. Second, to gain, recover, or protect personal resources, individuals must invest in existing resources. Third, when resource loss is salient, resource gain becomes more important and increased in value to the individual. Finally, when personal resources are threatened, individuals strive to preserve them in a defensive way (Hobfoll et al., 2019).

Halbesleben and colleagues (2014) define resources as "anything perceived by the individual to help attain his or her goals" (p. 1339). While this definition is wide in scope, it provides the basic context and flexibility to uniquely define resources based on an individual or group (Halbesleben et al., 2014). Recent decades of research have supported the claim that a lack of personal resources stemming from physiology can have harmful effects on organizational outcomes (Byrne et al., 2014; Halbesleben, 2006). Byrne and colleagues (2014) found that when leaders are in a state of resource depletion via depressive symptoms, anxiety, or workplace alcohol consumption they engaged in less transformational leadership behaviours and more abusive supervision. Similarly, Barnes et al. (2011) highlight how a low level of sleep and sleep quality may promote unethical leadership behaviour via diminished resources.

While previous studies have captured physiological processes as sources of resource depletion, these were all studies that captured bodily processes that occurred as a relatively low-base rate event. Rates of anxiety, depression, poor sleep, and alcohol consumption while, increasing as a result of contextual factors such as lack of work-life balance or global events (Frone et al., 1997; Lakhan et al., 2020), these experiences continue to impact only a small segment of the population and are often low frequency events. Menstruation, however, impacts 26 percent of the global population (UNICEF, 2018) and is a repeated monthly even that occurs approximately 12 times per year. Given that previous research has found that these low

frequency, low base rate physiological experiences can influence work outcomes, it is important to examine the extent to which repeated physiological experiences impacting half of the workplace might act as a source of resource depletion and work outcomes. By doing this, organizations can better acknowledge and understand how to help replenish resources if, in fact, menstruation does act as a source of resource depletion that can negatively impact work outcomes via two indictors of resource depletion, namely self-control and affect.

Theoretical Development

Menstruation as a Source of Resource Depletion

To understand how menstruation acts as a source of resource depletion, I primarily rely on the physiological effects of menstruation, suggesting that menstruation can deplete a woman's resources via decreased energy, cognition, and physical manifestations. Throughout the menstrual cycle, estrogen and progesterone vary in levels, with progesterone levels being highest during the luteal phase (pre-menstruation/post-ovulatory, approximately 1 to 10 days before menstruation) and during the menstrual phase (when women experience menstrual bleeding), while estrogen levels at their lowest. A high level of progesterone causes a decrease in physical and mental energy and increase in metabolic rate (Johnson et al., 1994) and causes a demand for increased energy, whereby women consume approximately 686 more calories a day around menstruation than compared to the follicular or ovulatory phases (Johnson et al., 1994). In addition, the progesterone hormones influence sleep via a neurotransmitter called gamma-aminobutyric acid (GABA), which has a calming effect on human brain function (Calogero et al., 1999). GABA also negatively influences mood, memory, and learning domains (Barth et al., 2015). During menstruation, GABA inhibits allopregnanolone, a metabolite of progesterone, which influences cognition by decreasing levels of facial recognition and episodic memory in

most women (Barth et al., 2015). Only after menstrual bleeding terminates does progesterone begin to return to baseline levels. Finally, women physically experience the reparation of the lining of the uterus during menstruation each month, which some medical scholars compare to the reparation of a wounded body part (Critchley et al., 2020).

Taken together, I suggest menstruation provides a unique context for resource loss. As resources themselves are the primary defense against further resource loss (Hobfoll, 2011), women who are utilizing internal resources to employ a monthly, natural process and regulate any symptoms will be increasingly vulnerable to resource loss. Indeed, studies have found a similar phenomenon among bodily processes and resource loss. For example, in a cross-sectional study, Geukes et al. (2012) found a significant negative correlational between menopausal symptoms and work ability. In another study, Christian and colleagues' (2015) tracked workers who experienced somatic pain on a daily basis to examine extra-role and work withdrawal behaviours. Their study found that when workers had somatic pain complaints, they had depleted personal energy, thus leading to less proactive behaviours and increasing work withdrawal. From a body perspective, Michel's (2011) ethnographic study studied the effects of workers' bodies when they experienced physical and mental detriments. Some participants reported constant anxiety and increased incidences of illnesses like heart problems and diabetes, and a result, they had a more difficult time controlling and pushing their bodies to adhere to high performance work demands (e.g., staying late at the office) thus, work performance declined (Michel, 2011). Organizational behaviour studies have primarily applied COR theory and resource loss in the psychological stress context (e.g., Barling & Frone, 2017; Trougakos et al., 2015), however I extend the stress argument to menstruation as a physiological stressor whereby menstruation is a source of stress for women, thus creating a context for resource loss. In the following sections, I

outline how resource loss that is triggered by menstruation leads to lower perceived self-control and increased negative affect, which contributes to negative work outcomes.

Effects of Menstruation on Self-Control

Self-control refers to "the capacity for altering one's own responses, especially to bring them into line with standards such as ideals, values, morals, and social expectations, and to support the pursuit of long-term goals" (Baumeister et al., 2007, p. 351). Each day humans use internal resources to engage in self-control processes to override our automatic processes and fit into social norms, whether conscious or at a subconscious level (Muraven & Slessareva, 2003). This may include resisting the urge to be angry at a boss or co-worker to maintain professionalism or choosing to not eat dessert to adhere to the long-term goal of weight loss. A central tenet to COR theory is that initial resource loss begets future resource losses. Accordingly, when women are in a state of resource loss during menstruation, they are less likely to expend personal resources to engage in self-control. To explain why this occurs, I rely on the strength model of self-control (Baumeister et al., 2007), which suggests self-control becomes depleted after initial exertion and continued attempts. The resources that an individual needs to engage in self-control are finite, hence, subsequent attempts on self-control tasks becomes worse. Overall, self-control becomes impaired with continuous attempts without rest or replenishment (Muraven et al., 1998). Since conception of the strength model of self-control, numerous empirical studies have investigated what behaviours elicit self-control impairments in a work context. Behaviours like controlling emotions (Tice et al., 2001), resisting impulses (Hofmann et al., 2009), and physiological influences like lack of sleep quality (Barnes, 2011) all contribute to self-control impairment and depletion.

The relationship between menstruation and self-control is consistent with evidence from neuroscience and previous management literature that has examined physiological processes and self-control. A wealth of research has demonstrated the deleterious consequences of lack of sleep quality on work behaviour (Pilcher et al., 2015). Studies have shown that sleep is essential to replenish self-control resources (Barber & Munz, 2010), which are necessary to engage in work-related tasks like decision making (Muraven & Baumeister, 2000). To mitigate the negative effects of sleepiness, individuals must use self-regulatory resources, which is generally a depleting task (Barnes, 2012; Muraven et al., 2007). Especially in environments where individuals feel compelled to exert self-control (e.g., to adhere to social norms), workers feel more depleted and are likely to have decreased well-being (Barling & Frone, 2017). Much of why individuals are depleted when they must exert self-control in this situation reverts to physiology. When humans are sleepy, it impairs the prefrontal cortex and executive functioning (Carleton & Barling, 2020). Self-control behaviours involve heavy brain activity in the prefrontal cortex, which is brain region that is commonly associated with emotional regulation (Epperson, 2013; Gailliot & Baumeister, 2007). When activity in the prefrontal cortex is diminished, individual's self-control is impaired (Knoch & Fehr, 2007). Though sleep and menstruation do not completely draw upon the same neurological pathways, the two processes do draw some similarities. As mentioned in the previous section, allopregnanolone elicits in the cortex around menstruation, which has an inhibitory, calming effect on the nervous system (Hantsoo & Epperson, 2020). The central nervous system regulates both cognitive and affective processes, which are necessary for self-control behaviours (Robinson et al., 2010).

Building on evidence that physiological resources are required for self-control, I expect menstruation affects women's regulatory capacity such that menstruating women will draw from

their personal resources to regulate menstruation and its symptoms, thus reducing their resources available for self-control behaviours, ultimately finding a negative relationship between menstruation and self-control.

Hypothesis 1: Menstruation will be negatively related to self-control.

Effects of Menstruation on Affective States

When women are menstruating and experiencing resource depletion as a result, I argue that they are less capable of feeling positive affect. Specifically, they will experience negative affect, which is a dimension of subjective distress that includes a variety of adverse moods such as anger, contempt, distress, and irritability (Watson et al., 1998). Negative affect is supposedly a common symptom of menstruation, which could be explained through women being depleted of resources both physiologically and psychologically (e.g., Romans et al., 2012). From the physiological perspective, research has shown mixed results in terms of determining a causal link between hormones during the menstrual cycle and affect (i.e., Hengartner et al., 2017; Prasad et al., 2014), however numerous studies have found empirical evidence that suggests women experiencing physiological hormonal changes due to menstruation are less able to feel positive affect. In a review of the menstrual cycle and mood, 18 of 47 studies found an association with negative mood in the premenstrual and menstrual phase (Romans et al., 2012). Biologically, researchers have attributed the depleting levels of progesterone present during the pre-menstrual and menstrual phases to be the cause of negative affect (Dalton, 1964).

Indeed, survey studies consistently demonstrate there is a psychological connection between women's periods and affect. In a study of 42,879 Dutch women, 77.3% of women reported perimenstrual (around the time of their period) psychological complaints consistent with negative affect (e.g., feeling down/depressed; Schoep et al., 2019). More recently, Pierson et al.

(2021) analyzed 3.3 million women's menstrual symptoms globally from a mobile menstrual tracking app called Clue. On average, women felt 4 percent more sad right before they began menstruation and during menstruation than their baseline measurement (Pierson et al., 2021).

Parallel to the cognitive and bodily effects of menstruation, there are also negative effects on affect. Much of within-person studies of workplace behaviour have focused on affect as an explanatory factor of performance (e.g., Beal et al., 2005; Scott & Barnes, 2011). This episodic approach is important to this research as it highlights that affect fluctuates on a daily and hourly level, often as a result of external stimuli. To regulate one's mood requires a great deal of personal resources (Grandey, 2003). Throughout the workday, regulatory resources are required to stay focused and engage in work tasks. Beal and colleagues (2005) note that when personal resources become depleted, work tasks become more difficult to focus on and emotions begin to serve as a regulatory demand. However, emotions do not always serve as a source of resource depletion. Most commonly, affect regulation occurs when individuals must supress their negative emotions or enhance positive emotions (Wharton & Erickson, 1993). Given that actively regulating one's own emotions requires great efforts and is generally exhausting (Grandey, 2003), it is reasonable to assert individuals exerting effort to regulate affect are likely to experience negative emotions (Barnes, 2012).

This contention may be a possible explanation to why sex hormones are not the sole explanatory factor of negative affect during menstruation. COR theory posits resource loss has a great impact on an individual if resource loss and gain were equal (Westman et al., 2004). When women are menstruating, they may experience pain (e.g., headaches or cramps), feel tired, or, in general experience low amounts of personal energy (Woods et al., 1982). Given that personal

resources are required to maintain positive affect (Grandey, 2000) women should feel higher levels of negative affect during their period.

Hypothesis 2: Menstruation will be positively related to negative affect.

Work Outcomes

How monthly bodily processes, like menstruation, directly and indirectly effect work outcomes have yet to be explored. Past physiological research in management has focused on work withdrawal as an outcome of physiological processes (e.g., Christian et al., 2015), as even mild work withdrawal behaviours (e.g., lateness) can lead to more severe withdrawal behaviours like employee turnover in accordance with the withdrawal model (Koslowsky et al., 1997; Hammer et al., 2003). As such, I believe it important to understand whether menstruating has a similar and indirect relationship with work withdrawal. In addition, one of the most important work outcomes discussed by both researchers and practitioners alike, understanding the plausible indirect relationship between menstruation and job satisfaction is important, particularly noting its relationship with affect (Saari & Judge, 2004). I use two mechanisms of resource depletion—depleted self-control and negative affect—to predict why menstruation might influence these outcomes of interest.

Work Withdrawal

Work withdrawal behaviours have traditionally encompassed visible behaviours where workers are, in some manner, absent from work (e.g., lateness, absenteeism; Johns, 2001). However, more recent research includes work withdrawal behaviours that are less visible like presenteeism, emotional exhaustion, cognitive distraction, and work neglect (Carleton & Barling, 2020; Hemp, 2004). Less visible work withdrawal behaviours are especially pertinent with

respect to menstruation as individuals are likely to attend work while experiencing negative symptoms as it is typically not viewed as an illness. Less visible illnesses that cause discomfort are theorized to effect how individuals use their personal resources, as these individuals focus on their discomfort more than other competing demands (Crombez et al., 1999). For instance, Christian et al. (2015) found workers experiencing pain had less work engagement thus leading to increased work withdrawal behaviours. Even when employees are experiencing emotional discomfort (i.e., emotional exhaustion) it is associated with withdrawal behaviours like turnover intentions (Cole et al., 2010). These events are consistent with COR theory; individuals low on personal resources should attempt to minimize further loss (Hobfall, 1989) and when they are unsuccessful, they engage in withdrawal mechanisms (Deery et al., 2002).

Numerous studies have demonstrated that when employees are low in self-control resources, they are likely to engage in work withdrawal behaviours. For instance, Diestel and Schmidt (2012) found self-control demands were related to psychological strain, anxiety, and absenteeism. Similarly, in Chong and colleagues' (2020) daily study, results indicated that when workers have low personal resources (e.g., emotionally exhausted) it leads to next-day work withdrawal behaviours. This relationship was explained by past research which suggested work withdrawal as an emotion-based coping strategy for exhausted employees.

When women experience lower self-control as a result of menstruation, I argue that this will subsequently lead to increased work withdrawal. As per COR theory, when individuals experience resource depletion they invest in existing resources to preserve and defend existing resources. Actively engaging in work behaviours and tasks like being mentally alert and cognitively present, requires levels of self-control resources that are likely less accessible to individuals who are depleted. As such, these individuals are more likely to engage in work

withdrawal as a means to protect resources. In summary, I predict that menstruation will indirectly increase work withdrawal behaviors as explained via a depletion effect on women's self-control levels.

Hypothesis 3: Menstruation will indirectly increase work withdrawal via decreased self-control.

Job Satisfaction

Simply defined, job satisfaction is "a pleasurable or positive emotional state resulting from appraisal of one's job or job experiences" (Locke, 1976, p. 1304). Recently, job satisfaction has been conceptualized as a social attitude in which affect has a central role as a predictor (Judge & Kinger, 2008). Judge and Larsen's (2001) review of predictors of job satisfaction suggests the two dimensions of affect (positive and negative affect) are the strongest dispositional factors. As research on job satisfaction continued into the early 2000s, studies started to suggest a substantial proportion of job satisfaction was within-person and mood dependent (Judge et al., 2017). Weiss and colleagues' (1999) study investigating joint influences of episodic levels of pleasant mood (positive affect) and an individual's judgements of job satisfaction found workers' average level of positive affect predicts assessments of overall job satisfaction. This finding indicates an oscillatory (i.e., fluctuating) pattern in workers' mood as well as positive affect leading to greater job satisfaction (Weiss et al., 1999).

A happier worker is likely to be more satisfied with their job. Judge and Ilies's (2004) multilevel study indicated a positive mood is related to increased job satisfaction. Conversely, when workers feel negative affect, they are likely to experience lower job satisfaction (Judge & Larsen, 2001). The relationship between affect and job satisfaction can be explained by affective events theory (AET; Weiss & Cropanzano, 1996), which explains the connection between mood

and feelings in the workplace. AET specifically identifies job satisfaction as an attitude that arises from affect (Carlson et al., 2011).

Women who are menstruating are likely to experience negative affect as a result of menstrual symptoms or having to exert effort to display positive emotions (Grandey, 2003). I expect emotional generalization will explain a significant part of menstruation on job satisfaction, however, based on Scott and Judge's (2006) assertion, cognitive and information processing will also play a role. In their study examining the relationship between insomnia and job satisfaction, Scott and Judge (2006) suggest Motowidlo's (1996) information-processing of job satisfaction can explain why individuals experiencing discomfort may evaluate their jobs less favourably. The information processing model of job satisfaction posits that individuals retrieve evaluative information from memory when making evaluative judgements about their job. If individuals cannot retrieve evaluative information, they rely on a recent sample of such information. This has two implications for menstruating women. First, as mentioned in previous sections, neurotransmitters and metabolites released around menstruation temporarily impair memory. Based on the information processing model of job satisfaction, these women then have to take a recent sample of events to evaluative their job, if the recent sample is positive, they evaluative their job satisfaction positively. Conversely, if the recent sample is negative, they evaluative their job satisfaction negatively. This suggests that individuals' ratings of job satisfaction will depend on the valence of recent experiences. Thus, the second implication is that menstruation is typically a negative experience for many women. In accordance with this model, women should evaluate their recent experiences more negatively and thus, job satisfaction.

Menstruation entails a wide array of symptoms that cause physical and emotional discomfort (Schoep et al., 2019) and requires women to attend to 'leaky' bodily needs (Sang et

al., 2021). As a result, the adverse and unpleasurable aspects of menstruation are likely to great a greater proportion of negative events in one's day, which ultimately results in decreased satisfaction with one's job. Thus,

Hypothesis 4: Menstruation will indirectly decrease job satisfaction via increased negative affect.

Methods

Experience Sampling Methodology

To capture lived, within-person experiences of menstruation on work outcomes I utilized experience sampling methodology (ESM) to conduct this study. ESM is similar to other longitudinal designs where its primary main purpose is to capture and study within-person processes. However, ESM differs as it emphasizes an individual's change in state or behaviour that influences the status of other events, states, or behaviours within a short period of time (Gabriel et al., 2019). In Schmalenberger and colleagues' (2021) recommendations of best practices for studying the menstrual cycle, they state that the menstrual cycle is fundamentally a within-person process and must be treated as such in methodological design. ESM creates nested data, in other words, within-person measures (level 1 measures) are nested in days or between-person measure (level 2 measures). This is advantageous for studying menstruation as daily behaviours are nested within days that can be easily analyzed for within- and between-person relationships.

Overall, ESM obtains a systematic random sample of daily life, thus providing a measure of how participants are feeling or behaving during their typical day (Csikszentmihalyi & Larson, 2014). This methodology is especially appropriate given the unique nature of the menstruation and the menstrual cycle. In Gabriel and colleagues' (2019) review of trends and considerations

of ESM, they highlight the importance of capturing the entirety of a cycle with respect to the phenomenon of interest. A study by Liu and West (2016) examined the potential statistical effects of omitting components of cycles from analyses. They found that omission of cycles from models examining typical predictor-criterion effects significantly increased Type I error and biased estimates (Gabriel et al., 2019; Liu & West, 2016). Thus, for the purpose of this thesis, it is important to capture the entirety of the menstrual cycle (approximately 28 days; Crienin et al., 2004; Schmalenberger et al., 2021) and included in the statistical analyses.

Pilot Study

A pilot study is a small-sample, quantitative study that proceeds a larger study (Polit & Hungler, 2003). Though commonly used in health-related disciplines, quantitative pilot studies have recently become a popular tool in the social sciences (Malmqvist et al., 2019). Pilot studies typically have two purposes: (1) to test smaller versions of a study to determine its feasibility and/or (2) to test a particular research instrument (Malmqvist et al., 2019). I conducted a pilot study to determine an estimate of participant recruitment and retention rates as well as determining logistics of daily survey administration (Arain et al., 2010). In addition, piloting this study is recommended by the online recruitment platform that was used (Prolific) to ensure all technical aspects are working and to give insight to the quality of data (Prolific, 2021).

Participants and Procedure

This study's procedures were reviewed and approved by the Memorial University of Newfoundland Interdisciplinary Committee on Ethics in Human Research (#ICEHR-20220583; this IRB protocol was used in both the pilot and main study). For the pilot study, five participants were recruited through Prolific online recruitment platform (Prolific.co). Prolific is an online platform that caters to academic researchers, which has recently gained popularity among

researchers and participants worldwide (Charalambides, 2021; Letzter, 2021; Peer et al., 2017). In a systematic comparison to other online recruitment platforms like Amazon's MTurk (mturk.com) and Crowdflower (visit.crowdflower.com), Prolific was found to be the superior recruitment platform because of its diverse participant pool, researcher transparency, and platform functionality (Palan & Schitter, 2018).

I recruited five participants from Prolific to partake in the pilot study. To be eligible participants were required to: (a) live in Canada or the United States, (b) be female, (c) be between the ages of 18 and 35, (d) work-full time (greater than 31 hours per week), (e) work a 9-5 job, (f) be fluent in English, (g) identify with the woman gender identity, (h) experience menstruation at least three days per menstrual cycle, (i) not have given birth within the past three months, be pregnant or breastfeeding, and (j) not have experienced menopause or perimenopause.

While women experience their period until upwards of 60 years of age, I recruited participants aged 35 years or less as during this time menstruation is likely to be the most disruptive in their daily life (e.g., Kennett et al., 2015). Furthermore, experiencing menstruation is not gender dependent, rather sex dependent (Regitz-Zagrosek, 2012). The focus of this thesis is individuals who identify as women and experience menstruation, as I wanted to reduce any confounding hormonal sensitivities or increases via non-birth control medication that could alter their menstrual cycle (Schmalenberger et al., 2021). I recruited women who work full-time as I wanted to ensure I collected at least four or more workdays per week for adequate statistical power. Finally, as pertinent to survey administration, I recruited women who work a '9-5' job to certify survey participants would be ending work at a similar time as well, to ensure there were not confounding variables such as lack of sleep due to night shifts.

Upon signing up to take part in this study, participants were invited to complete a baseline survey (Appendix A). This survey ensured they met the inclusion criteria and collected demographic and trait measures. Specifically, participants were asked when they anticipated their next period, if they use birth control, and if they have symptoms of pre-menstrual syndrome. As suggested by Gabriel et al. (2019), I sent participants a personal message on the Prolific messaging platform on the first day of the study indicating and thanking them for their commitment to the daily over the next 30 days.

To capture the entirety of the menstrual cycle, for 30 days (including weekends), participants were asked to complete one daily survey after they completed their workday or regular day. Because participants were located across several time zones in North America and completed their workdays at different times, I sent out the survey at 3:30pm Eastern Time. This was the earliest a participant finished their workday.

In the daily survey (Appendix B), participants first reported if they were experiencing menstrual bleeding, if they worked that day and for how long, and how long they slept the previous night. I then asked participants to respond to shortened measures of job satisfaction, stress, fatigue, self-control, self-esteem, presenteeism, work withdrawal, affect, happiness, task performance, perceived organizational support, and co-worker social support. Work-related measurements were not included on days participants indicated they did not attend work. Pilot participants completed the daily survey in 1 minute and 40 seconds, on average (*SD*= 93 seconds; median= 83 seconds).

I collected more variables in my survey than I analyzed in this thesis for two reasons. First, I wanted to ensure I measured various aspects of work outcomes (e.g., social support, individual performance) and their mechanisms (e.g., self-control, affect). Secondly, as I was

collecting data across data across the entire menstrual cycle, and intend to analyze the entire cycle and its respective phases, I wanted to account for a variety of relationships. However, for the purpose and scope of this thesis, I have selected to focus on the menstruation phase and the variables related to my theorizing. I will analyze the full cycle and its effects on other outcomes at a later time, but this is beyond the scope of this current thesis.

Pilot participants were compensated 1.19 British pound sterling (GBP) (2.01 Canadian dollar [CAD]) for completion of the baseline survey and 0.59 GBP (1 CAD) for completion of each daily survey. Overall, participants could earn a maximum of 18.89 GBP (approximately 32.00 CAD). The pilot study had a response rate of 46.2% or 13.8 days (*SD*= 13.4 days; median= 9.0 days). Of the five women who began the daily study, two of them completed more than half of the surveys. The average age of participants was 27.4 years (*SD*=3.05 years; median= 26.0 years). 80 percent of participants were not using birth control. Participants reported that their average menstrual cycle length (i.e., the number of days between the first day of menstrual bleeding to the first day of menstrual bleeding of their next cycle) to be 28 days (*SD*= 3.39 days; median= 28.0 days). As the purpose of the pilot study was to understand logistics of administrating this survey, results will not be reported as the small sample size would not allow for robust data analyses (Hox et al., 2010). In addition, a full description of the measures is not included for the pilot but complete details for all measures are included in the main study description.

Measurement Selection for ESM

In line with Reis and Gable's (2000) recommendation, I ensured daily assessments did not exceed 5-7 minutes in total to reduce participant attrition. Reis and Gable (2000) also recommend individual construct scales do not exceed five items; thus, all scales were shortened,

or abbreviated measures were used. A common practice in daily studies is to select items that have the highest factor loading or total correlation from multiple items (Ohly et al., 2010). However, Gabriel and colleagues' (2019) recent discussion of considerations for ESM challenges suggests to rather choose items from scales that are most relevant to the research question. From a methodological and statistical standpoint, measures may not be isomorphic across within- and between-person levels (Chen et al., 2004), which means the items with the highest loading factor may not be relevant for both within- and between-person episodes. For example, one of the highest loading factors of Lehman and Simpson's (1992) work withdrawal scale is "reported others for breaking rules or policies." This behaviour is less likely to occur on a daily basis, thus may not be appropriate for a within-person measurement (Chen et al., 2004). A lower factor loading item like "spent time daydreaming" would occur more frequently daily and would be more appropriate for a within-person measurement. In summary, choosing the highest loading factor on a scale is likely to represent a between-person measure that occurs less frequently than a within-person measure.

When choosing daily measures (level 1 measures), I first attempted to choose scales or items that were used in ESM or longitudinal studies as those measurements were previously validated for this method. If I could not find a previously used ESM scale, I used a widely used scale and selected items that best captured within-person episodes (i.e., likely to have a greater frequency or occurrence on a daily level; Gabriel et al., 2019) while still prioritizing items that have high factor loading.

I first outline the level 1 measures that I used (the ones that are measured every day of the study) and then I outline the level 2 measures that I used (the ones used for the baseline survey measured at single time point at the beginning of the study).

Main Study

Participants and Procedure

I recruited 124 women participants from Prolific to participate in the main 30-consecutive-day daily study. The same eligibility criteria described in the pilot study was used in the main study apart from two criteria. First, I expanded the age range to include women who were 40 years or younger. Once again, this is because I wanted to include women who were early in their career and menstruate. Secondly, I included participants from western Europe, specifically those from Austria, Denmark, Finland, France, Germany, Hungary, Iceland, Ireland, Luxembourg, Norway, Spain, Sweden, Switzerland, and the United Kingdom (UK). Participants initially completed a 20-minute baseline survey assessing eligibility criteria and baseline measures of menstrual symptoms, work-related behaviours, and work outcomes (level 2 measures; Appendix C). Participants who met all eligibility criteria were invited one-week later to take part in the daily study. Three participants did not meet eligibility criteria thus were not invited to the daily study. Overall, 121 women participated in the main daily study (29 participants from North America and 92 participants from Europe or the UK). On the first day of the study, I sent out a message to each individual participants via the Prolific messaging platform thanking them for their commitment to complete the survey over the next 30 days. Each day, I sent participants an email reminder to complete the daily survey at 4:30pm local time.

Participants were compensated 1.50 GBP (2.52 CAD) for completion of the 20-minute baseline survey (average completion time= 17.32 minutes). For each 5-minute daily survey completed participants received 0.63 GBP (1.06 CAD; average completion time= 5.14 minutes; Appendix D). If participants completed six or seven surveys per week, they received a bonus of

1.00 GBP (1.68 CAD). 372 bonuses were distributed over four weeks or 93 per week on average. Overall, the response rate was 84.5 percent or 25.3 days.

The sample of participants ranged from 11 countries across North America and western Europe, though over 50 percent of participants indicated they were living in the United Kingdom. The full down of country representation can be found in Figure 1. With respect to racial demographics, the majority of participants (79.4 percent) indicated their race as White, with the remaining participants indicating their race as Asian (9.5 percent), Hispanic (5.5 percent), and Black (4.8 percent). 0.8 percent of participants did not disclose their race. Participants' average age was 30.58 years (*SD*= 4.89 years; median= 30.0 years). The average menstrual cycle length was 28.4 days (*SD*= 3.60 days; median= 28.0 days) while the average length participants experienced menstrual bleeding was 5.02 days (*SD*= 1.55 days; median= 5.00 days). 39.7 percent of participants were using either hormonal or non-hormonal birth control while 60.3 percent were not.

Measures

Level 1 Measures

Menstrual Bleeding. To determine menstrual cycle start, participants responded to a "yes/no" question if they were experiencing menstrual bleeding. This variable was adapted from Motro and colleagues (2019).

Menstrual Phase. I created a dummy variable to indicate menstrual phase. Participants were asked if they experienced menstrual bleeding as part of their menstrual cycle in the past week. If participants responded "yes" participants were asked what day their menstrual bleeding began and how they would describe their menstrual bleeding (e.g., heavy, medium, light, or none). When participants were experiencing menstrual bleeding, I coded the phase as the

menstrual phase. I coded days until the halfway point of their cycle as the follicular phase. Thirdly, I coded the week (7 days) before menses as the post-luteal phase (Johnson, 2004). Finally, all remaining days were coded as the luteal phase. For the purposes of this thesis, only the menstruation phase (i.e., when participants experienced menstrual bleeding) was used.

Self-Control. To measure daily self-reports of self-control, I used the 5-item scale that Lanaj et al. (2014) and Barnes et al. (2015) selected to measure self-control in a diary study format. These items were derived from Twenge et al. (2004) widely used self-control scale (e.g., Christian & Ellis, 2011). Participants were asked to rate their agreement with the items on a 5-point Likert scale (1= strongly disagree; 5= strongly agree). Items retained for the study included "I feel drained," "my mind has felt unfocused," "It took a lot of effort for me to concentrate on something," "My mental energy is running low," and "I felt like my willpower was gone."

Affect. Daily affective states experienced by participants were assessed each day using a shortened version of Positive and Negative Affect Scale (PANAS; Watson et al., 1988). At the end of their day, participants were asked if how they were feeling right now (i.e., "I feel alert") on a 5-point Likert Scale (1= strongly disagree; 5= strongly agree). I used two items from the positive affect scale (enthusiastic and alert) and two items from the negative affect scale (distressed and irritable) based on factor loading and relevancy to the study's purpose.

Job Satisfaction. I used a shortened 7-item measure of MacDonald and MacIntyre's (1997) Generic Job Satisfaction scale to measure daily job satisfaction. Participants indicated to what extent they agreed with statements like "I feel good about my job" and "I get along with my supervisors" using a 5-point Likert scale on days they attended work.

Work Withdrawal. Perceptions of participants' own work withdrawal behaviours with the psychological withdrawal scale developed by Lehman and Simpson (1992) on days

participants attended work. Following Scott and Barnes' (2011) procedure of selecting items for diary studies, I excluded items less relevant to the sample and study from this scale. The five items retained for inclusion were "I thought about being absent today," "I left doing work duties for unnecessary reasons," "I put less effort into the job than I should have," and "I thought about leaving my current job." Participants rated their agreement with the statements on a 5-point Likert scale (1= strongly disagree; 5= strongly agree).

Level 2 Measures (Control Variables)

Birth Control Usage. Participants were asked if they used birth control. If they responded "yes" they were asked what type of birth control they used (e.g., hormonal pill, non-hormonal IUD), however, birth control was coded "0=no" and "1=yes." I controlled for birth control based on previous research that suggests contraceptives relieve menstrual symptoms (Archer, 2006).

Analytical Approach

I tested the correlational hypotheses (hypotheses 1 and 2) using SPSS 27.0 (IBM, 2020) and the multilevel hypotheses (hypotheses 3 and 4) using multilevel path analysis in Mplus 8.7 (Muthén & Muthén, 1998-2017). For the correlational hypotheses, I ran a bivariate correlation in SPSS with the within- and between-person variables noted above. I analyzed all multilevel hypotheses in Mplus. Using best practices associated with ESM as per Gabriel and colleagues' (2019) recent discussion of ESM's trends and advancement, I used an analytical approach to remedy method biases and provide evidence for psychometric properties of within-person measures. Prior to running each model (i.e., each outcome variable), I clustered the data by participant, and I centered within-person variables to each participant's individual mean to reduce unbiased estimates (Enders & Tofighi, 2007). I used a two-level model and maximum likelihood estimator to indicate a two-level multi-level model.

When running multilevel models, Mplus gives a null model result, which determines the proportion of variance in measures that is attributable to within- and between-person factors (Gabriel et al., 2019). The null model also specifies that all measures are uncorrelated. This is important to determine the reliability in ESM studies, as test-retest reliability is inconsistent with the assumptions of ESM, as this method aims to capture dynamic processes (Gabriel et al., 2019). Results of the null models indicate the within-person variance in the focal constructs ranged from 26.02%-66.39% (see Table 2). To assess the goodness-of-fit of the model, I tested examined several indices recommended by ESM methodologists (Gabriel et al., 2019). Chi-square statistics is used to compare the observed results with the expected results, comparative fit index (CFI) and Tucker-Lewis Index (TFI) examine the discrepancy between the data and hypothesized model, and the root mean square error of approximation (RMSEA) asses how far the hypothesized model is from a perfect model (Xia & Yang, 2019). Overall, indices revealed good fit (Finch & Bolin, 2017; Wu et al., 2009) for both the work withdrawal (Model 1) and job satisfaction (Model 2) models (Model 1: $\chi^2 = 886.751$; *df*= 3; CFI= 1.00; TLI= 1.00; RMSEA= 0.00; $SRMR_{within} = .000$; $SRMR_{between} = .000$; Model 2: $\chi^2 = 331.201$; *df*= 3; CFI= 1.00; TLI= 1.00; RMSEA= .00; $SRMR_{within} = .000$; $SRMR_{between} = .000$).

I removed six participants that did not have a period during the duration of the study as being able to confidently code the menstrual phase was central to the analysis. Next, to ensure adequate model estimation, I omitted 19 participants where the majority (40 percent or more) of workdays were missing. Though I collected data on both workdays and non-workdays, I only used workdays for this study as work outcomes were my primary focus. I collected data on non-working days to ensure I did not miss when participants started their period. When participants first signed up for this study, it was required that they work full-time. However, due to data being

collected in the height of the fifth wave of the Covid-19 pandemic (Lockhart, 2022), many participants acquired the virus or were required to isolate at home for an extended period of time. Thus, I retained 96 participants and collected 2650 observations.

Results

Means, standard deviations, Cronbach's alpha, and within- and between- person correlation are found in Table 3. Prior to conducting multilevel path analyses with maximum likelihood (ML) estimator on the proposed models, I first considered the relationships of menstruation on the hypothesized mediators: self-control and negative affect. Hypothesis 1 focused on the correlational direction of menstruation (i.e., menstrual bleeding) on (a) self-control (Hypothesis 1) and (b) negative affect (Hypothesis 2). Supporting this hypothesis, menstruation was negatively correlated with perceived self-control (r= -.16, p< .01) and positively related with negative affect (r= .11, p< .01). As such, on days when women were experiencing menstrual bleeding, they were more likely to experience lower levels of self-control and higher levels of negative affect.

Hypothesis 3 and 4 focused on the mediation of depleted self-control and negative affect on work outcomes work withdrawal (Hypothesis 3; Table 4) and job satisfaction (Hypothesis 4; Table 5) and indirect effects. Self-control had a significant direct effect on work withdrawal (estimate= -.446, p<.01). Negative affect also resulted in a significant direct effect on job satisfaction (estimate= -.336; p<.01). Supporting Hypothesis 3, results indicated the menstrual phase has a significant indirect within-person effect via decreased perception of self-control (estimate=.170; 95% CI [.133, .206]; self-control *R-squared* = 0.037, p=.000; work withdrawal *R-squared* = .384, p=.000; Table 4). A direct effect of menstruation on work withdrawal did not emerge (estimate= -.014; p >.05), supporting my hypothesis of an indirect effect between

menstruation and work withdrawal via self-control. For Hypothesis 4, I also found a significant indirect within-person effect for the menstrual phase on job satisfaction via negative affect (estimate= -.048; 95% CI [. -.065, -.030]; negative affect *R-squared*= .013, $p<.05$; job satisfaction *R-squared*= .170 $p=.000$; Table 5). A small significant effect of menstruation on job satisfaction was indicated (estimate=.051; $p<.05$), however the indirect relationship of menstruation on job satisfaction via affect is present and supports my fourth hypothesis. I controlled for birth control usage, which had no effect on the relationships. Birth control did not have a significant correlation with self-control, negative affect, or job satisfaction ($p>.05$). Birth control usage did have a statistically significant correlation with work withdrawal ($r= -.091$; $p>.01$), however, given the large sample (N= 2650), it is likely a significant *p* value was detected despite the variance explained in this relationship is small (Gabriel et al., 2019).

In summary, when women are menstruating, they experience higher levels of work withdrawal because of decreased self-control and lower levels of job satisfaction because of higher levels of negative affect. For visual summary of hypotheses and results please see figure 2.

Discussion

The purpose of this research was to examine how a high frequency physiological process impacts work outcomes. Building upon frameworks and research by Grandey et al. (2020) and Motro et al. (2019), I primarily considered how menstruation acts a source of resource depletion. Results indicated that on days women experience menstrual bleeding, they experience decreased perceptions of self-control and increased negative affect. Further, menstruation was indirectly related to increased work withdrawal behaviours via decreased self-control and decreased job

satisfaction via increased negative affect. Combined, these findings advance knowledge of how inevitable bodily processes impact workers and organizations.

While results suggest that women may engage in less desirable work behaviours while experiencing their period, because of its very physiological and depleting nature, this should not be the main takeaway of this study. Rather, it points to two motivating outcomes and ideas about bodies at work. COR theory has been widely used in management literature to explain how and why individuals and organizations are impacted by stressful situations (Westman et al., 2005). Relying on the principles of COR theory, the findings suggest that menstruation can be viewed as individual-level stressful situation, which result in depleted resources. As biological research suggests, menstruation and the menstrual cycle are a concert of many body systems working together, many of which are under stress around menstruation. As such, the physiology of menstruation, a naturally occurring bodily process influencing approximately half of the working population, has a recurring influence on work outcomes that signal that these workers may need resource enhancers when depleted due to menstruation.

More broadly, the findings from this thesis also expand our knowledge of the body at work. As management research has generally neglected the consequences of the body and bodily processes on the organization, this research brings to light a potential explanatory component in the organizational research equation. While bodies can be a target of organizational policies and work environments, they can also be a source of discomfort and resource depletion. As the body and the workplace are a bidirectional relationship (i.e., the body influences work and work influence the body), it is important for organizations and researchers to acknowledge and learn about the positive and negative effects workers' bodies have on workers' own well-being and

organizations. By doing this, we can recognize how to better support employees' bodies so that all bodies can be at their best levels for work.

Theoretical Implications

This research contributes to two burgeoning areas of organizational research. First, the findings contribute to further understanding the mechanisms behind COR theory. I test a biological, hormonal factor as an explanatory factor of resource depletion. While scholars have used COR theory to theorize how low-rate physiological factors like lack of sleep quality (e.g., Schmitt et al., 2017), burnout (e.g., Mo & Shi, 2017), and pain (e.g., Christian et al., 2015) impact energy and resources, this study is one of the first to investigate how monthly bodily processes contribute to resource depletion. The data suggests that menstruating women regulate their menstrual symptoms by using internal resources with the same set of resources used for work tasks and emotions (e.g., Muraven & Baumeister, 2000; Christian et al., 2015). The findings also contribute our understanding of the resource loss spiral principle of COR theory in a non-laboratory environment (Hobfall, 2011). According to COR theory, when resource loss occurs, a 'spiral' will result, such that initial losses will follow with more resource loss (Hobfall, 2011). The results indicate when women experience initial resource loss (menstruation) it will follow with further resource loss that leads to less desirable work outcomes.

The findings of this thesis also add to our understanding of bodily changes and processes that interact with the workplace. Lawrence and colleagues' (in press) recent review of organizational body work conceptualized bodies in organizations as three components: materiality (the body as an object), meaning (how individuals make sense of their body), and functionality (what the body is able to do). Much of the existing organizational research examines bodies as a domain of society or the workplace, such that the organization controls

workers bodies (e.g., Lawrence et al., in press; Michel, 2011). This thesis used an approach to understand how the strain and demands of menstruation on the body influence work behaviours, rather than investigating how societies beliefs about menstruation influence behaviour. Without full understanding of our bodies, and how their respective changes and fluctuations influence work outcomes, all of our workplace policies rest on the assumption that workers have static, always healthy bodies. This narrative is inherently false, and it must behoove organizational researchers to make considerable room for the connection between bodies and work.

Practical Implications

The findings of this research also have many practical outcomes for workers and organizations. In 2020, the American College of Obstetricians and Gynecologists (ACOG; 2015) reaffirmed their positions that the menstrual cycle is a key indicator of one's overall health and well-being. In adulthood, a regular menstrual cycle is an important indicator of a healthy reproductive system (Bae et al., 2018; Palm-Fischbacher & Elert, 2014; Wei et al., 2019). Overall, the menstrual cycle is associated with other health and well-being outcomes important to employee and organizational outcomes. Thus, it may be time for organizations to treat menstruation as less of a taboo and more of an actual factor that impacts employee health. Organizations may want to consider educating managers on menstruation and encourage teams to have open conversations about women's health. As an outcome of this research indicated that women may perform their best when they are not experiencing menstruation, organizations should promote bodily autonomy through policies like flex time, so employees can choose their work schedule and hours. Recently, 'menstrual leave' has become a popular topic in the media, after Spain adopted it for all working women (Westfall, 2022). Menstrual leave (i.e., flex time) is

an easy and proven best practice for organizations to adopt to address and accommodate menstruation so workers can perform and be their best (Van Bommel, 2021).

Though flex time is generally a best practice to accommodate individuals who need bodily autonomy, organizations and researchers may want to consider other possible interventions for workers if an organization's environment does not easily allow for flex time. A critical difference between physiological processes previously studied and biological hormonal factors is that individuals and organizations can implement interventions to alleviate the potential harms of such factors. For instance, lower sleep quality has been associated with increased unethical conduct and abusive supervision (Barnes et al., 2011; Barnes et al., 2015). To mitigate such outcomes, workers could, simply, get a better's night sleep and organizations could encourage employees not to work beyond their allocated work hours (Barnes et al., 2011). For menstruating individuals and their organizations, less known interventions are available. Contraceptives have been shown to relieve some symptoms, but do not eliminate menstruation (Archer, 2006). Hence, organizations should consider adding birth control as a part of their health insurance so at least women have the option to take it. Organizations could indicate to their support and commitment to menstruators by introducing policies like free menstrual products or adequate breaks to deal with bodily needs (Levitt & Barnack-Tavalaris, 2020). Though these policies are not necessarily interventions, previous studies have shown that workplace policies can create an inclusive environment for stigmatized employees (Héliot et al., 2020; Hossain et al., 2019).

On another note, how to 'hack' one's menstrual cycle to achieve a high level of performance has recently become popular in mainstream media and companies. Recently, Nike (2021) promoted how to harness the power of one's menstrual cycle to physically train

effectively. *Harper's Bazaar* also highlighted how one's personal energy and subsequently productivity may fluctuate according to phases of their menstrual cycle (Harris, 2021). Though interesting, evidence that menstruation and menstrual phases have influence on work outcomes has lacked because of the lack of research in this area. The findings from this study provide evidence that women engage in less productive work behaviours during their period. Thus, women may want to consider scheduling their work tasks that require less mental and physical energy if they are able to do so. This study only looked at the menstrual phase, thus, suggestions to when more intensive work should be done cannot be made at this point.

Finally, organizations may want to consider the resource caravan-creating or depleting ecology. As findings suggest women experience depleted self-control during menstruation, organizations should take initiative to create an organizational ecology that allows workers to facilitate an internal transaction of resources (Hobfoll, 2011). Directly related to menstruation, organizations may want to consider education on menstruation for all employees to reduce stigma and increase general knowledge. Organizations should also continue providing general organizational support and safety to facilitate passageways in which resources are protected and supplied (Hobfoll, 2011).

Limitations

While this study had numerous strengths (e.g., experience sampling methodology design, multilevel data analyses), it is not without limitations. First, data for the study was obtained from an online panel service (Prolific.co). Online panel services have a key advantage of allowing access to a large and accessible of young working women, which was central to this study. However, past scholars have questioned the attentiveness and representativeness of such samples. Contrary to such notions, Porter and colleagues' (2019) review of online panel data

found evidence to refute these concerns and found data quality to be similar or better than traditional samples (Behrend et al., 2011; Walter et al., 2019).

Common method biases (CMB) are a major concern in ESM studies as all data is self-reported (Podsakoff et al., 2012). To alleviate CMB for Level 1 relationships, I used person-mean centering. Several authors indicate centering around the individual person's mean yields an unbiased estimate of within-person measures (Gabriel et al., 2019; Hofmann et al., 2000; Raudenbush & Bryk, 2002).

As another methodological concern, I unexpectedly came across was participants taking a significant time from work during the study. At the end of the study, many participants indicated they, or someone in their household, contracted Covid-19, thus had to take time away from work. At the beginning of the daily survey, participants indicated if they worked at all that day. If they did not work, they were presented with a shortened version of the daily study with non-work measures (e.g., self-control, affect). Based on survey results, some participants took more than two weeks (10 business days) away from work. I omitted 19 participants who did not work for the majority of the 30-day study as some variables were unstable due to missing data. This was a limitation due to participants completed less work-related measures than initially expected. However, after removing participants I had more than enough data stability to properly analyze ESM data, given that best practices suggest that 83 participants are an excellent number for ESM (Gabriel et al., 2019).

Finally, to accurately determine menstrual phase and levels of estrogen and progesterone a blood or urine sample must be collected for each participant on each day of the study (e.g., Tennent et al., 1980; Baird et al., 1995). Due to financial and logistical factors, I could not collect blood or urine sample from participants. Instead, I followed Schmalenberger and

colleagues' (2021) best practice in distinguishing menstrual phase. Because, I was only examining menstruation, I could easily code which days participants experienced menstruation as each day they reported if they were bleeding due to their menstrual cycle and to what degree (e.g., severe, mild, none).

Directions for Future Research

There is a wealth of directions scholars can take when studying menstruation and the menstrual cycle among workers. First, scholars may want to consider the bright side of the menstrual cycle by exploring the entirety of the cycle and understand when women may be performing or feeling their best at work. I have collected data for the entire menstrual cycle, however, studying each phase and work correlates was beyond the scope of this thesis. For this thesis, I wanted to understand how the most stigmatized and visible aspect of the menstrual cycle affects work outcomes. Studies examining how the menstrual cycle interacts with physical activity found that during the follicular phase, women reach an 'athletic advantage,' or an increase in memory and focus (Nike, 2021). Existing literature exploring the menstrual cycle and behaviours focus on negative affect around the pre-menstrual phase. Studies have indicated there is no influence between the pre-menstrual phase and negative mood (Romans et al., 2012). Some studies contest the impairments women are likely to perceived rather than actual, but still have great effect on daily behaviours (Findlay et al., 2020). Taken together, scholars should look at the entirety of the menstrual cycle to observe the within-person variability and include actual and perceived measurements.

The existing menstruation study in management looks solely at 'natural cycling' women (i.e., women who are not on birth control). While I attempted to design a study that was generalizable to both naturally cycling and those on contraceptives, I did not include women who

experience period issues like endometriosis and polycystic ovary syndrome (PCOS). It is estimated that endometriosis affects roughly 10 percent of reproductive aged women (WHO, 2021) while PCOS affects between 6 and 12 percent of the same group (CDC, 2020). Women who have these either of these two diseases have a very different menstruating experience. Often, they experience significantly more pain during menstruation and throughout their menstrual cycle. Given the expanding literature on pain (e.g., Christian et al., 2015) and menstruation, researchers should aim to combine these two areas to investigate what outcomes women with endometriosis or PCOS encounter.

Researchers may also want to consider the social aspect of the menstrual cycle. While women face a variety of physiological and hormonal symptoms, they also must deal with managing their body and "leakiness" (Sang et al., 2021, p. 7). Menstruation is still viewed as a taboo subject in the workplace (Grandey et al., 2020) and women must work to conceal feminine products and any leakiness and mess (Sang et al., 2021). Scholars may want to consider what impact this has on worker performance and identify interventions that may alleviate the burden women face managing their periods (e.g., free menstrual products, health information sessions).

In the recent years, we have seen a proliferation by federal and regional governments implementing polices to benefit menstruating individuals, such as free or no-tax on menstrual products (Rodriguez, 2021) and legislated menstrual leave (Huet, 2022). While governments are taking a positive stride forward to accommodate menstruating individuals, much work is to be done in most of the world. For governments to make informed decisions on initiatives like menstrual leave, more research by management scholars must be conducted. Specifically, future research should look on the individual-level to understand the absenteeism and presenteeism

rates and loss of productivity of menstruating individuals. On an organizational level, researchers should consider the availability of supports and what benefit those have.

Finally, organizational researchers should be motivated to further investigate physiological processes in the workplace to understand how workers can flourish. Beyond the bodily processes reviewed and investigated in this study (e.g., menstruation, somatic pain, sleep), there are a wealth of other processes that are understudied or neglected. For instance, aging is an inevitable and salient process. How does the organization accommodate and manage the breakdown of workers' bodies over time? What mechanisms at work accelerate aging? While somatic pain was referred to throughout this thesis, organizational researchers still know relatively little about chronic pain despite it being a persistent component of life for many. Does somatic and chronic pain have similar mechanisms related to resource depletion and affect? Are there workplace interventions to alleviate flare ups or mechanisms to reduce pain? While this is not a comprehensive list of future directions for research for bodily processes, researchers should draw inspiration from their own bodies—how does your body affect the way you work?

Conclusion

Every day, millions of workers bring their body to work. Yet, we know so little as to how the body influences work. The aim of this study was to investigate how a specific monthly bodily process, menstruation, influences work outcomes. Little management research has attempted to understand how physiological processes act as a source for resource gain and depletion, which is necessary for many work tasks. Results indicate that menstruation acts as a source of resource depletion, negatively impacting women's work withdrawal and job satisfaction behaviours indirectly via self-control and negative affect. Emerging popular culture literature (e.g., Farokhmanesh, 2022; Francis, 2022) show that workplaces are attempting to accommodate

menstruating individuals, but each attempt is still an experiment for organizations. My goal for this research is that it starts a conversation. For with a conversation and knowledge, we begin to dismantle the perception that the very biological machinery that perpetuates mankind is somehow something to be ashamed of.

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Appendix A
Pilot Study Baseline Survey

Baseline Questionnaire

Thank you for participating in this study. This survey will determine your eligibility for the study. It will take approximately 12 minutes to complete. This survey will ask you questions about questions about your physical symptoms of menstruation, when you will expect your next period, the length of your menstrual cycle, whether or not you are pregnant, if you have any women's health issues (e.g., endometriosis), birth control, your experiences at work (e.g., job satisfaction, presenteeism), your well-being (e.g., anxiety, mood), and demographic factors like age and employment.

Please answer to the best of your ability. You may skip any questions you wish not to answer. If you decide partway through you do not wish to participate in the study, please exit this browser window and your data will not be recorded.

Do you experience menstruation (periods)?
- Yes
- No

Are you currently employed?
- Yes, full-time (35 hours or more per week)
- Yes, part-time (less than 35 hours per week)
- Full-time student
- Caregiver
- Retired
- Unemployed

Are you pregnant or given birth in the past 3 months?
- Yes
- No

Have you experienced menopause?
- Yes
- No

Do you have a chronic condition that affects your attendance at work?
- Yes
- No
- Prefer not to disclose

How would you describe your periods? Select all that apply.

- Heavy
- Normal
- Light
- Painful
- Irregular

When do you expect your next period? (Approximately):
- Month__
- Day__

On average, how long is your menstrual cycle?
- Less than 21 days
- 22 days
- 23 days
- 24 days
- 25 days
- 26 days
- 27 days
- 28 days
- 29 days
- 30 days
- 31 days
- 32 days
- 33 days
- 34 days
- 35 days or more

Are you using birth control?
- Yes
- No
- Prefer not to answer

What kind of birth control are you on?
- Hormonal birth control (e.g., the pill, the shot, hormonal IUDs)
- Non-hormonal birth control (e.g., copper IUD)
- Not sure
- Prefer not to answer

Do you experience and/or diagnosed with any of the following conditions that affect your menstrual cycle?
- Amenorrhea (absence of menstrual bleeding)
- Endometriosis
- Pelvic or uterine surgery
- Premenstrual dysphoric disorder (PMDD)
- Polycystic ovarian syndrome (PCOS)

- Other___

The next set of questions are going to focus on your experiences with menstruation. There are no right or wrong answers, we simply want to hear your honest responses to these questions.

Premenstrual Symptoms Screening Tool (PSST; Steiner, MacDougall & Brown, 2003)

Think about the days before your period.

Do you experience any of the following?

	Not at all	Mild	Moderate	Severe
Anger/irritability				
Anxiety/tension				
Tearful/increased sensitivity to rejection				
Depressed mood/hopelessness				
Decreased interest in work activities				
Decreased interest in home activities				
Decreased interest in social activities				
Difficulty in concentrating				
Fatigue/lack of energy				
Overeating/food cravings				
Insomnia				
Hypersomnia (needing more sleep)				

The next set of questions are going to focus on your experiences at work. There are no right or wrong answers, we simply want to hear your honest responses to these questions.

Job Satisfaction (MacDonald & MacIntyre, 1997)

For each statement, please select a choice to indicate your degree of agreement, on average.

	Strongly disagree	Disagree	Don't know	Agree	Strongly agree
I receive recognition for a job well done					
I feel close to people at work					
I feel good about working at this company					
I feel good about my job					
I believe management is concerned about me					
On the whole, I believe work is good for my physical health					
My wages are good					

All my talents and skills are used at work					
I get along with my supervisors					
I feel good about my job					

State-Trait Anxiety 6-item (Spielberger, 1983; Marteau & Beckker, 1992)

A number of statements which people have used to describe themselves are given below. Read each statement and then select the most appropriate number to the right of the statement to indicate how you feel right now, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe you generally feel.

	Not at all	Somewhat	Moderately	Very much
I feel calm				
I am tense				
I am upset				
I am relaxed				
I feel content				
I am worried				

PANAS-SF (Watson et al., 1988)

*This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer. Indicate to what extent **you generally feel this way**, that is, how you feel on the average. Use the following scale to record your answers*

	1- Never	2	3	4	5- Always
Interested					
Distressed					
Excited					
Upset					
Strong					
Guilty					
Scared					
Hostile					
Enthusiastic					
Proud					
Irritable					
Alert					
Ashamed					
Inspired					
Nervous					

Determined					
Attentive					
Jittery					
Active					
Afraid					

Stanford Presenteeism Scale (6 item; Koopman et al., 2002)

Thinking about yourself over the past month, rate your agreement with the statements below.

	1- Never	2	3	4	5- Always
The stresses of my job were much harder to handle					
I was able to finish hard tasks in my work					
I was distracted from taking pleasure in my work					
I felt hopeless about finishing certain work tasks					
At work, I was able to focus on achieving my goals					
I felt energetic enough to complete all my work					

Thank you for your participation. Lastly, we want to collect a few demographic measures from you.

What is your age?

____

Please specify your gender.

- Woman
- Man
- Trans woman
- Trans man
- Non-binary
- Other____

Please specify your marital status:

- Married/common law
- Widowed
- Divorced
- Separated
- Never married

Thinking about your spouse's current job status, where would you position your job status relative to theirs? (1 indicating "my job status is significantly lower than my partner's"; 5 indicating "my job status is significantly higher than my partner's"

1	2	3	4	5

Within my relationship, who would you consider the primary breadwinner?

- Myself
- My partner

Do you have children?

- Yes
- No

How many children do you have?

____

Which categories describe you? Select all that apply to you:

- Indigenous – For example Inuit, Métis people, Iroquois, First Nations, etc.
- Asian – For example, Chinese, Filipino, Asian Indian, Vietnamese, Korean, Japanese, etc.
- Black or African American – For example, Jamaican, Haitian, Nigerian, Ethiopian, Somalian, etc.
- Hispanic, Latino, or Spanish Origin – For example, Mexican, Puerto Rican, Cuban, Salvadorian, Dominican, Colombian, etc.
- Middle Eastern or North African – For example, Lebanese, Iranian, Egyptian, Syrian, Moroccan, Algerian, etc.
- Native Hawaiian or other Pacific Islander – For example, Native Hawaiian, Samoan, Chamorro, Tongan, Fijian, Marshallese, etc.
- White – For example, German, Irish, English, Italian, Polish, French, etc.,
- Some other race, ethnicity, or origin, please specify: _____
- I prefer not to answer.

What is the highest level of school you have completed?

- Less than high school diploma
- High school diploma or equivalent
- Some college/university but no degree/diploma
- College/university certificate or diploma
- Bachelor degree
- Graduate degree or above

What industry do you work in?

- Accountancy, banking or finance
- Business, consultancy or management
- Charity or voluntary work

- Computing or IT
- Creative arts or design
- Energy and utilities
- Engineering or manufacturing
- Environment or agriculture
- Healthcare
- Hospitality or events
- Law
- Law enforcement and security
- Leisure, sport or tourism
- Marketing, advertising or PR
- Media or digital
- Property or construction
- Public services or administration
- Recruitment or HR
- Retail
- Sales
- Science or pharmaceuticals
- Social care
- Teacher training or education
- Transport or logistics
- Student
- Other___

Do you have work from home arrangements? (i.e, hybrid work, entirely work from home)

- Yes
- No

What percentage do you work from home?

—

Appendix B
Pilot Study Daily Survey

Daily Questionnaire

1. **Are you experiencing menstrual bleeding today?**
- Yes
- No

[if yes]

2. **What day of your cycle are you on? (1 being the first day of menstrual bleeding)**

_____

3. **Did you work today? This could be all day or for a few hours.**
- Yes
- No

[if yes]

a. How many hours did you work today?

_____

[if participated worked today]

Based on how you are feeling today, please respond to the following statements.

5-point Likert: 1= strongly disagree; 5= strongly agree

Construct	Item	Reference
1. Job satisfaction	I feel good about my job	MacDonald & MacIntyre, 1997 (Generic Job Satisfaction Scale) (.77)
2. Job satisfaction	I get along with my supervisors	MacDonald & MacIntyre, 1997 (Generic Job Satisfaction Scale) (.46)
3. Job satisfaction	I receive recognition for a job well done	MacDonald & MacIntyre, 1997 (Generic Job Satisfaction Scale) (.70)
4. Job satisfaction	I feel close to the people I work with	MacDonald & MacIntyre, 1997 (Generic Job Satisfaction Scale) (.57)
5. Job satisfaction	I feel good about working at this company	MacDonald & MacIntyre, 1997 (Generic Job Satisfaction Scale) (.64)
6. Job satisfaction	I believe management is concerned about me	MacDonald & MacIntyre, 1997 (Generic Job Satisfaction Scale) (.59)

7. Job satisfaction	On the whole, I believe work is good for my physical health	MacDonald & MacIntyre, 1997 (Generic Job Satisfaction Scale) (.52)
8. Stress	I feel stressed right	Littman, White, Sitia, Bowen, & Kristal, 2006 (Single item measure)
9. Fatigue	I feel fatigued	Van Hooff, Geurts, Kompier, & Taris, 2007. Single item
10. Self-control	I feel drained	Christian & Ellis, 2011 (Self-Control Capacity Scale)
11. Self-control	My mind has felt unfocused	Christian & Ellis, 2011 (Self-Control Capacity Scale)
12. Self-control	It took a lot of effort for me to concentrate on something	Christian & Ellis, 2011 (Self-Control Capacity Scale)
13. Self-control	My mental energy is running low	Christian & Ellis, 2011 (Self-Control Capacity Scale)
14. Self-control	I felt like my willpower was gone	Christian & Ellis, 2011 (Self-Control Capacity Scale)
15. Self-esteem	I have high self-esteem	Robins, Hendin, Trzseniewski, 2001
16. Presenteeism	I was able to finish hard tasks in my work	Koopman et al., 2002 (Stanford Presenteeism Scale) (.88)
17. Presenteeism	I was able to focus on achieve my goals	Koopman et al., 2002 (Stanford Presenteeism Scale) (.86)
18. Presenteeism	The stresses of my job were much harder to handle today	Koopman et al., 2002 (Stanford Presenteeism Scale) (.87)
19. Work withdrawal	Thoughts of being absent	Lehman & Simpson, 1992 (Psychological Withdrawal Behaviours) (.75)
20. Work withdrawal	Left doing your work duties for unnecessary reasons	Lehman & Simpson, 1992 (Psychological Withdrawal Behaviours) (.72)
21. Work withdrawal	Put less effort into the job than you should have	Lehman & Simpson, 1992 (Psychological Withdrawal Behaviours) (.66)
22. Work withdrawal	Thought about leaving current job	Lehman & Simpson, 1992 (Psychological Withdrawal Behaviours) (.62)
23. Work withdrawal	I daydreamed	Lehman & Simpson, 1992 (Psychological Withdrawal Behaviours) (.72)

24. Positive affect	I feel enthusiastic	Watson, Clark, & Tellegen, 1998 (PANAS) (.75)
25. Positive affect	I feel alert	Watson, Clark, & Tellegen, 1998 (PANAS) (.63)
26. Negative affect	I feel distressed	Watson, Clark, & Tellegen, 1998 (PANAS) (.67)
27. Negative affect	I feel irritable	Watson, Clark, & Tellegen, 1998 (PANAS) (.55)
28. Happiness	I feel happy	Abdel-Khalek, 2006 (Single item happiness)
29. Daily task performance	I adequately completed assigned duties	Williams & Anderson (1991) (.83)
30. Daily task performance	I performed the tasks that were expected of me	Williams & Anderson (1991) (.87)
31. POS	My organization cares about my well-being	Eisenberger et al., (2001) (.80)
32. POS	My organization takes pride in my accomplishments	Eisenberger et al., (2001) (.79)
33. Social Support	My coworkers really care about me	Ducharme et al., (2000) (.81)
34. Social Support	I feel appreciated by my co-workers	Ducharme et al., (2000) (.71)
35. Social Support	My coworkers would fill in for me if I were absent	Ducharme et al., (2000) (.78)
36. Social Support	My coworkers give useful advice on job problems	Ducharme et al., (2000) (.62)

[if participant did not work today]

Construct	**Item**	**Reference**
1. Stress	I feel stressed right now	Littman, White, Sitia, Bowen, & Kristal, 2006 (Single item measure)
2. Fatigue	I feel fatigued	Van Hooff, Geurts, Kompier, & Taris, 2007. Single item
3. Self-control	I feel drained	Christian & Ellis, 2011 (Self-Control Capacity Scale)
4. Self-control	My mind has felt unfocused	Christian & Ellis, 2011 (Self-Control Capacity Scale)

5. Self-control	It took a lot of effort for me to concentrate on something	Christian & Ellis, 2011 (Self-Control Capacity Scale)
6. Self-control	My mental energy is running low	Christian & Ellis, 2011 (Self-Control Capacity Scale)
7. Self-control	I felt like my willpower was gone	Christian & Ellis, 2011 (Self-Control Capacity Scale)
8. Self-esteem	I have high self-esteem	Robins, Hendin, Trzseniewski, 2001
9. Positive affect	I feel enthusiastic	Watson, Clark, & Tellegen, 1998 (PANAS) (.75)
10. Positive affect	I feel alert	Watson, Clark, & Tellegen, 1998 (PANAS) (.63)
11. Negative affect	I feel distressed	Watson, Clark, & Tellegen, 1998 (PANAS) (.67)
12. Negative affect	I feel irritable	Watson, Clark, & Tellegen, 1998 (PANAS) (.55)
13. Happiness	I feel happy	Abdel-Khalek, 2006 (Single item happiness)

Appendix C
Main Study Baseline Survey

[CONSENT FORM]

Thank you for participating in this study. This survey will determine your eligibility for the study. It will take approximately 12 minutes to complete. This survey will ask you questions about your physical symptoms of menstruation, when you will expect your next period, the length of your menstrual cycle, whether you are pregnant, if you have any women's health issues (e.g., endometriosis), whether you use birth control, your experiences at work (e.g., job satisfaction, presenteeism), your well-being (e.g., anxiety, mood), and demographic factors like age and employment.

Please answer to the best of your ability. You may skip any questions you wish not to answer. If you decide partway through you do not wish to participate in the study, please exit this browser window and your data will not be recorded.

Do you experience menstruation (periods)? [MENS]
- Yes
- No

Are you currently employed? [EMP]
- Yes, full-time (35 hours or more per week)
- Yes, part-time (less than 35 hours per week)
- Full-time student
- Caregiver
- Retired
- Unemployed

Are you pregnant or have you given birth in the past 3 months? [PREG]
- Yes
- No

Have you experienced or are you currently experiencing menopause? [MENO]
- Yes
- No

Do you have a chronic condition that affects your attendance at work? [CHRC]
- Yes
- No
- Prefer not to disclose

How would you describe your periods? Select all that apply. [MDES]

- Heavy
- Normal
- Light
- Painful
- Irregular

When was the first day of your most recent period?
- Month__
- Day__

How confident are you in this date?
1= not confident at all; 5= for certain

When do you expect your next period? (Approximately): [NPER]
- Month__
- Day__

On average, how long is your menstrual cycle? [CL]
- Less than 21 days
- 22 days
- 23 days
- 24 days
- 25 days
- 26 days
- 27 days
- 28 days
- 29 days
- 30 days
- 31 days
- 32 days
- 33 days
- 34 days
- 35 days or more

Are you using birth control? [BC]
- Yes
- No
- Prefer not to answer

What kind of birth control are you on? [BCK]
- Hormonal birth control- not IUD (e.g., the pill, the shot)
- Hormonal IUD (e.g., Kyleena, Mirena)
- Non-hormonal birth control (e.g., copper IUD)
- Not sure
- Prefer not to answer

Do you currently experience and/or are diagnosed with any of the following conditions that affect your menstrual cycle? [MCOND]

- Amenorrhea (absence of menstrual bleeding)
- Endometriosis
- Pelvic or uterine surgery
- Premenstrual dysphoric disorder (PMDD)
- Polycystic ovarian syndrome (PCOS)
- Other___

The next set of questions are going to focus on your experiences with menstruation. There are no right or wrong answers, we simply want to know your honest responses to these questions.

Premenstrual Symptoms Screening Tool (PSST; Steiner, MacDougall & Brown, 2003)

Think about the days before your period.

Do you experience any of the following?

	Not at all	Mild	Moderate	Severe
Anger/irritability				
Anxiety/tension				
Tearful/increased sensitivity to rejection				
Depressed mood/hopelessness				
Decreased interest in work activities				
Decreased interest in home activities				
Decreased interest in social activities				
Difficulty in concentrating				
Fatigue/lack of energy				
Overeating/food cravings				
Insomnia				
Hypersomnia (needing more sleep)				

The next set of questions are going to focus on your experiences at work. There are no right or wrong answers, we simply want to know your honest responses to these questions.

Job Satisfaction (MacDonald & MacIntyre, 1997)

For each statement, please select a choice to indicate your degree of agreement, on average.

	Strongly disagree	Disagree	Don't know	Agree	Strongly agree
I receive recognition for a job well done					
I feel close to people at work					

I feel good about working at my company					
I feel good about my job					
I believe management is concerned about me					
On the whole, I believe work is good for my physical health					
My wages are good					
All my talents and skills are used at work					
I get along with my supervisors					
I feel secure about my job					

Trait Anxiety 5-item (Spielberger, 1983; Zsido et al., 2020)

A number of statements which people have used to describe themselves are given below. Read each statement and then select the value corresponding to the statement that indicates how you generally feel.

There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

	Not at all	Somewhat	Moderately	Very much
I feel that difficulties are piling up so that I cannot overcome them				
I worry too much over something that really doesn't matter				
Some unimportant thoughts run through my mind and bothers me				
I take disappointments so keenly that I can't put them out of my mind				
I get in a state of tension or turmoil as I think over my recent concerns and interests				

PANAS-SF (Watson et al., 1988) [PANAS]

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer. Indicate to what extent ***you generally feel this way****, that is, how you feel on the average. Use the following scale to record your answers*

	1- Never	2	3	4	5- Always
Interested					
Distressed					
Excited					

Upset					
Strong					
Guilty					
Scared					
Hostile					
Enthusiastic					
Proud					
Irritable					
Alert					
Ashamed					
Inspired					
Nervous					
Determined					
Attentive					
Jittery					
Active					
Afraid					

Self-Control Scale (Shortened; Tangney et al., 2004) [SC]

Thinking about yourself over the past six months, rate your agreement with the statements below.

	1- Not at all	2	3	4	5- Very much
I am good at resisting temptation					
I have a hard time breaking bad habits					
I am lazy					
I say inappropriate things					
I do certain things that are bad for me, if they are fun					
I refuse things that are bad for me					
I wish I had more self-discipline					
People would say that I have iron self-discipline					
Pleasure and fun sometimes keep me from getting work done					
I have trouble concentrating					
I am able to work effectively towards long-term goals					
Sometimes I can't stop myself from doing something, even if I know it is wrong					
I often act without thinking through all the alternatives					

Stanford Presenteeism Scale (6 item; Koopman et al., 2002) [SPS]

Thinking about yourself recently, rate your agreement with the statements below.

	1- Never	2	3	4	5- Always
The stresses of my job were much harder to handle					
I was able to finish hard tasks in my work					
I was distracted from taking pleasure in my work					
I felt hopeless about finishing certain work tasks					
At work, I was able to focus on achieving my goals					
I felt energetic enough to complete all my work					

Psychological Work Withdrawal Behaviours (Lehman & Simpson, 1992) [WW]

Thinking about yourself at work over the past six months, rate your agreement with the statements below.

	1- Not at all	2	3	4	5- Very much
I thought about being absent					
I chat with my co-workers about non-work topics					
I left my work station for unnecessary reasons					
I daydreamed					
I spent work time on personal matters					
I put less effort into my job than I should have					
I thought about leaving my current job					
I let others do my work for me					

Perceived Organizational Support (Eisenberger et al., 2001) [POS]
Thinking about yourself and your organization over the past six months, rate your agreement with the statements below.

	1- Strongly disagree	2	3	4	5	6	7- Strongly Agree
My organization takes pride in my accomplishments							
My organization really cares about my well-being							
My organization values my contributions to its well-being							
My organization strongly considers my goals and values							

My organization shows little concern for me							
My organization is willing to help me if I need a special favour							

Co-worker Social Support Scale (Duchrarme & Martin, 2000; Rousseau & Aube, 2010) [CSS]

Thinking about yourself and your coworkers over the past six months, rate your agreement with the statements below.

	1- Strongly disagree	2	3	4	5	6	7- Strongly Agree
Your coworkers really care about you							
You feel close to your coworkers							
Your coworkers take a personal interest in you							
You feel appreciated by your coworkers							
Your coworkers are friendly to you							
Your coworkers would fill in while you're absent							
Your coworkers are helpful in getting the job done							
Your coworkers give useful advice on job problems							
Your coworkers assist with unusual work problems							
Your coworkers assist with unusual work problems							
Your coworkers will pitch in and help							
Your coworkers care about your physical and mental health							
Your coworkers recognize your contributions and your strengths							
Your coworkers communicate work-related information to you							
Your coworkers help you to develop your skills and competencies							
Your coworkers share their knowledge and their work experience with you							

Thank you for your continued participation. We have just a few last questions related to your demographic information.

What is your age? [AGE]

____

Please specify your gender. [GEN]

- Woman
- Man
- Trans woman
- Trans man
- Non-binary
- Other____

Please specify your marital status:

- Married/common law
- Widowed
- Divorced
- Separated
- Never married

Thinking about your spouse's current job status, where would you position your job status relative to theirs? (1 indicating "my job status is significantly lower than my partner's"; 5 indicating "my job status is significantly higher than my partner's"

1	2	3	4	5

Within my relationship, who would you consider the primary breadwinner?

- Myself
- My partner

Do you have children?

- Yes
- No

How many children do you have?

____

Which categories describe you? Select all that apply to you:

- Indigenous – For example Inuit, Métis people, Iroquois, First Nations, etc.
- Asian – For example, Chinese, Filipino, Asian Indian, Vietnamese, Korean, Japanese, etc.
- Black or African American – For example, Jamaican, Haitian, Nigerian, Ethiopian, Somalian, etc.
- Hispanic, Latino, or Spanish Origin – For example, Mexican, Puerto Rican, Cuban, Salvadorian, Dominican, Colombian, etc.
- Middle Eastern or North African – For example, Lebanese, Iranian, Egyptian, Syrian, Moroccan, Algerian, etc.

- Native Hawaiian or other Pacific Islander – For example, Native Hawaiian, Samoan, Chamorro, Tongan, Fijian, Marshallese, etc.
- White – For example, German, Irish, English, Italian, Polish, French, etc.,
- Some other race, ethnicity, or origin, please specify: _____
- I prefer not to answer.

What is the highest level of school you have completed?

- Less than high school diploma
- High school diploma or equivalent
- Some college/university but no degree/diploma
- College/university certificate or diploma
- Bachelor degree
- Graduate degree or above

What industry do you work in?

- Accountancy, banking or finance
- Business, consultancy or management
- Charity or voluntary work
- Computing or IT
- Creative arts or design
- Energy and utilities
- Engineering or manufacturing
- Environment or agriculture
- Healthcare
- Hospitality or events
- Law
- Law enforcement and security
- Leisure, sport or tourism
- Marketing, advertising or PR
- Media or digital
- Property or construction
- Public services or administration
- Recruitment or HR
- Retail
- Sales
- Science or pharmaceuticals
- Social care
- Teacher training or education
- Transport or logistics
- Student
- Other___

Are you currently in a leadership or supervisory role?

- Yes
- No

Does your organization offer specific supports for individuals who menstruate? (select all that apply}

- Accessible facilities to tend to menstrual needs
- Adequate breaks to tend to menstrual needs
- Free menstrual products
- Health insurance policies that cover reproductive health (e.g., birth control)
- Menstruation leave
- Work from home flexibility
- Other __
- None

To what extent does your company support people who menstruate?
[1= no support; 3= some support; 5= a high degree of support]

Do you have work from home arrangements? (i.e, hybrid work, entirely work from home)

- Yes
- No

What percentage do you work from home?

__

In an average month, how often do you work overtime or beyond your allocated hours?

For instance, you're required to work 7.5 hours per day but work 8 or more hours.

- Never
- Rarely (approx. 1-4x per month)
- Occasionally (5-9x per month)
- Frequently (approx. 10-14x per month)
- Very frequently (more than 14 times per month)

In which way are you compensated?

- Salary (i.e., $50,000 per year)
- Wage (i.e., $15 per hour)
- Commission/Variable
- Other___
- Prefer not to answer

[Qualitative Question] Do you have any questions about this study or your commitment to completing a daily survey for 30 days beginning on February 14, 2022?

_____

Thank you for completing this survey,

You will begin receiving surveys in the evening of February 14, 2022 at 4:00PM local time. You will have until 12AM to complete the survey each day.

A reminder will be sent to your Prolific email when the survey is available to complete. You will receive £0.63 for every survey you complete and a bonus of £1 if you complete 6 of the 7 surveys in a week.

We thank you again for your commitment to complete a brief daily survey everyday starting on February 14, 2022.

If you have any questions please do not hesitate to contact us.

Please click next to receive the completion code. (6FBAB83E)

Appendix D
Main Study Daily Survey
Daily Questionnaire

Thank you for your continued participation in the study: Menstrual cycle's effects on work behaviours.

Here is your daily study. Please answer honestly.

1. **What is your Prolific ID?**

2. **Are you currently experiencing bleeding as part of your period or have you experienced bleeding as part of your period in the past week?**
- Yes
- No

[if yes]

a) **How would you describe your period bleeding today?**
   a. Heavy
   b. Medium
   c. Light
   d. None

b) **When did you first experience menstrual bleeding?**

3. **What day of your cycle are you on? (1 being the first day of menstrual bleeding)**

_____

Premenstrual Symptoms Screening Tool (PSST; Steiner, MacDougall & Brown, 2003)

In the last 24 hours did you experience any of the following?

	Not at all	Mild	Moderate	Severe
Anger/irritability				
Anxiety/tension				
Tearful/increased sensitivity to rejection				
Depressed mood/hopelessness				
Decreased interest in work activities				
Decreased interest in home activities				
Decreased interest in social activities				
Difficulty in concentrating				
Fatigue/lack of energy				
Overeating/food cravings				
Insomnia				
Hypersomnia (needing more sleep)				

4. **Please select if you are experiencing any of the following symptoms related to your menstrual cycle**
   a. Faintness (lightheaded or dizzy)

i. Severe
ii. Moderate
iii. Mild
iv. None

b. Headaches
i. Severe
ii. Moderate
iii. Mild
iv. None

c. Lower Back Pain
i. Severe
ii. Moderate
iii. Mild
iv. None

d. Mood (in the last 24 hours)
i. Low
ii. Ok
iii. Good

e. Motivation (in the last 24 hours)
i. None
ii. Low
iii. Ok
iv. Great

f. Stress (in the last 24 hours)
i. None
ii. Low
iii. Ok
iv. Great

g. Uterine Cramps
i. Severe
ii. Moderate
iii. Mild
iv. None

h. Water Retention (fluid redistribution)
i. None
ii. Low
iii. Ok
iv. Great

5. **How much *overall* pain are you in right now? (Christian, Eisenkraft, Kapadia, 2015)**
   a. no pain
   b. mild pain
   c. moderate pain
   d. severe pain
   e. excruciating pain
6. **Did you take pain medication today?**
   a. Yes
   b. No
7. **Did you work today? This could be all day or for a few hours.**

- Yes
- No

[if yes]

a. [if yes] How many hours did you work today?

_____

b. [if no] were you suppose to attend work today?

8. **How many hours did you sleep last night?**

9. **How would you evaluate the quality of your sleep?**
   a. 1= very poor
   b. 2= poor
   c. 3= good
   d. 4= very good

[if participated worked today]

Based on how you are feeling today, please respond to the following statements.

5-point Likert: 1= strongly disagree; 5= strongly agree

Construct	Item	Reference
37. Job satisfaction	I feel good about my job	MacDonald & MacIntyre, 1997 (Generic Job Satisfaction Scale) (.77)
38. Job satisfaction	I get along with my supervisors	MacDonald & MacIntyre, 1997 (Generic Job Satisfaction Scale) (.46)
39. Job satisfaction	I receive recognition for a job well done	MacDonald & MacIntyre, 1997 (Generic Job Satisfaction Scale) (.70)
40. Job satisfaction	I feel close to the people I work with	MacDonald & MacIntyre, 1997 (Generic Job Satisfaction Scale) (.57)
41. Job satisfaction	I feel good about working at this company	MacDonald & MacIntyre, 1997 (Generic Job Satisfaction Scale) (.64)
42. Job satisfaction	I believe management is concerned about me	MacDonald & MacIntyre, 1997 (Generic Job Satisfaction Scale) (.59)
43. Job satisfaction	On the whole, I believe work is good for my physical health	MacDonald & MacIntyre, 1997 (Generic Job Satisfaction Scale) (.52)
44. Stress	I feel stressed right	Littman, White, Sitia, Bowen, & Kristal, 2006 (Single item measure)
45. Fatigue	I feel fatigued	Van Hooff, Geurts, Kompier, & Taris, 2007. Single item
46. Self-control	I feel drained	Christian & Ellis, 2011 (Self-Control Capacity Scale)
47. Self-control	My mind has felt unfocused	Christian & Ellis, 2011 (Self-Control Capacity Scale)
48. Self-control	It took a lot of effort for me to concentrate on something	Christian & Ellis, 2011 (Self-Control Capacity Scale)
49. Self-control	My mental energy is running low	Christian & Ellis, 2011 (Self-Control Capacity Scale)

50. Self-control	I felt like my willpower was gone	Christian & Ellis, 2011 (Self-Control Capacity Scale)
51. Self-esteem	I have high self-esteem	Robins, Hendin, Trzseniewski, 2001
52. Presenteeism	I was able to finish hard tasks in my work	Koopman et al., 2002 (Stanford Presenteeism Scale) (.88)
53. Presenteeism	I was able to focus on achieve my goals	Koopman et al., 2002 (Stanford Presenteeism Scale) (.86)
54. Presenteeism	The stresses of my job were much harder to handle today	Koopman et al., 2002 (Stanford Presenteeism Scale) (.87)
55. Work withdrawal	Thoughts of being absent	Lehman & Simpson, 1992 (Psychological Withdrawal Behaviours) (.75)
56. Work withdrawal	Left doing your work duties for unnecessary reasons	Lehman & Simpson, 1992 (Psychological Withdrawal Behaviours) (.72)
57. Work withdrawal	Put less effort into the job than you should have	Lehman & Simpson, 1992 (Psychological Withdrawal Behaviours) (.66)
58. Work withdrawal	Thought about leaving current job	Lehman & Simpson, 1992 (Psychological Withdrawal Behaviours) (.62)
59. Work withdrawal	I daydreamed	Lehman & Simpson, 1992 (Psychological Withdrawal Behaviours) (.72)
60. Positive affect	I feel enthusiastic	Watson, Clark, & Tellegen, 1998 (PANAS) (.75)
61. Positive affect	I feel alert	Watson, Clark, & Tellegen, 1998 (PANAS) (.63)
62. Negative affect	I feel distressed	Watson, Clark, & Tellegen, 1998 (PANAS) (.67)
63. Negative affect	I feel irritable	Watson, Clark, & Tellegen, 1998 (PANAS) (.55)
64. Happiness	I feel happy	Abdel-Khalek, 2006 (Single item happiness)
65. Daily task performance	I adequately completed assigned duties	Williams & Anderson (1991) (.83)
66. Daily task performance	I performed the tasks that were expected of me	Williams & Anderson (1991) (.87)
67. POS	My organization cares about my well-being	Eisenberger et al., (2001) (.80)
68. POS	My organization takes pride in my accomplishments	Eisenberger et al., (2001) (.79)

69. Social Support	My coworkers really care about me	Ducharme et al., (2000) (.81)
70. Social Support	I feel appreciated by my co-workers	Ducharme et al., (2000) (.71)
71. Social Support	My coworkers would fill in for me if I were absent	Ducharme et al., (2000) (.78)
72. Social Support	My coworkers give useful advice on job problems	Ducharme et al., (2000) (.62)
73. OCB	I lent a compassionate ear when someone had a personal or work problem	Fox, Spector, Goh, Bruuresma, & Kessler (2012); Johnson, Lanaj, & Barnes (2014)
74. OCB	I gave a co-worker engagement or appreciation	Fox, Spector, Goh, Bruuresma, & Kessler (2012); Johnson, Lanaj, & Barnes (2014)
75. OCB	I took time to advise, coach, or mentor a co-worker	Fox, Spector, Goh, Bruuresma, & Kessler (2012); Johnson, Lanaj, & Barnes (2014)
76. OCB	I offered suggestions to improve how work is done	Fox, Spector, Goh, Bruuresma, & Kessler (2012); Johnson, Lanaj, & Barnes (2014)
77. Emotional Regulation	I am in control of my own emotions	Pekaar, Bakker, van der Linden, & Born (2018); Pekkar, Bakker, van der Linden, Born, & Siren (2018) (.73)
78. Emotional Regulation	I can suppress my emotions easily	Pekaar, Bakker, van der Linden, & Born (2018); Pekkar, Bakker, van der Linden, Born, & Siren (2018) (.73)
79. Emotional Regulation	I do not let my emotions take over	Pekaar, Bakker, van der Linden, & Born (2018); Pekkar, Bakker, van der Linden, Born, & Siren (2018) (.72)
80. Emotional Regulation	I only show my emotions when it is appropriate	Pekaar, Bakker, van der Linden, & Born (2018); Pekkar, Bakker, van der Linden, Born, & Siren (2018) (.68)

[if participant did not work today]

Construct	**Item**	**Reference**
14. Stress	I feel stressed right now	Littman, White, Sitia, Bowen, & Kristal, 2006 (Single item measure)
15. Fatigue	I feel fatigued	Van Hooff, Geurts, Kompier, & Taris, 2007. Single item
16. Self-control	I feel drained	Christian & Ellis, 2011 (Self-Control Capacity Scale)

17. Self-control	My mind has felt unfocused	Christian & Ellis, 2011 (Self-Control Capacity Scale)
18. Self-control	It took a lot of effort for me to concentrate on something	Christian & Ellis, 2011 (Self-Control Capacity Scale)
19. Self-control	My mental energy is running low	Christian & Ellis, 2011 (Self-Control Capacity Scale)
20. Self-control	I felt like my willpower was gone	Christian & Ellis, 2011 (Self-Control Capacity Scale)
21. Self-esteem	I have high self-esteem	Robins, Hendin, Trzseniewski, 2001
22. Positive affect	I feel enthusiastic	Watson, Clark, & Tellegen, 1998 (PANAS) (.75)
23. Positive affect	I feel alert	Watson, Clark, & Tellegen, 1998 (PANAS) (.63)
24. Negative affect	I feel distressed	Watson, Clark, & Tellegen, 1998 (PANAS) (.67)
25. Negative affect	I feel irritable	Watson, Clark, & Tellegen, 1998 (PANAS) (.55)
26. Happiness	I feel happy	Abdel-Khalek, 2006 (Single item happiness)
27. Emotional Regulation	I am in control of my own emotions	Pekaar, Bakker, van der Linden, & Born (2018); Pekkar, Bakker, van der Linden, Born, & Siren (2018) (.73)
28. Emotional Regulation	I can suppress my emotions easily	Pekaar, Bakker, van der Linden, & Born (2018); Pekkar, Bakker, van der Linden, Born, & Siren (2018) (.73)
29. Emotional Regulation	I do not let my emotions take over	Pekaar, Bakker, van der Linden, & Born (2018); Pekkar, Bakker, van der Linden, Born, & Siren (2018) (.72)
30. Emotional Regulation	I only show my emotions when it is appropriate	Pekaar, Bakker, van der Linden, & Born (2018); Pekkar, Bakker, van der Linden, Born, & Siren (2018) (.68)

Table 1. Summary of Hormonal Changes and Bodily Changes in the Menstrual Cycle

Phase	Timing	Hormonal Change	Effects on the Body
Menstruation	1-7 days	Low levels of estrogen and progesterone	Variety of symptoms including cramps, bloating, muscle aches, low energy
Follicular	8-13 days	Rise in estrogen levels. Continued low levels of progesterone.	Energized, happy
Ovulation	14-15 days	Drop in estrogen levels. Rise in progesterone levels.	Similar effects as follicular phase
Mid-luteal	16-24 days	Rise in estrogen levels. Continued rise in progesterone levels.	Lower energy than follicular phase
Post-luteal (pre-menstrual)	24-29 days	Drop in both estrogen and progesterone levels.	Very low energy. PMS symptoms begin to set in like mood swings, headaches, cramps, and bloating.

Note. "Timing" refers to the typical days after menstrual bleeding first begins

Table 2. Variance Decomposition for Within-Person Variables

Construct	Within-individual variance (σ^2)	Between-individual variance (τ_{00})	% of within-individual variance
Job Satisfaction	0.34	0.17	66.39%
Negative Affect	0.09	0.25	26.02%
Positive Affect	0.49	0.37	56.48%
Self-Control	0.39	0.75	33.89%
Work Withdrawal	0.31	0.31	50.15%

Note. % of total variance that is within-person was computed using the formula $\sigma^2/(\sigma^2 + \tau_{00})$

Table 3. Descriptive Statistics N = 2650

	Mean	SD	Alpha	1	2	3	4	5
1. Menstrual Phase				-				
2. Job Satisfaction	3.24	.717	.859	-.090**	-			
3. Work Withdrawal	2.44	.783	.704	.074**	-.440**	-		
4. Self-Control	3.22	1.06	.931	-.155**	.384**	-.643**	-	
5. Negative Affect	1.41	.588	.810	.106**	-.308**	.247**	-425**	-
6. Birth Control Usage	.406	.491	-	.004	.045	-.091**	.015	-.020

Notes.
*. Correlation is significant at the 0.05 level (two-tailed).
** Correlation is significant at the 0.01 level (two-tailed
Measures 1-5 are within -person; measures 6 are between-person

Table 4. Multilevel Analysis Menstruation Phase, Self-Control, Work Withdrawal

	Self-Control	Work Withdrawal	
Main Effects Within	Model 1	Model 2	
Menstrual Phase	-.374**	-.014	
Self-Control	-	-.446**	
Indirect Effects (Within)	Estimate	LLCI	UCLI
Work Withdrawal (via Self-Control)	.167**	.132	.202

N= 2650
LLCI = lower level of the 95% confidence interval. UCLI = upper level of the 95% confidence interval.
Unstandardized estimates are reported.
* $p < .05$, two-tailed
** $p < .01$, two-tailed

Table 5. Multilevel Analysis Menstruation Phase, Negative Affect, Job Satisfaction

	Negative Affect	Job Satisfaction	
Main Effects Within	Model 1	Model 2	
Menstrual Phase	.140**	-.051*	
Negative Affect	-	-.336**	
Indirect Effects (Within)	Estimate	LLCI	UCLI
Job Satisfaction (via Negative Affect)	-.047**	-.064	-.030

N= 2650
LLCI = lower level of the 95% confidence interval. UCLI = upper level of the 95% confidence interval.
Unstandardized estimates are reported.
**p <.01, two-tailed

Figure 1. Country Location of Participants

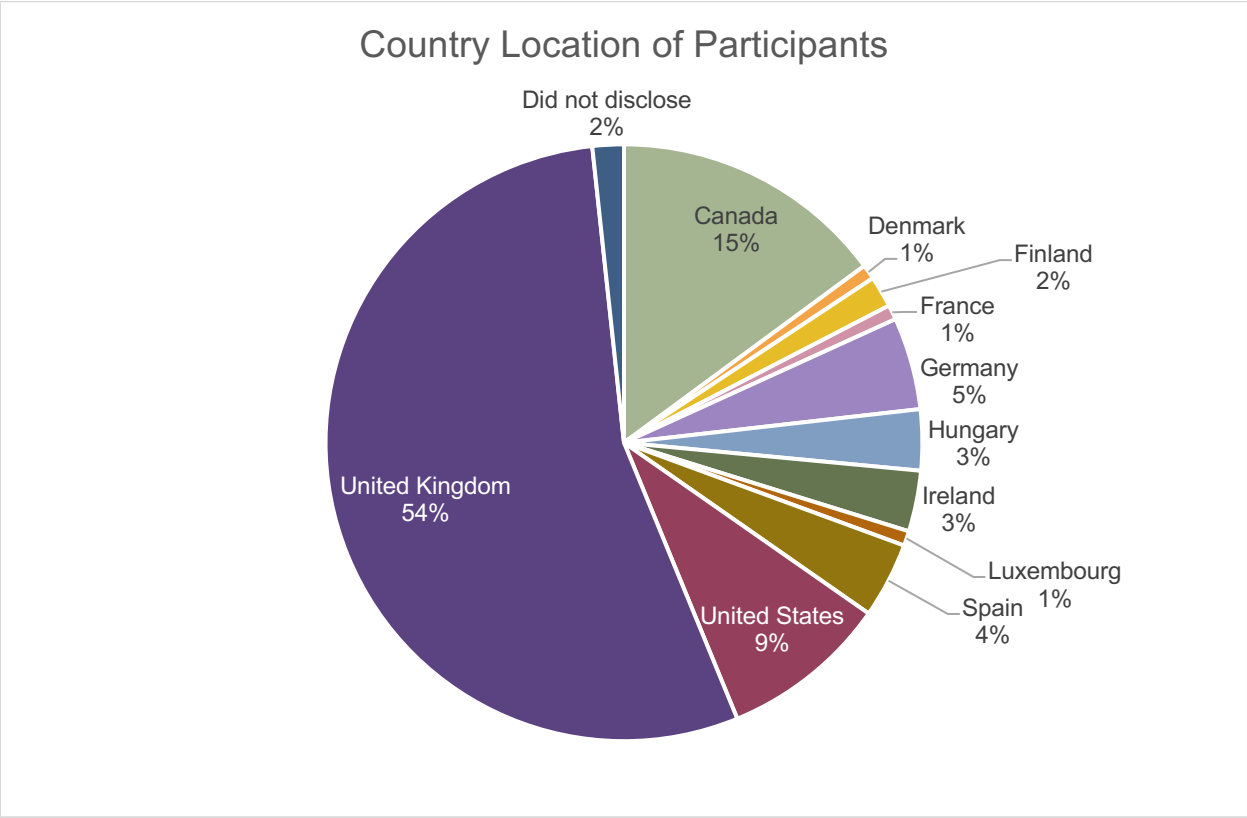
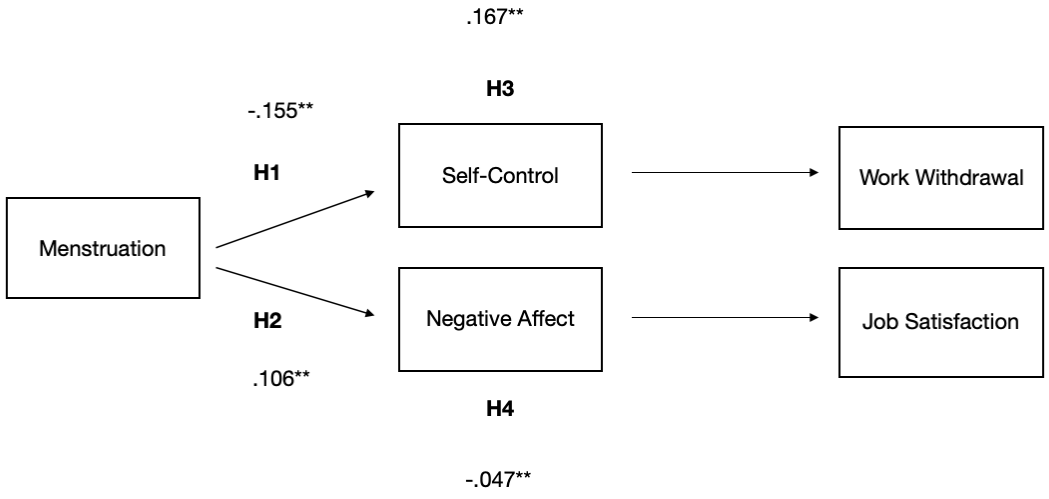


Figure 2. Visual Summary of Hypotheses



Note. H= Hypothesis for brevity. Pearson's correlation coefficient are reported for Hypothesis 1 and 2. For full correlation table see Table 3. For complete multilevel path analysis results, see Table 4 and 5.

* $p < .05$
** $p < .01$