DISTRIBUTIVE JUSTICE AND THE THREE M'S: HOW MENSTRUATION, MATERNITY, AND MENOPAUSE PROVIDE CRITICAL INSIGHT INTO EQUITY-, EQUALITY-, AND NEEDS-BASED DISTRIBUTIVE JUSTICE PERCEPTIONS

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ABSTRACT

This dissertation explores how menstruation, maternity, and menopause shape distributive justice perceptions within organizational settings. Traditional research on distributive justice has predominantly emphasized the equity principle and neglects the equally important principles of equality and need. By integrating the unique and evolving needs associated with women's reproductive phases, this study broadens the theoretical and empirical understanding of distributive justice. The theoretical framework in Chapter 3 posits that the physiological and psychological experiences associated with menstruation, maternity, and menopause create a context of uncertainty that reveal critical insights into how needs-based resources shape perceptions of distributive justice. Then in Chapter 4, the empirical studies use a quasi-experimental longitudinal field study and experimental design to investigate how uncertainty associated with menstruation impacts employees' distributive justice perceptions when organizations provide needs-based resources. Together, my theorizing and empirical results indicate that needs-based resources influence needs- and equality-based distributive justice perceptions more than equity-based distributive justice perceptions, and the results underscore the inadequacy of equity-focused distributive justice measures in capture the full spectrum of distributive justice perceptions.

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CHAPTER ONE – INTRODUCTION

Consider the experience of an ICU nurse, Leigh. When Leigh first enters the nursing profession, she is in her mid-20's and is adjusting to her new work schedule – 12-hour shifts, sometimes overnight, filled with patients, charting, and few opportunities to take a break due to high caseloads. A decade later, Leigh remains in the nursing profession, but over the last 10 years has received a specialized nursing degree and now works as a certified nurse anesthetist (CRNA). Her position comes with more prestige and slightly more autonomy, but she still works grueling 12-hour shifts that come with few breaks and little private space for those breaks. After 20 years as a CRNA, Leigh receives a promotion to head CRNA, where she manages case and nurse scheduling. The position comes with pressure to demonstrate her ability to manage the whole department. This career progression can be typical for nurses. However, Leigh also experiences other typical changes across her career progression that align with changes in her reproductive phase. Over the course of a woman's working lifespan, they experience menstruation, maternity, and menopause due to healthy changes in hormones and fertility. These experiences are often intertwined with their career and work experiences (Grandey et al., 2020). Applying this idea to the previous anecdote, Leigh's career progression can be viewed with a new lens incorporating her progression through menstruation, maternity, and menopause.

For example, in Leigh's first position as an ICU nurse, those difficult to find breaks mean it is more difficult for her to find time to manage her menstruation. Her period is particularly heavy in the early days of her menstrual cycle, and her hospital requires her to wear light green scrubs that do not hide leaks or stains. Shortly after Leigh is promoted to CRNA, she decides to have children now that she has a bit more stability in her career. Unlike other occupations, where women can usually wait a few months to disclose pregnancy, Leigh must disclose immediately

after discovering the news for herself because certain tasks relevant to her position (e.g., X-rays) are dangerous to her growing baby. When she returns to work, she has difficulty finding time and private space to breastfeed in the bustling hospital. Finally, when Leigh becomes Chief CRNA thirty years into her career, she experiences an unexpected hot flash during a difficult scheduling conversation with a subordinate but attempts to keep the conversation going as if nothing is wrong. Without a fan accessible, she worries she's going to sweat through her scrubs.

All of Leigh's reproductive experiences, while personal, are also complexly intertwined with her work experiences, and organizations have recently stepped up to the challenge to provide further support for menstruating, maternal, and menopausal employees like Leigh in the anecdote (Witten, 2023). For example, to support menstruating employees like Leigh, the hospital could offer a darker option for scrubs so any leaks or stains are less visible. To support nurses in maternity, the hospital could provide supported breaks for lactation and a designated lactation room with access limited to only breastfeeding employees. To support employees in menopause, the hospital could provide the nurses with personal fans or a cold break room to cool down in when hot flashes arise. These changes are examples of distributive resources allocated according to the needs of menstrual, maternal, and menopausal employees. Distributive justice refers to these resources as needs-based resources because the resources are allocated according to individual or group need (Deutsch, 1975).

Needs-based resources are distributed according to need, which is one of three principles used to guide allocations and perceptions of distributive justice (Deutsch, 1975). Distributive justice comes into play when the organization provides conditions or goods distributed to support individual well-being (Deutsch, 1975). Early justice theory argued that distributive justice is comprised of three principles based on equity, equality, and need. However, current mainstream

justice research predominantly relies on one measure of distributive justice (Colquitt, 2001), and this measure only reflects the equity principle of the original theory. Even though distributive justice research has proliferated in the last few decades, the research to date presents a narrow understanding of distributive justice that ignores equality and needs principles in distributive justice (Rupp et al., 2017).

One reason researchers hesitate to study the needs principle in distributive justice is because needs are often individualized and fluctuate in salience according to context (Bierhoff et al., 1986). However, female employees' needs also change throughout their lives according to their reproductive phase, so understanding the effect of needs-based resources on menstrual, maternal, and menopausal employees provides a unique opportunity for broadening our current understanding and empirical approach to distributive justice. As such, this dissertation leverages best practices and understanding derived from menstruation, maternity, and menopause research to dive into the complexity of the needs principle of distributive justice (Leventhal, 1980).

The goal of this dissertation is to provide better understanding of how the need, equity, and equality principles of distributive justice work together when organizations provide resources according to employee needs. As such, I investigate the effect of providing needs-based resources on menstrual, maternal, and menopausal employees' perceptions of distributive justice according to need, equity, and equality (Deutsch, 1975). I use early justice theory to explain why needs-based resources should elicit stronger needs-based distributive justice perceptions compared to equity- and equality-based distributive justice perceptions (Leventhal, 1976), and then evoke fairness heuristic theory and theory of uncertainty management (Lind & Van den Bos, 2002; van den Bos & Lind, 2002) to argue that menstruation, maternity, and menopause create a context of uncertainty that strengthens the impact of needs-based resources

on distributive justice perceptions. While this uncertainty context is an individual pivot point that influences the fairness heuristic process, I also argue that how resources are communicated is an organization-level pivot point that further enhances the fairness heuristic process. Thus, this dissertation provides an expansion of distributive justice using the fairness heuristic model as well as individual and organizational contingency factors.

Across a theory section and two studies, I argue and demonstrate that the uncertainty associated with menstruation, maternity, and menopause at work creates a context that increases the salience of needs-based resources and increases the positive distributive justice judgments associated with them. The theory section demonstrates that understanding needs-based resources and needs-based distributive justice effects goes hand in hand with studying menstruation, maternity, and menopause at work. Then, the first study uses a quasi-experimental longitudinal field study design. I measured participants' distributive justice perceptions based on equity, equality, and need across multiple menstrual cycles before and after the organization provided menstruation resources, and the results from this study indicate that employees' needs- and equality-based distributive justice perceptions increase when menstruation resources are provided and that this increase is stronger when women have menstruation uncertainty. The second study uses an experimental design to explore the media richness effects of needs-based resource messaging to determine if media richness of the message increases distributive justice perceptions (Daft & Lengel, 1986).

This dissertation has contributions to distributive justice research and research on women's health at work. First, this study contributes to research on women's health at work because the theory chapter provides a broad theoretical lens that unites menstruation, maternity, and menopause. This is an important first step in building theoretical consensus in work and

women's health research because the current research uses a segmented approach to theory that silos each of these reproductive experiences. This dissertation is the first in the area to apply an uncertainty management framework to women's physical health experiences in the workplace (Lind & van den Bos, 2002), yet unique uncertainties characterize menstruation, maternity, and menopause at work in comparison to non-reproductive uncertainties at work. For example, maternity is characterized by uncertainty regarding pregnancy disclosure (King & Botsford, 2009) or ability to satisfy lactation needs at work (Gabriel et al., 2020), and menopause is characterized by uncertainty regarding symptom management (De Salis et al., 2018). Thus, this study speaks to the uncertainty created by women's health experiences across the working lifetime. Additionally, this study bridges the gap between women's health and distributive justice because the fluctuation in needs female employees experience according to menstruation, maternity, and menopause requires a broader approach to distributive justice.

This study responds to the warning that current distributive justice research is too limited (Cropanzano et al., 2001; Grandey, 2001; Rupp et al., 2017) and provides initial evidence that a broader, more comprehensive definition is required in some research contexts. I argue and the results show that some resource distributions target individuals' values for need and equality more than they target equity. I use the results from these studies to begin building a broader foundation for distributive justice theory (Deutsch, 1975). Re-building distributive justice theory requires more research that simultaneously incorporates the multiple allocation principles of distributive justice, and this dissertation demonstrates that there may be a much bigger picture to distributive justice than we currently have.

I also provide evidence that our current approach to distributive justice research would be strengthened by aligning the norm used in distributed resource allocation with the appropriate

facet of distributive justice and suggest distributive justice researchers should practice allocation-perception alignment. For example, organization-provided menstruation resources are a clear example of distributive justice – a condition or good distributed to support individual well-being (Deutsch, 1975; Leventhal, 1976). Yet equity does not adequately capture the fairness perceptions associated with needs-based resources because the resources are not distributed according to input (Adams, 1965). Thus, I demonstrate that alignment between resource allocations and perceptions is critical to expanding distributive justice theory and research, and I describe how past research has suffered from allocation-perception misalignment.

The above introduction provides a short review of this dissertation's contributions, and they are discussed further in Chapter Five, the conclusion. The rest of this manuscript is organized as follows. In Chapter Two, I provide a literature review of the Three M's – menstruation, maternity, and menopause (Grandey et al., 2020). I also review distributive justice theory and the three principles of distributive justice – equity, equality, and need (Deutsch, 1975; Leventhal, 1976). From there, Chapter Three develops the theory and propositions for menstrual, maternal, and menopausal employees. In Chapter Four, I provide an empirical test of the theoretical model among menstruating employees. Finally, Chapter Five concludes with a discussion of theoretical and practical implications, as well as limitations and directions for future research.

CHAPTER TWO – LITERATURE REVIEW

The Three M's – Menstruation, Maternity, and Menopause

In the section below, I review menstruation, maternity, and menopause. For each reproductive phase, I provide a biological definition of that phase, the physiological and psychological symptoms associated with that phase, and I describe the work experiences of employees in that phase. I conclude each reproductive phase section with a description of the resources that organizations can provide to support employees in each reproductive phase.

Menstruation.

Menstruating women are those that have experienced menarche – their first period – but are not pregnant or menopausal (Grandey et al., 2020). Menstruation is a near-monthly period the body goes through to prepare for pregnancy, during which the uterus shreds its lining; it usually begins between ages 11 and 14 and ends when a woman reaches menopause (NIH, 2017). The menstrual cycle begins with the first day of the period (day 1) and ends with the first day of the next period (Office on Women's Health, 2021). To clarify, menstruation refers to the reproductive phase menstruation as well as the period of the menstrual cycle during which women are bleeding. If I am discussing the effects of menstruating (versus not menstruating), I reference a comparison to not menstruating in parentheses to indicate when employees have menstrual bleeding and when they do not.

Cycles are usually divided into two distinct phases – follicular and luteal – that are defined by fluctuating estradiol (estrogen) and progesterone levels (Beltz & Moser, 2020). The follicular phase begins on the first day of period onset (day 1) and lasts until day 16 on average (Bull et al., 2019). It is characterized by low progesterone and initially low but rising levels of estrogen (Beltz & Moser, 2020). Ovulation is the time during which an egg can be fertilized

(Office on Women's Health, 2021). In many women, ovulation usually occurs between days 12 and 14 at the end of the follicular phase, but it can occur anywhere between day 10 and 21 (NIH, 2017). The timing of ovulation, and thus the length of the follicular phase, are both more variable than the length of luteal phase, which stays relatively stable between women (Cole et al., 2009). The luteal phase begins after ovulation (and thus the follicular phase) ends and lasts 12 days on average (Bull et al., 2019). The length of luteal phase does not vary greatly between women (Hampson, 2020). It is characterized by a second peak and quick decrease in estrogen (Beltz & Moser, 2020). Progesterone peaks midway through the luteal phase, and then drops off to low levels with estrogen in the latter part of the luteal phase (Beltz & Moser, 2020). Thus, among naturally cycling women, the follicular phase is usually characterized by a rise in estrogen, while the luteal phase is usually characterized by a rise in progesterone (Hampson, 2020).

Menstruation also varies between and within women. First, there is a between-women difference between those that use hormonal contraceptives and those that do not. The hormone variation described in the paragraph above describes hormone fluctuation across naturally cycling women, or women who do not use hormonal contraceptives. Hormonal contraceptives are a pill, intrauterine device (IUD), or injection that regulates hormone levels across the menstrual cycle and suppresses ovulation (Hampson, 2020). In opposition to the cyclical variation described in the paragraph above, hormonal contraceptive users' estrogen and progesterone are more stable and exhibit a more predictable variation in hormones because contraceptives depress ovulation (and therefore pregnancy) (Hampson, 2020). Women using hormonal contraceptives also experience little fluctuation in cycle length, with most users' cycles lasting 28 days (Hampson, 2020). Among naturally cycling women, average cycle length varies from month to month, with the average spanning 21-35 days (NIH, 2017). Thus, there are

between-person differences in menstruation according to contraceptive use. Additionally, among naturally cycling women, the follicular phase length varies between and within women (from cycle to cycle) as well (NIH, 2017). Thus, menstruation experiences differ between women and from cycle to cycle within women.

Symptoms and symptom severity vary from menstrual cycle to menstrual cycle within women (Schoep et al., 2019) and between women (Bull et al., 2019; Motro et al., 2019). The menstrual experience includes physical symptoms like headaches, joint and muscle pain, reduced energy, food cravings, and fatigue among women ages 18-37 and lasts an average of 5 days but ranges from 1-14 days (Hantsoo, Sajid, et al., 2022; Hardy & Hunter, 2021). A common symptom includes dysmenorrhea, or "painful cramps of the uterine origin" just before and/or during menstruation onset (Bernardi et al., 2017, p. 3). 85% of women report experiencing menstrual pain that coincides with their period, with 43% indicating they experience this level of pain during every period, though women using hormonal contraceptives are less likely to report menstrual pain (Grandi et al., 2012). Because these symptoms vary from cycle to cycle, this could mean that an employee experiences severe menstrual cramps during one period but not the next. Between women, some women are more prone to menstrual cramps than others, so the severity of these physical symptoms varies between women as well.

Menstruation also has psychological effects. Before and during menstruation, menstruators experience irritability, mood swings, and anxiety (Hardy & Hunter, 2021). Recurring menstrual pain is related to reduced quality of life, reduced sleep quality, and poorer mood (Bernardi et al., 2017). Further, women with moderate and severe menstrual symptoms are likely to experience depression, anxiety, and have lower psychological resiliency compared to those with mild or no menstrual symptoms (Hardy & Hunter, 2021). Depressive symptoms may

occur due to fluctuation in estrogen, a normal part of the menstrual cycle (Payne, 2003). This means feelings like sadness increase in the week leading up to menstruation, with peak sadness usually occurring on the day of menstruation onset (Pierson et al., 2021). Importantly, menstrual cycles account for greater variance in mood and behavior changes compared to seasonal or weekly cycles (Pierson et al., 2021). These physical and psychological symptoms demonstrate that menstruation impacts menstruating employees' health and well-being.

These physical and psychological effects influence menstruating employees' work experiences as well, especially productivity. For example, some women report that their menstrual cycle negatively impacts concentration, efficiency, energy levels, and level of interest in their own work (Ponzo et al., 2022). Many women also report they experience productivity loss due to menstrual pain (Tanaka et al., 2013). Women who miss work and report productivity losses due to their menstrual cycle cite cramps, fatigue, and bloating as their most frequent symptoms (Ponzo et al., 2022). Women with menstrual problems have significantly more illness-related work absences than other women (Herrmann & Rockoff, 2013), with 13% of women missing an average of 1.3 days per year due to menstruation-related symptoms (Schoep et al., 2019). Women with severe menstrual symptoms are five times more likely to be absent from work, six times more likely to leave early, and 12 times more likely to get to work late (Hardy & Hunter, 2021). On the flip side of absenteeism, menstruating women also engage in presenteeism, coming to work even though they are ill (Johns, 2010). On average, menstruating women report losing about nine days of productivity a year due to presenteeism (Schoep et al., 2019), which occurs more frequently among women with mild symptoms than those with severe symptoms (Hardy & Hunter, 2021). Thus, multiples symptoms associated with menstruation affect important work outcomes like productivity.

Organizations have many options for providing resources to support menstruating employees. Menstruation is stigmatized because menstruation and its associated symptoms (e.g., bleeding) are often considered to be "gross" or "disgusting" despite the fact that it is a signal of health and well-being (Stubbs & Costos, 2004), which may lead others to want to avoid menstruating women or to avoid discussing menstruation (Roberts et al., 2002). Because menstruation is stigmatized (Chrisler, 2011; Roberts, 2004), organizations can provide resources that destigmatize menstruation and demonstrate understanding, acceptance, empathy and lack of judgement; organizations can treat menstruation like any other health condition or natural bodily function (Hardy & Hunter, 2021). Organizations that create an open and transparent culture regarding menstruation (Gibbons, 2023) may be able to facilitate smoother conversations regarding menstrual needs between supervisors and employees (Johnston-Robledo & Chrisler, 2013). Additionally, organizations can provide free menstrual products in employee restrooms just as they provide toilet paper and soap (Hardy & Hunter, 2021). Organizations also provide menstruation resources if they offer employees a dark uniform option that hides menstruation leaks or stains (HOPE, 2023) as well as time and discretion for bathroom breaks during menstruation (Gibbons, 2023). Further, one study found that 68% of women sampled indicated a desire for greater flexibility in tasks and working hours to help them manage menstruation and menstrual pain (Schoep et al., 2019). Organizational policies that offer women the opportunity to work from home or take the day off due to menstrual symptoms are beneficial (Levitt & Barnack-Tavlaris, 2020; Price, 2021). In sum, there are many avenues organizations can and do use to support the needs of menstruating employees.

Maternity.

The maternity phase includes the "prenatal stage (pregnancy), when menstruation ceases, and postnatal state (lactation), during which menstruation resumes" (Grandey et al., 2020: 14). The average age of giving birth for the first time among US women is 27 years old, though the average spans from 26-32 years (UNECE, 2023), with birth rates among older women increasing over the last 30 years (Morse, 2022). Women of a maternal age are often attributed with a "maternal" identity socially due to the belief that they could potentially have a child in the future (Gloor et al., 2018), but some women choose not to experience maternity due to reproductive choice or reproductive issues such as infertility and miscarriage (Mainiero & Sullivan, 2005). Thus, even though maternity may not result in birth, the maternity phase encompasses women who are of maternal age, experience miscarriage, the "spontaneous loss of a previously viable pregnancy," and those who experience pregnancy termination, defined as "a medical procedure meant to terminate pregnancy through either medicine or surgery" (Arena et al., 2023, p. 58). It also includes women dealing with fertility procedures, such as egg-freezing (Flynn & Leslie, 2022).

Before discussing the physiological and psychological symptoms associated with maternity below, I want to note that maternity and menstruation phases can and often do overlap for female employees (Grandey et al., 2020). For example, an employee that has children but is not pregnant spans both menstruation and maternity because they are a parent but not pregnant, and menstruating. Though the section below discusses experiences associated with maternity, it is possible and likely that some of the experiences and symptoms described below overlap with those described in menstruation.

First, pregnancy and breastfeeding are associated with physical symptoms that may impact work outcomes. Many women in pregnancy often experience nausea or vomiting, fatigue, and cramping (Mayo Clinic, 2021). These experiences can lead to presenteeism or absenteeism (Gatrell, 2011). Additionally, pregnant women experience absenteeism because the frequency of appointments required for prenatal care causes women to pregnant women to miss work with increasing frequency as pregnancy continues and health concerns become increasingly salient (Ladge et al., 2012; Little et al., 2015; Medicine, 2016). Upon returning to work, many employees have a desire to continue breastfeeding and lactating (Schmied et al., 2011; Weber et al., 2011), which can be difficult to accomplish at work (Gabriel et al., 2020).

There are many policies and procedures organizations can use that provide resources for employees in maternity. For example, pregnant women often face the difficult decision of when to disclose their pregnancy to coworkers because pregnant working women face pregnancy discrimination (Paustian-Underdahl et al., 2024), stereotypes that they have low competence (Pownall et al., 2023), and lower performance evaluations (Halpert et al., 1993). These potential biases create a state of uncertainty for women in maternity. However, organizations can take steps to support pregnancy disclosure among employees; clarity and number of family friendly policies is posited to be negatively related to delay in pregnancy disclosure (King & Botsford, 2009). Thus, organizations with family friendly policies signal to employees that pregnancy disclosure is welcome, which should also reduce uncertainty as it relates to pregnancy and work. Indeed, supportive work-family cultures and supervisor support are related to reduced concealing and increased revealing behaviors (Jones et al., 2016). Organizations also provide resources for breastfeeding employees such as lactation breaks (Spitzmueller et al., 2016) and lactation facilities or space (Thomas et al., 2022). Some organizations offer employees financial support

for egg freezing (Flynn & Leslie, 2022), which offers employees more control over their family planning decisions. In sum, organizations have many avenues to provide organizational resources for employees in maternity.

Menopause.

Menopause typically occurs between the ages of 45 and 55 (NIH, 2018). Colloquially, we often use menopause to refer to the menopausal symptoms women experience, but scientifically menopause is broken down into multiple sub-phases consisting of pre-, peri-, and post-menopause. Pre-menopause describes the time before a woman's menstrual cycle changes (NIH, 2018). Perimenopause begins when a woman's menstrual cycle changes in regularity, length, or severity (U.S. Department of Health and Human Services, 2021). Perimenopause ends when a woman stops menstruating for 12 months straight, signifying their transition into post-menopause (NIH, 2018). After menstruation has stopped completely, women remain in post-menopause. Thus, what we often colloquially refer to as "menopause" and the physical symptoms associated with it is scientifically known as perimenopause. During perimenopause, women experience a decrease in estrogen, which is the major driver of their physical changes (Burger et al., 1995). However, I use the broad term menopause below because women experience many of the associated symptoms throughout pre-, peri-, and post-menopause.

Menopausal employees experience physical symptoms that may adversely impact work. Women in peri- and post-menopause typically report feeling sleep disturbances, headaches, and fatigue, while perimenopausal women often report memory loss and hot flashes (Jack et al., 2014). Sleep problems are especially common among perimenopausal women compared to post-menopausal women (Hickey et al., 2017). The struggle to sleep may be related to memory problems or reduced energy (USDHHS, 2021). Additionally, women often experience hot flashes

due to changing estrogen levels (USDHHS, 2021). Hot flashes include flushing, redness of the skin, sweating, or shivering and last 30 seconds to 10 minutes (USDHHS, 2021). Menopausal women who experienced at least 35 hot flashes a week experienced reduced current memory, attention, working memory, and increased frequency of forgetting (Drogos et al., 2013; Maki et al., 2015).

Organizations have many opportunities to support the needs of menopausal employees because the symptoms associated with menopause create an environment of uncertainty at work. The timing, duration, and severity of symptoms like hot flashes are unpredictable (De Salis et al., 2018), so organizations can provide menopausal employees with resources that help them self-manage and respond to their symptoms. For example, organizations can provide menopausal employees with flexible work arrangements or discretion over breaks (Jack et al., 2016). Organizations can also provide employees with methods for cooling their workspace (Hickey et al., 2017), either with a personal fan or control over the thermostat (Griffiths et al., 2013), which reduces the severity of menopause symptoms (Bariola et al., 2017). Organizations can also provide information to supervisors and employees regarding menopause (Jack et al., 2014), which serves to ease the conversation between employees and supervisors and destigmatize menopause (Hickey et al., 2017). Thus, organizations can provide employees and supervisors with resources that help menopausal employees navigate the experience of menopause at work.

In the sections above, I reviewed menstruation, maternity, and menopause, including the physiological and psychological symptoms associated with each and the resources organizations can provide to employees in each reproductive phase. In the section that follows, I review distributive justice and the three principles associated with distributive justice allocations and perceptions – equity, equality, and need. I use this section to demonstrate the necessity for

broader distributive justice research that incorporates all three principles, and then I draw on this review of the literature in the theory section in Chapter Three.

Distributive Justice

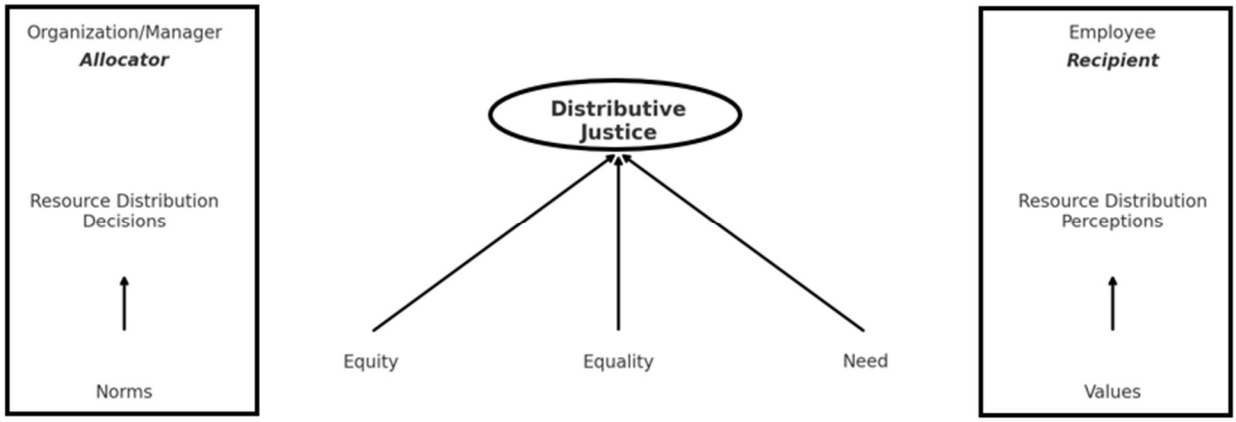
Justice is a motivational phenomenon socially constructed by those in the organization. There are four broad dimensions of organizational justice – distributive, procedural, interpersonal, and informational (Colquitt, 2001). The distributive justice dimension deals with distribution of resources and leads to outcome satisfaction and task perforamnce (Colquitt, 2001; Colquitt et al., 2013; Deutsch, 1975). Procedural justice is the perceived fairness of procedures used to determine outcomes (Folger & Greenberg, 1985) and leads to rule compliance and leader evaluation (Colquitt, 2001). Interpersonal justice is related to how people are treated during execution of procedures or determining outcomes (Bies & Moag, 1986) and engenders positive leader evaluation (Colquitt, 2001). Informational justice relates to perceived adequacy in explanations for procedures or outcomes (Greenberg & Cropanzano, 1993) and leads to collective esteem (Colquitt, 2001). Importantly, each of these organizational justice dimensions are connected to other positive work outcomes, such as organizational commitment, organizational citizenship behaviors, job satisfaction, and organizational trust (Cohen-Charash & Spector, 2001).

However, the four dimensions of organizational justice are conceptually distinct from one another (Colquitt, 2001; Folger, 1977), and this literature review will focus on the distributive justice dimension only because the purpose of this dissertation is to understand how allocators' distribution of resources impacts employee justice perceptions.

Before reviewing each of the distributive justice principles, it is important to define some of the important terminology in distributive justice research. Allocators control the resources and

often make allocation decisions regarding how the resource is distributed (Leventhal, 1976). Allocation decisions are made at the organization level or by supervisor discretion (Daverth et al., 2016). Employees are the recipients of resources (Leventhal, 1976). Thus, the allocator uses distributive justice to make resource distribution decisions, and the recipient evaluates the distribution decisions to form distributive justice perceptions. Figure 1 contains an explanatory figure that clarifies the allocator v. recipient sides of distributive justice. In Figure 1, allocators are represented on the left side of the figure and recipients are represented on the right side of the figure. Distributive justice and its three principles are depicted in the middle because these three principles inform allocators' norms used for distribution decisions on the left and values used to form distributive justice perceptions among employees on the right.

Figure 1. Distributive Justice



Distributive justice principles.

According to Deutsch (1975), distributive justice uses multiple guiding principles, including but not limited to treating all employees according to equity, "so that all receive outcomes proportional to their inputs;" according to equality, "so that they have equal

opportunity without favoritism or discrimination;" and "according to their needs" (Deutsch, 1975, p. 139). In short, the main principles of distributive justice include equity, equality, and need (Deutsch, 1975). These principles are displayed in the middle of Figure 1, and the figure indicates that each of these principles influence employees' distributive justice perceptions and allocators' distributive justice decisions. As the figure suggests, allocators rely on these three principles when making distributive justice decisions, which are referred to as the allocation norms for distributive justice (Leventhal, 1976). On the other side, recipients rely on these three principles to identify the value associated with each resource distribution, which is then reflected in their distributive justice perceptions. I describe each of these principles according to the norms used by allocators during decisions and the values used by recipients while forming perceptions below.

Allocators use the equity norm in allocation decisions when resources are distributed according to recipient contribution (Leventhal, 1976). The input-output model first introduced in Adams' equity theory suggests that resource distribution should be equivalent to employee input (Adams, 1965). Allocators may intentionally use the equity norm if they seek to raise employee productivity because it incentivizes employees to increase their contribution in return for a greater individual outcome (Deutsch, 1975). One example of an equity-based allocation norm is providing annual compensation bonuses according to individual sales over the course of a year because their outcome is commensurate with their input. When individuals form distributive justice perceptions based on the equity principle, they evaluate their distribution ratio (input v. outcome) and then compare this ratio to a referent other, typically other employees in similar roles (Cropanzano et al., 2001). Here, the referent is individual input, so if the outcome is greater

than or equal to their input, individuals' value for equity is satisfied, and individuals' distributive justice perceptions according to equity are positive.

Allocators use the equality norm in allocation decisions when resources are distributed to all employees equally, regardless of their contribution (Gilliland, 1993). Allocators may intentionally use the equality norm if they seek to increase group cooperation and enhance interpersonal relationships (Leventhal, 1976), as well as feelings of mutual esteem between the organization and the individual (Deutsch, 1975). One example of an equality-based allocation norm is providing each employee with the same number of vacation days over the course of a year because the distribution is provided equally. When individuals form distributive justice perceptions based on the equality principle, they compare their outcome to other employees, so other employees' outcomes are the referent. If the outcomes are equal, individuals value for equality is satisfied and distributive justice perceptions according to equality are positive.

Allocators use the needs norm in allocation decisions when resources are distributed according to individuals' needs (Deutsch, 1975), such that those who have greatest need receive the greatest distribution (Leventhal, 1976). Allocators use needs-based norms for resource distribution when supporting individual welfare is the overarching goal (Deutsch, 1975; Leventhal, 1980). One example of a needs-based allocation norm is providing select employees with hybrid work schedules to accommodate family care needs. When individuals form distributive justice perceptions based on the needs principle, they compare their distribution to their own needs. If their needs are met, the value for need satisfaction is met, and individual distributive justice perceptions according to need are positive.

Importantly, these norms are often at odds with each (Deutsch, 1975). For example, a bonus distributed according to annual sales performance, which uses the equity principle, is not

provided to each employee equally, so it violates the equality principle. Needs-based distributions violate the equity principle because they are not provided based on performance, and they may violate the equality principle if they are not provided to all employees (Grandey, 2001). As such, allocators and recipients typically employ a weighted linear combination of all three principles when making distributive justice decisions and forming distributive justice perceptions (Leventhal, 1980). Leventhal (1980) suggests that this rule combination looks like the following equation:

$$DJ = w_c + w_n + w_e$$

In this equation, DJ stands for distributive justice allocation decisions and perceptions, and "w_c, w_n, and w_e represent, respectively, the weights of the contributions rule, needs rule, and equality rule" used to make distribution decisions and form distributive justice perceptions (Leventhal, 1980, p. 8). To clarify, the contributions rule is the equity rule. For allocators, this equation represents how much allocators rely on each norm when making distributive justice decisions. Among recipients, this equation represents each person's full distributive justice perceptions as characterized by the value weight for each principle. In the theory section in Chapter 3, I argue that the value weights for allocators reflects the value weights among recipients because the recipients interpret allocation norms when forming distributive justice perceptions.

Importantly, that these three principles are each weighted to form distributive justice perceptions is important because the majority of distributive justice research to date has only explored the equity principle, which means our current understanding of distributive justice may be limited in its ignorance of the equality and needs principles in the weighted linear combination (Rupp et al., 2017). Research on employees in menstruation, maternity, and menopause broadens this limited understanding of distributive justice because the resources

provided to these employees typically violate the norms for equity and sometimes violate norms for equality. These resources violate the equity norm because the resources (e.g., breastfeeding rooms) are not provided based on performance (Grandey, 2001). These resources may violate the equality norm because employees in these groups are uniquely supported by certain resources that do not support people outside these groups. For example, providing free menstrual products for menstruating employees is irrelevant to male, non-menstruating employees and similarly irrelevant to female, non-menstruating employees.

As such, the theory outlined below seeks to develop deeper understanding of distributive justice by first exploring the effect of resources allocated according to need. Current justice research does not adequately illuminate the needs principal in distributive justice research because it only explores the effect of resources distributed according to equity principles. For example, pay dispersion (Zhang et al., 2023), merit pay systems (Adamovic, 2023), and grade distribution (Colquitt, 2001) all impact equity-based distributive justice perceptions. However, this evidence does not extrapolate to the provision of resources for menstrual, maternal, and menopausal employees because the resources provided to these employees (e.g., breastfeeding rooms) are not provided based on performance (Grandey, 2001). Thus, the theory outlined below develops deeper understanding of distributive justice because it explores allocation norms that rely on a non-equity principle.

The theory outlined below also seeks to develop deeper understanding of distributive justice research by exploring distributive justice perceptions formed based on all three principles – equity, equality, and need. Much of current justice research relies on the distributive justice sub-dimension of organizational justice (Colquitt, 2001; Rupp et al., 2017), but this measure reflects only perceptions formed based on the equity principle and ignores the additional

understanding that might be provided with inclusion of equality- or needs-based distributive justice perceptions. This is a glaring oversight in distributive justice research that measures equity-based distributive justice perceptions as a result of allocations that likely target equality- and needs-based distributive justice perceptions more. For example, predictors such as LMX (Li et al., 2023; Liang et al., 2018), gender-based injustices (Strah et al., 2024), or within-group pay dispersion (Zhang et al., 2023) likely impact equality- and needs-based justice perceptions in addition to equity-based justice perceptions, but each of these studies operationalized distributive justice perceptions as equity-based distributive justice perceptions only. These examples demonstrate that there is a current mismatch between allocation norms and our understanding of distributive justice perceptions. However, the theory section that follows explores the effects of needs-based allocations on all three principles of distributive justice perceptions. In doing so, I use allocation-perception alignment to develop consensus and provide an avenue for further research on distributive justice perceptions.

Lastly, before diving into the theoretical arguments, the section that follows explains how fairness heuristic theory will be applied as theoretical framework to support the propositions regarding menstruation, maternity, and menopause in the theory section.

Fairness heuristic and uncertainty management theory.

For this dissertation, I apply fairness heuristic theory and uncertainty management theory of fairness to explore the contingent effects of individual-level and organization-level pivot points on this distributive justice process. Menstruation, maternity, and menopause create uncertainty at work, and this individually driven uncertainty amplifies the fairness heuristic process of forming distributive justice perceptions. Further, organizations that provide rich messaging with allocation distribution amplify the fairness heuristic process. Before diving into

the details and background of fairness heuristic theory (van den Bos et al., 2001), the theory broadly suggests that individuals use heuristic processing when they form justice perceptions. This heuristic processing has implications for the fairness signals that employees attend to when they form perceptions and how these perceptions impact employee outcomes (van den Bos et al., 2001). Heuristic processing is a cognitive processing model that suggests that individuals rely on the limited information that is most accessible in their mental schema when forming perceptions rather than elaborating through their mental schema to form perceptions based on every piece of information available (Chaiken & Ledgerwood, 2012; Chaiken & Maheswaran, 1994). Thus, fairness heuristic theory is concerned with identifying what makes fairness information most accessible in employees.

Fairness heuristic theory draws from the group-value model (Lind & Tyler, 1988) and relational model (Tyler & Lind, 1992) of procedural justice, but the purpose of fairness heuristic theory is to provide explanation for how people form fairness perceptions for both procedural and distributive justice (van den Bos et al., 2001). From the group-value and relational models, fairness heuristic theory takes the three stages of justice perception formation. In the justice perception formation process, the first phase is referred to as the preformation phase (van den Bos et al., 2001). The preformation phase determines whether or not employees' justice perceptions will be affected, and information provided during this phase triggers justice perceptions. This phase answers the questions for why and when employees form justice perceptions (van den Bos et al., 2001). The second phase is referred to as the formation phase, and this phase involves the formation of justice perceptions (van den Bos et al., 2001). This phase informs how justice perceptions are formed. The final phase is the post-formation phase, and this phase involves reactions to justice perceptions (van den Bos et al., 2001). Information

from this phase develops understanding for how fairness perceptions are used among employees (van den Bos et al., 2001). I discuss each phase in further detail below and identify how each phase applies to the theory developed later.

The pre-formation phase is the time during which outcomes and procedures (e.g., resources) are attended to by employees. The pre-formation phase is concerned with the fairness signals that cause individuals to form fairness judgements and contexts that create greater reliance on these fairness signals (van den Bos et al., 2001). Importantly, when resources are distributed, recipients pay attention to the allocation norms used by allocators. Fairness heuristic theory suggests that individuals draw on the fairness signals they receive when asked to form distributive justice perceptions, and various aspects of the fairness signals increase their accessibility and salience and thus heuristic value (van den Bos et al., 2001). Working individuals face the fundamental social dilemma (Lind, 2001), which states that employees are forced to enter into a relationship of reciprocity with an organization even though they may not have much information as to whether or not the organization will actually engage in reciprocity for the employee's contribution (e.g., provide benefits or fair compensation). Thus, when this reciprocal relationship is highlighted, the fairness signals become more salient (van den Bos et al., 2001). Providing needs-based resources to employees highlights the reciprocal relationship between the organization and employees, which also increases the salience of fairness signals for heuristic processing. For example, an employee with an auto-immune disease that relies on their employer for healthcare has a much more salient reciprocal relationship with the organization than an employee that gets their healthcare benefits from a different source (e.g., spouse). Thus, the employee with an auto-immune disease likely forms stronger distributive justice perceptions associated with fairness signals. While this example reflects an individual facet that amplifies the

salience of distributed resources during the pre-formation phase, there are also examples of organizational decisions that amplify the salience of distributed resources. For example, if the organization chooses to promote their gender pay equity during each step of the recruitment process, this repeated promotion increases the salience of the distributed resources.

Of note, the pre-formation phase is of particular importance in the context of this study for two reasons. First, following the examples I presented above, I examine the effects of individual- and organization-level factors that increase the salience of distributed resources such as health-related uncertainty and resource messaging. Additionally, I suggest the resources presented in the pre-formation phase determine which distributive justice perceptions will be strongest during the formation phase because the allocation norm used by the organization determines which principles of distributive justice perceptions will be strongest. Because resources are distributed according to equity, equality, and need norms, the heuristic connection between each allocation norm and the individual's corresponding perception is strengthened. I discuss this application further in the theorizing in Chapter 3, but the section above provides evidence that there are multiple individual- and organization-level pivot points in the pre-formation phase that influence the fairness heuristic process.

During the formation phase, individuals decide on which information to use from the pre-formation phase (van den Bos et al., 2001), and this attention is often driven by the allocator norms used in resource distribution (Leventhal, 1976). Applying this to the three principles of distributive justice, during the formation phase, individuals decide on which principle is triggered most by the fairness information provided. For example, when fairness information contains easily interpretable information about inclusion, participants have increased perceptions of procedural justice (Lind & Tyler, 1988), which contains some aspects of the equality principle.

Thus, the heuristic ease with which employees associate fairness information with equity, equality, or need will determine which principle of distributive justice perceptions is strongest. The weights in the linear combination mentioned previously are indicators of which principle provides the strongest heuristic connection when needs-based resources are provided. Thus, when resources are distributed according to need, the weight for needs-based distributive justice perceptions should be stronger than the weights for equality- or equity-based distributive justice perceptions because needs-based resources are a heuristic for needs being met. In the theory section in Chapter 3, I argue that resources associated with menstruation, maternity, and menopause trigger needs-based justice perceptions most because they are most easily interpreted as supporting individual needs.

During the post-formation phase, individuals use their perceptions formed during the formation phase to guide their reaction to outcomes (van den Bos et al., 2001). Applying this to the three principles of distributive justice, the distributive justice perception that is strongest should have the greatest impact on employee work outcomes because the heuristic is strongest for that principle of distributive justice. In the theory section in Chapter 3, I argue that needs-based justice perceptions should most strongly impact employee well-being outcomes because the needs-based justice perceptions act as the strongest heuristic in influencing employee reactions to resource distribution.

I further argue in Chapter 3 that information richness associated with resource distribution is an organization-level contingency factor that boosts the heuristic process associated with fairness signals (Daft & Lengel, 1986). Information richness is increased when resource messaging contains multiple cues or indicators of distributive justice, and personalization to recipients (Daft & Lengel, 1986). Importantly, information richness also

increases the accessibility of distributive fairness information (Tversky & Kahneman, 1973), which serves to increase the fairness heuristic process. In sum, fairness heuristic theory suggests that individuals use cognitive shortcuts, or heuristics, when forming fairness judgements (van den Bos et al., 2001). Uncertainty management theory of fairness further builds on fairness heuristic theory to suggest that contexts of uncertainty increase the salience of fairness signals and increases use of heuristics when forming fairness perceptions (Lind & Van den Bos, 2002; van den Bos et al., 2001). The salience of fairness signals increases in uncertain context because fairness signals help employees cope with uncertainty (Lind & van den Bos, 2002). Indeed, "the key function of fairness is that it provides people with a way to cope with uncertainties" (Lind & Van den Bos, 2002, p. 184). Thus, employees increase their reliance on heuristics when they face uncertainty. In the theory section in Chapter 3, I first argue that information richness amplifies the heuristic process associated with distributive justice perception formation. I then argue that menstruation, maternity, and menopause create uncertainties among working women, which increases their reliance on fairness signals and heuristics.

CHAPTER THREE – THEORY AND PROPOSITIONS

Understanding distributive justice is important because justice is an essential component of individual well-being and thereby group functioning (Deutsch, 1975). Distributive justice impacts individual performance, group cohesion, and individual well-being, and allocators intentionally use distributive justice to achieve these positive outcomes (Leventhal, 1976). Importantly, most of the distributive justice research to date has developed understanding of the equity principle in distributive justice, virtually ignoring distributive justice according to the equality and needs principles. Indeed, beginning as early as 1976 and as recently as 2017, scholars have proclaimed that a narrow focus on equity does not provide a full comprehensive understanding of distributive justice (Leventhal, 1976, 1980; Rupp et al., 2017). Further, this narrow understanding does not reflect the phenomenon of distributive justice in current organizations. For example, while organizations acknowledge they use compensation to motivate performance (Gerhart & Milkovich, 1990), which is based on the equity principle, they also acknowledge using quotas to diversify leadership positions across the company to ensure these positions reflect racial and gender equality (Halliday et al., 2021), which is based on the equality principle. Organizations also provide resources based on need, such as providing menstruation products the same way they would toilet paper (Barnack-Tavlaris et al., 2019; Witten, 2023) or wheelchair access to all parts of the building. Thus, our current narrow understanding of distributive justice only explains a small portion of what organizations are actually doing, which limits the practical impact of distributive justice research (Whetten, 1989).

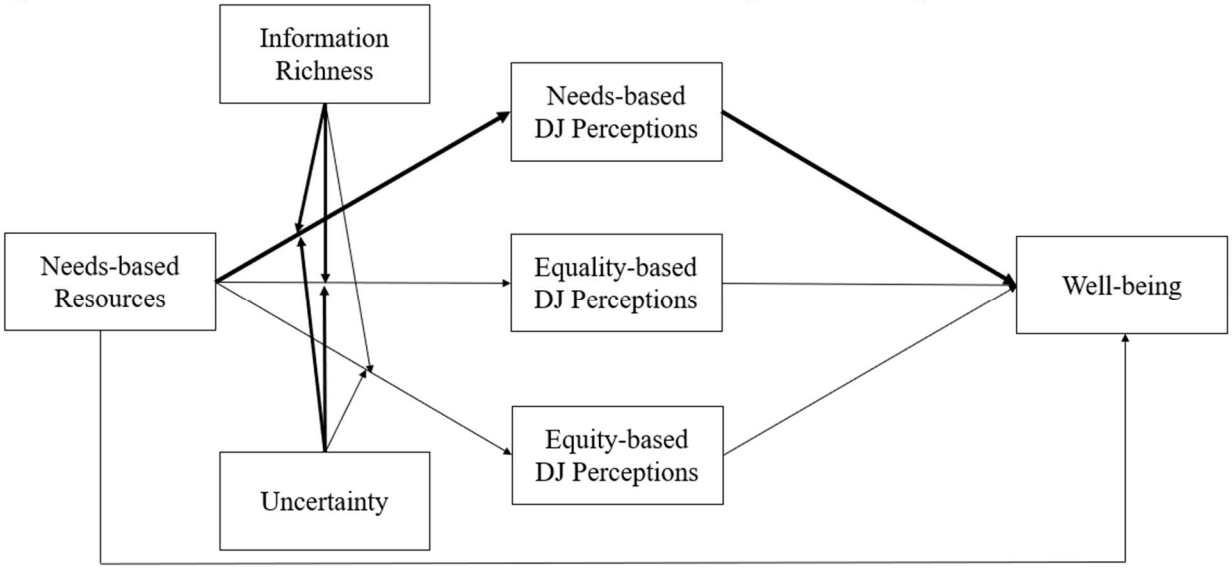
However, I suggest that the Three M's (Grandey et al., 2020), menstruation, maternity, and menopause, provide critical insight into distributive justice because many of the resources provided to support employees in these phases are provided according to needs- and equality-

based allocation norms. Thus, these resources stray from the traditionally studied allocation norm of equity (Colquitt, 2001). Further, the experiences associated with these reproductive phases provide ideal opportunities to test the critical theoretical components of distributive justice. Distributive justice is "intrinsically concerned with both individual well-being and societal functioning," (Deutsch, 1975, p. 140), which means that distributive justice should be studied through a well-being lens. Empirical research on menstruation (Ponzo et al., 2022), maternity (Jones et al., 2016), and menopause (Faubion et al., 2023) use a well-being lens. One way research on the Three M's provides critical insight into distributive justice is that the well-being research in these areas often uses a dynamic approach to study changes in well-being over time, which is necessary for understanding how needs change (Bierhoff et al., 1986). Further, how organizations choose to "effectively promote individual well-being depend[s] upon the external circumstances confronting the group and upon the specific characteristics of the individuals composing it" (Deutsch, 1975, p. 140). Within menstruation, maternity, and menopause, employees face similar external circumstances that many others do not experience. For example, non-menstruating employees do not experience the physical symptoms associated with menstruation, and only menopausal employees experience hot flashes regularly. Thus, studying the specific characteristics associated with the Three M's also provides critical insight into distributive justice theory because it explains how external circumstances intersect with workplace distributive justice.

The propositions that follow explore how menstruation, maternity, and menopause resources should differentially impact the three principles of distributive justice perceptions. I then draw on fairness heuristic theory (van den Bos et al., 2001) and uncertainty management theory (Lind & van den Bos, 2002) to argue that menstruation, maternity, and menopause

increase uncertainty, which increases employees' reliance on fairness heuristics (i.e., needs-based resources). Finally, I explain why well-being is an especially relevant work outcome for menstruating, maternal, and menopausal employees and argue that each principle of distributive justice perceptions should be differentially related to well-being. The full theoretical model is depicted in Figure 2.

Figure 2. Theoretical Model for Menstruation, Maternity, and Menopause



Note. Theoretical model displays proposed relationships between variables. Thick arrows indicate that these paths are expected to be stronger than other paths.

Resources, Needs, and Distributive Justice

The literature review established that when allocators make distributive justice decisions and recipients form distributive justice perceptions, their distributive justice decisions and perceptions are indicated by a linear weighted combination associated with each principle of distributive justice (Leventhal, 1980). Consider the resource provision of a lactation room for maternal employees. When organizations provide employees in maternity with a room for breastfeeding or pumping, it should lead to positive fairness perceptions across all three principles because employees use the information they have available when forming all

distributive justice perceptions (van den Bos et al., 2001). Fairness signals of any kind are available information, so fairness signals should lead to positive distributive justice perceptions for each principle because they still satisfy the heuristic for available fairness information even if the perception in question is equity. For example, even though the lactation room is not provided according to equity, the lactation room is still a signal that organizations meet the norms of reciprocity at stake in employees' fundamental social dilemma (Lind, 2001). In the case of equity-based distributive justice perceptions, the lactation room still acts as a heuristic indicator that the organization would fairly distribute resources according to equity if equity was at stake. Thus, even though organizations provide menstruation, maternity, and menopause resources based on need, these resources act as fairness signals for all three principles of distributive justice because the signals are not exclusively related to one type of distributive justice perception. This consistent positive relationship is reflected in parts a-c of Propositions 1-3 below.

However, this consistent positive relationship between needs-based resources and distributive justice perceptions should differ in magnitude because strength differences in recipients' perceptions are dependent on perceptions of allocator norms. First, recipients' needs-based distributive justice perceptions should be strong. The conditions for allocation directly influence the strength of individual perceptions of those allocations (Deutsch, 1975). When distribution norms are favored by authorities (e.g., allocators), individuals will assign higher weight to that distribution principle when forming perceptions of distributive justice (Leventhal, 1980). Importantly, when individuals form the weighted linear combination for distributive justice perceptions, it reflects an individuals' perception of the recipients' deservingness of each outcome (Leventhal, 1980). When distributions highlight individual well-being, such as distributions in which "welfare is the primary concern, the individual is likely to assign high

weight to the needs rule" because they believe that recipients are deserving of having their welfare supported by the organization (Leventhal, 1980, p. 8). Needs-based resources for employees in menstruation, maternity, and menopause are resources that highlight individual welfare and indicate the employees are deserving of the organization's support for their welfare. Therefore, the provision of these resources should strengthen the magnitude of recipients' needs-based distributive justice perceptions.

Additionally, needs-based distributive justice perceptions should be strengthened due to locus of control attributed to individuals' physical symptoms associated with menstruation, maternity, and menopause. When individuals' needs are associated with an internal locus of control, they are seen as less deserving of support for that need and individuals prefer outcome distribution according to equity, for example (Van Hootegem et al., 2020). When individuals' needs are associated with an external locus of control, recipients are seen as more deserving of support for that need and individuals prefer outcomes distribution according to need (Van Hootegem et al., 2020). Physical symptoms associated with menstruation and menopause are likely to be perceived as having an external locus of control – unavoidable and unpredictable physical experiences associated with hormone changes. However, even though maternity is often a choice and some women choose to remain childless (Dumas & Perry-Smith, 2018; Wilkinson & Rouse, 2023), but the physical symptoms associated with pregnancy and breastfeeding are often unavoidable, employees may attribute internal or external locus of control to maternity resources. Among menstruation, maternity, and menopause, the extent to which employees believe the outcomes support a need with external locus of control increases the strength of employees' needs-based distributive justice perceptions. In sum, employees should demonstrate strong needs-based distributive justice perceptions when the outcomes highlight individual

welfare and increase attributions of deservingness for need support among recipients. Next, I explain how needs-based distributive justice perceptions are affected more than equity-based distributive justice perceptions and in tandem with equality-based distributive justice perceptions.

First, in the case of needs-based resources, perceptions based on the equity principle should be at odds with those based on the needs principle (Deutsch, 1975), so equity-based distributive justice perceptions should be weaker than needs-based distributive justice perceptions. I established in the literature review that when individuals form equity-based distributive justice perceptions, they compare the equivalence of their outcome to their input (Adams, 1965). When a lactation room is provided to all breastfeeding employees, access to the resource is not contingent upon input or performance. Because the provision of menstruation, maternity, and menopause resources is not based on input, equity-based distributive justice perceptions associated with those resources are deactivated and should be positive, but lower in magnitude than needs- and equality-based distributive justice perceptions. The value should be positive because as I mentioned previously, fairness signals act as a heuristic for all three principles of distributive justice perceptions, but these heuristics are weaker for equity-based distributive justice perceptions than equality- and needs-based distributive justice perceptions.

Whereas equity-based distributive justice perceptions are at odds with needs-based distributive justice perceptions, equality-based distributive justice perceptions may be at odds or work in tandem with needs-based distributive justice perceptions depending on the distribution norm used by the allocator as well as individual preferences. First, empirical research indicates that even when individual welfare is highlighted, employees prefer equality-based distribution over needs-based distribution (Van Hootegem et al., 2020). Universal support for health is more

widely favored than selective support for health because it is seen as more morally just (Laenen & Gugushviti, 2021). When a resource is distributed equally (rather than selectively), it guarantees that anyone who has a need has the opportunity to support that need. Thus, needs-based resources that are also distributed equally boost both types of distributive justice perceptions. Further, it is possible to have distributive justice perceptions that strengthen in tandem because the weighted linear combination is not zero-sum. That is, an increase in equality-based distributive justice perceptions does not necessarily require a decrease in needs-based distributive justice perceptions. Therefore, it follows that needs-based resources should demonstrate a strong impact on equality-based distributive justice perceptions.

Additionally, allocators distribute many needs-based resources according to needs- and equality-based allocation norms and the recipients form their heuristic connections accordingly (Leventhal, 1976; van den Bos et al., 2001). For example, maternity leave provided as an organizational benefit is often supplied equally to female employees. In this case, the allocators' distribution norm uses equality and need, so perceptions could reflect similar weights in the linear combination of distributive justice perceptions. An example of opposing equality- and needs-based distribution norms is that some menopausal employees receive the ability to control the thermostat, but some employees do not have the ability to control it because there are a limited number of thermostats in the organizational space. In this case, because the equality- and needs-based allocation norms are at odds with each other, the needs-based distributive justice perceptions are likely stronger than equality-based distributive justice perceptions for those whose needs are met (e.g., thermostat control). Thus, the allocation norms used dictate whether equality- and needs-based distributive justice perceptions are at odds with each other or work in tandem.

In sum, resource distribution for menstruating, maternal, and menopausal employees relies on needs-based distributive justice allocation norms, and the type of allocation norm used is one determining factor in value weight for each type of distributive justice. Thus, needs-based resources should be positively related to needs-based distributive justice perceptions because the resources increase individual perceptions of deservingness associated with the need and authorities' use of needs-based distribution legitimizes this deservingness. Further, the physical symptoms associated with menstruation, maternity, and menopause are not under the control of the employee and therefore are likely to be associated with an external locus of control. Further, when allocation also follows the equality norm, the weight for equality-based distributive justice perceptions should be similar to that of needs-based distributive justice (i.e., a tandem effect). This occurs because when resources are distributed to support individual well-being, individuals demonstrate a preference for equality- and needs-based distributive justice over equity-based distributive justice (Van Hootegem et al., 2020). Individuals have this preference because universal (i.e., equal) support for needs is a fairness indicator that everyone will be able to have their needs met when and if the time arises. Thus, they perceive that the organization not only wants to meet people's needs, but that everyone's needs will be met. the resources are not distributed equally, equality-based distributive justice perceptions should be weaker than needs-based distributive justice perceptions. Menstruation, maternity, and menopause resources do not follow the equity norm, so the weight for equity-based distributive justice perceptions should be weaker than both equality- and needs-based distributive justice perceptions. In conclusion, strength differences between distributive justice perceptions depend on resource allocation norms. Propositions 1-3 below address the effects of menstruation, maternity, and menopause resources on employee distributive justice perceptions.

Proposition: 1) Menstruation, 2) maternity, and 3) menopause needs-based resources are positively related to a) equity-, b) equality-, and c) needs-based distributive justice perceptions, and d) the strength difference in this positive effect is dependent on which resource allocation norms are strongest.

In the section above, the distribution of menstruation, maternity, and menopause resources is referred to as the preformation phase according to fairness heuristic theory (van den Bos et al., 2001). During the preformation phase, the distributed resources act as a signal that initiates justice judgement formation (van den Bos et al., 2001). In the section below, I discuss how allocator and recipient contingency factors associated with menstruation, maternity, and menopause influence the fairness heuristic process.

Distributive Justice Messaging

I previously argued that the type of resource allocation norm used in distributing resources influences the strength of the heuristic for each type of distributive justice principle. The resource allocation norm is just one organizational decision point when providing menstruation, maternity, and menopause needs-based resources that influences fairness heuristics. An additional organizational decision point that also influences fairness heuristics is the way the needs-based resources are communicated to employees. The way organizations communicate resource allocation varies from organization to organization – some limit resources to HR materials, others advertise their resources during recruitment, and others may provide resources with no additional messaging at all. However, needs-supportive workplaces need to ensure that reproductive policies are effectively communicated to all employees (Watson, 2023). As such, I draw on fairness heuristic theory and media richness theory to explain how

organizational decisions around resource allocation communication strengthen the heuristic effect of needs-based resources (Daft & Lengel, 1986; van den Bos et al., 2001).

Media richness theory suggests that the amount and richness of information are an important component of organizational communication (Daft & Lengel, 1986). Information richness is defined as "the ability of information to change understanding within a time interval" (Daft & Lengel, 1986, p. 560), and levels of richness are determined according to the communication medium's ability to provide immediate feedback (e.g., face-to-face v. email), the number of cues and channels used, and personalization (Daft & Lengel, 1986). For example, interpersonal communication with managers or leaders is richer than relying simply on rules and policies (Daft & Lengel, 1986). Lastly, communication methods that relate to multiple employee frames of reference or quickly clarify ambiguities are considered rich forms of communication (Daft & Lengel, 1986). In short, the richness of communication reduces uncertainties regarding the meaning of the information (Daft & Lengel, 1986).

Needs-based resources may be communicated to employees using a variety of richness. For example, policies communicated in HR materials have lower richness than those communicated in HR materials and by managers or organizational leaders because the communication from managers provides additional information regarding fairness. In the empirical study in Chapter 4, I operationalize media richness as the amount of fairness information shared with participants when they are informed about needs-based resource distribution. Certainly, policies and procedures are one of the lowest forms of media richness (Daft & Lengel, 1986), but one goal of the empirical study in this dissertation is to provide organizations with impactful practical recommendations that require low organizational investment. Changing the amount of information communicated in organizational policies is a

simple change with influential effects. Thus, the empirical chapter explores the heuristic effects of the amount of information specifically, but the rest of this section explores variation in information richness more broadly. When I use the term increased richness, I am referring to the conceptual definition of richness that implies a richness spectrum that runs from low to high.

Information richness strengthens the heuristic process in the pre-formation and formation phases of fairness judgements. I previously argued that when organizations offer needs-based resources, the resources provide information regarding fairness for employees (van den Bos et al., 2001). When employees are asked to make fairness judgments, they use heuristic processing to call those resources to mind (van den Bos et al., 2001). As richer information regarding needs-based resources is provided, it increases the number of fairness signals available to employees. During heuristic processing, an increase in fairness information also increases the availability and accessibility for retrieval when employees make fairness judgements (Tversky & Kahneman, 1973). Thus, the increased availability and accessibility of fairness information cultivated by richer information leads to stronger distributive perceptions due to the heuristic effects (Schwarz & Vaughn, 2002; Tversky & Kahneman, 1973). As such, I suggest that increased information richness regarding needs-based resources increases the relationship between needs-based resources and distributive justice. I posit the following proposition regarding needs-based resource communication.

Proposition 4: Richness of needs-based resource communication strengthens the relationship between needs-based resources and a) equity-, b) equality-, and c) needs-based distributive justice perceptions.

Physical Symptoms and Uncertainty

Above, I explained how the allocator contingency factor of information richness influences the fairness heuristic process. Here, I demonstrate that uncertainty associated with physical symptoms is a recipient contingency factor that influences the fairness heuristic process when needs-based resources are provided. First, uncertainty management theory of fairness builds on fairness heuristic theory and suggests that contexts of uncertainty increase employees' reliance on fairness signals and in turn, strengthens distributive justice perceptions (van den Bos et al., 2001; Lind & van den Bos, 2002). Thus, uncertain contexts have implications for the preformation (i.e., resource distribution) and formation (i.e., distributive justice perceptions) phases (van den Bos et al., 2001). Importantly, these uncertain contexts can be created by "personal situations confronted by workers" (Lind & Van den Bos, 2002, p. 207). Below, I discuss how menstruation, maternity, and menopause create contexts of uncertainty at work.

The crossover between menstruation and work leads to uncertainty among menstruating employees. First, menstrual cycle length can be unpredictable within women (NIH, 2017), which means it can be difficult to pinpoint the start date of one's upcoming menstruation. This means that women have uncertainty regarding if or when they will start their period, and it could start while they are working. In fact, many women unexpectedly start their period in public and do not have the supplies they need (Rawat et al., 2023). Once started, the most present physical symptom associated with menstruation is menstrual bleeding, which creates a variety of uncertainty factors. The length and severity of bleeding can be unpredictable, as menstruation ranges 1-14 days and varies within women (Hantsoo, Rangaswamy, et al., 2022; Hardy & Hunter, 2021). At work, menstrual bleeding creates uncertainty because employees may lack control over bathroom breaks. For example, employees that work in manufacturing may take

scheduled or limited bathroom breaks, scientists may be working in the field all day with limited bathroom access, or surgeons could be stuck in a long procedure that restricts their ability to get to the bathroom. These situations create uncertainty regarding the likelihood of blood stains or leaks, a focal concern among menstruating employees (Segran, 2016). Beyond the blood, menstruating employees experience dysmenorrhea (Bernardi et al., 2017), fatigue (Ponzo et al, 2022), and irritability (Pierson et al., 2021) as a result of hormone changes. However, the severity, duration, and frequency of these symptoms varies within the day, the menstrual cycle, and the woman (Schoep et al., 2019). The variation in physical symptoms creates a context of uncertainty during menstruation.

The intersection between maternity and work also leads to uncertainty among employees in maternity. First, pregnancy is a temporary experience (Greenberg et al., 2016). Although the transition in and out of pregnancy is clearly demarcated, the transitory nature of pregnancy creates uncertainty among maternal employees (Greenberg et al., 2016). As women become increasingly pregnant leading up to birth, a physical experience associated with maternity, they face uncertainty regarding pregnancy disclosure at work because their changing maternal body is a violation of the stereotypical, able, and ideal organizational body (Davies & Frink, 2014; Lawrence et al., 2023). Additionally, pregnant employees face uncertainty that their job will still be available when they are ready to return to work (Paustian-Underdahl et al., 2019). Upon returning to work, breastfeeding and lactation create uncertainty among women in maternity. For example, women face uncertainty regarding if their lactation will cease upon returning to work (Guendelman et al., 2009) or if they will face breastfeeding interference (e.g., inadequate space, bans, inflexible schedules) or mishaps (e.g., leaks) during work (Chrisler, 2011; Gabriel et al.,

2020; Gatrell et al., 2017; Riaz & Condon, 2019). These physical experiences associated with pregnancy and post-pregnancy create a context of uncertainty for women at work.

Finally, managing menopause at work also leads to uncertainty among menopausal employees. Hot flashes, or vasomotor symptoms, are one of the most common symptoms among menopausal women (Williams et al., 2008). Hot flashes create a context of uncertainty at work because their onset, severity, length, and frequency are unpredictable (Hardy et al., 2018), and many women experience a lack of control in managing their symptoms (Kittell et al., 1998). Additionally, hot flashes can interrupt work (Pinkerton, 2015), and work interruptions are associated with uncertainty (Parke et al., 2018). On top of hot flashes, menopausal employees also experience sleeplessness, fatigue, and irritability (High & Marcellino, 1994; Jack et al., 2014), which can lead to anxiety and uncertainty at work. Some menopausal women also experience brain fog or forgetfulness as a result of changing hormone levels (Epperson et al., 2013; Maki & Henderson, 2016), which creates uncertainty regarding one's own competence (Kittell et al., 1998). Thus, the lack of control and unpredictability associated with menopause symptoms creates a context of uncertainty at work.

In sum, employees in menstruation, maternity, and menopause face uncertainty at work as a result of the physical symptoms associated with each reproductive phase. This uncertainty context is relevant because distributive justice is especially important when "life events inside *or outside* work increased general feelings of uncertainty" among employees (Lind & Van den Bos, 2002, p. 213). The contexts of uncertainty created by menstruation, maternity, and menopause amplify the effects of the fairness heuristic process (Lind & Van den Bos, 2002; Van den Bos, 2001). The uncertainty means that when employees are menstruating, in maternity, or menopausal, the resources become more important to employees and employees' justice

perceptions are increased. This contingency effect of menstruation, maternity, and menopause is addressed in Propositions 5-7 a-c below. Further, the previous argument that strength differences in these relationships depends on resource allocation norms is included in part "d" of the propositions below.

Proposition: The positive relationship between 5) menstruation, 6) maternity, and 7) menopause needs-based resources and a) equity-, b) equality- and c) needs-based distributive justice perceptions is moderated by uncertainty, such that uncertainty strengthens the positive relationship. Strength differences in this moderation effect are d) dependent on which resource allocation norms are strongest.

Propositions 1-7 address the effects of the pre-formation phase (i.e., needs-based resources) on the formation phase (i.e., equity-, equality-, and needs-based distributive justice perceptions (van den Bos et al., 2001). These relationships are depicted in the left side of the theoretical model in Figure 2. In the section below, I first address the direct effect of needs-based resources on well-being, and I then address the right side of the theoretical model. I argue that needs-based resources in the pre-formation phase and distributive justice perceptions from the formation phase should impact well-being in the post-formation phase (van den Bos et al., 2001).

Resource Allocation and Well-being

Early distributive justice theory suggests that the allocation side of "distributive justice is concerned with the distribution of the conditions and goods which affect individual well-being", and well-being consists of psychological, physiological, economic, and social well-being (Deutsch, 1975, p. 137). When distributed resources support individual values, they will lead to better group functioning and individual well-being as it relates to work (Deutsch, 1975). This means that distributed resources should be broadly, positively related to well-being outcomes

among employees. More specifically, needs-based resources like those provided for menstrual, maternal, and menopausal employees should have the strongest impact on individual well-being because the intention of needs-based resource allocation is to support individual health (Leventhal, 1976).

As such, the distribution of needs-based resources is relevant to menstruation, maternity, and menopause because the resources are distributed to support the individual welfare of employees in those reproductive phases. Organizations acknowledge that their intention of providing these resources is to support employee needs. For example, when the U.S. Women's National Team started training and eating according to female soccer players' menstrual cycles, they noted the purpose was about "educating females to become more attuned to their bodies and introducing strategies that can reduce [menstruation] symptoms" (Brennan, 2023). Disney offered to pay for employees' need to travel for pregnancy termination as a means to ensure "comprehensive access to quality and affordable care for all employees, including reproductive care" (Telford & Frankel, 2022). Further, the University of Leicester recently made changes to workplace support for menopausal employees, and they cited that their purpose was to respond to the physical symptoms associated with menopause and support "well-being and stress at work" (Beck et al., 2022, p. 518). These examples demonstrate that the intention of needs-based resources is to support the well-being of employees across the three reproductive phases. Below, I discuss well-being across menstruation, maternity, and menopause, and how needs-based resources support employees' well-being in each reproductive phase.

I previously noted that a focal concern during menstruation is managing the unpredictable nature of menstruation onset and any possible leaks or stains that may occur throughout menstruation. When organizations provide resources that address these concerns for

menstruating employees, the resources improve employees' well-being. For example, organizations that provide free menstrual products in bathrooms alleviate any mental fatigue associated with extra preparedness for menstruation onset (Sang et al., 2021). When menstruating employees have control over their bathroom breaks, it reduces the mental gymnastics required to appropriately time restroom trips and rumination over possible leaks in the meantime (Rawat et al., 2023). Organizations that provide flexible work arrangements or menstrual leave for employees are particularly helpful for employees that experience cramps during menstruation because it provides employees with the opportunity to create a comfortable workspace and the flexibility to recover comfortably (Levitt & Barnack-Tavlaris, 2020; Sang et al., 2021). Reduced rumination (Berset et al., 2011), a comfortable work environment (Davila et al., 2019; Duan & Wang, 2017), and more control (Thomas & Ganster, 1995) are positively related to individual well-being outcomes. Thus, when organizations provide menstruation resources, these needs-based resources should increase menstruating employees' well-being.

In maternity, mother and baby health become salient to working women (Ladge et al., 2012). Because many employees continue to work throughout pregnancy and return to work following pregnancy, well-being is important to consider among employees in maternity, and importantly, resources provided to employees in maternity do impact individual well-being. For example, supervisor and coworker support reduces stress during pregnancy, and positively influences post-partum health and recovery (Jones et al., 2022). Upon returning to work, perceived organizational support reduces stress (Little & Masterson, 2023). Additionally, providing breastfeeding space for lactating employees is related to increased breastfeeding self-efficacy and breastfeeding duration (Gabriel et al., 2020). Thus, needs-based maternity resources are positively related to well-being outcomes among employees in maternity.

Menopause creates temporary and long-term health changes among female employees, such as depression (Bromberger et al., 2011), cognitive performance (Greendale et al., 2009), and enduring hot flashes (Freeman et al., 2014). Maintaining menopausal employees' well-being is vital to keeping menopausal employees in the workplace (Jack et al., 2014). Indeed, menopause resources can and do influence menopausal employees' health outcomes. For example, menopausal employees in organizations that provide flexible work arrangements or well-being rooms aid employees in managing their acute menopause symptoms (Jack et al., 2016). When organizations provide menopause information to employees and supervisors (Jack et al., 2014), menopausal employees are more likely to disclose menopause-related symptoms (Hardy et al., 2019), and disclosure is positively related to individual well-being (Jones et al., 2016). Further, when organizations provide women with access or control to the thermostat, menopausal employees experienced fewer and less severe menopause symptoms (Bariola et al., 2017). Thus, needs-based resources are positively related to health outcomes among menopausal employees.

In sum, these examples above indicate that organizations indicate they desire to support employees' well-being when they used the needs-based allocation norm, and that these needs-based resources for women in menstruation, maternity, and menopause support individuals' well-being. These examples align with distributive justice theory, which suggests that conditions and goods like menstruation, maternity, and menopause needs-based resources should support employee well-being (Deutsch, 1975). As such, the proposition below reflects the argument presented above.

Proposition: 8) Menstruation, 9) maternity, and 10) menopause needs-based resources are positively related to well-being.

The proposition above suggests a direct effect of needs-based resources on employee well-being. However, distributive justice theory and fairness heuristic theory also suggests that distributive justice perceptions are a mechanism between resources and well-being outcomes (Deutsch, 1975; van den Bos et al., 2001). The resources provided in the preformation phase influence distributive justice perceptions developed in the formation phase, which in turn impact employee outcomes (van den Bos et al. 2001). Indeed, perceptions of fairness are positively associated with well-being (Reb et al., 2019; Sparr & Sonnentag, 2008) and personal health (Lucas et al., 2013). Thus, Propositions 11a-c below reflects that all three principles of distributive justice perceptions should be positively related to employee well-being. Though it is not explicitly stated in the proposition, I also expect this relationship to be the same across employees in menstruation, maternity, and menopause.

I also suggest that the change in well-being outcomes will be strongest for needs-based distributive justice perceptions in comparison to equity- and equality-based distributive justice perceptions. Fairness heuristic theory suggests that the principles with the strongest heuristics will lead to the strongest effects (van den Bos et al., 2001). In this case, the provision of needs-based resources for menstruating, maternal, and menopausal employees provides the strongest heuristic connection to needs-based distributive justice perceptions because the resources are the most useful and important in satisfying that principle of justice in comparison to equity and equality (Lind and van den Bos, 2002). Thus, part "d" of the proposition below reflects this strength difference.

Proposition 11: A) Equity-, b) equality-, and c) needs-based distributive justice perceptions are positively related to well-being, and d) the positive effect is stronger for needs-based distributive justice perceptions than equity- or equality-based distributive justice perceptions.

Given Propositions 1-11 above, it follows that there should be a positive indirect effect of menstruation, maternity, and menopause resources on employee well-being via distributive justice perceptions, and that this indirect effect should be strongest for needs-based distributive justice perceptions. Further, this indirect effect should be conditional on contexts of uncertainty created by menstruation, maternity, and menopause, as well as information richness. The indirect effect should be stronger when employees face the physical symptoms associated with menstruation, maternity, or menopause (compared to when they do not face physical symptoms) because the uncertainty created by physical symptoms increases the salience of fairness signals and strengthens distributive justice perceptions. Further, the conditional indirect effect associated with information richness should reflect that of menstruation uncertainty because information richness increases the availability of fairness information, which strengthens the effect of resources on distributive justice perceptions. Thus, the proposition below reflects both theoretical conditional indirect effects.

Proposition: The indirect effect of 12) menstruation, 13) maternity, and 14) menopause needs-based resources on well-being via a) equity-, b) equality-, and c) needs-based distributive justice perceptions is moderated by uncertainty and information richness, such that uncertainty and information richness strengthen the positive indirect effect.

In the chapter that follows, I test the above propositions for menstruating employees. The chapter begins with an introduction to the study and a review of the theory and hypotheses specifically for menstruating employees. I then present the results for two empirical studies, and the fifth chapter contains a discussion of the results.

CHAPTER FOUR – EMPRICAL STUDY

Recently, the Wimbledon organization altered its all-white clothing rules for female tennis players and now allows female tennis players to wear black shorts under their skirts instead of only white (Wamsley, 2022). This rule change is designed to support menstruating tennis players, many of whom report using hormonal contraceptives to alter the timing of their menstruation so it does not occur during the Wimbledon tournament (Wamsley, 2022). Wearing white shorts with constant fear of staining them draws focus away from the task at hand – performing at the highest possible level. By giving players a different, more supportive uniform option, Wimbledon reduces the amount of cognitive effort they expend in managing uncertainty about uniform stains during matches and redirects players' focus to performance. This simple, yet monumental uniform change is an example of a distributive resource allocation guided by the needs of menstruating players in the form of menstruation needs-based resources. Other examples of menstruation needs-based resources include providing menstrual products in employee restrooms, flexible work arrangements to accommodate menstrual symptoms, or menstrual leave to all female employees. Distributive justice theory refers to these resources as needs-based resources because they are provided according to individual or group need (Deutsch, 1975).

Needs-based resources are distributed according to need, and these resources are one of three principles used to guide allocations and perceptions of distributive justice (Deutsch, 1975). Early justice theory argued that distributive justice is comprised of three principles based on equity, equality, and need. However, current mainstream justice research predominantly relies on one measure of distributive justice (Colquitt, 2001), and this measure only reflects the equity principle of the original theory. Even though distributive justice research has proliferated in the

last few decades, the research to date presents a narrow understanding of distributive justice that ignores the equality and need principles in distributive justice (Rupp et al., 2017).

One reason researchers hesitate to study the needs principle in distributive justice is because needs are often individualized and fluctuate in salience according to context (Bierhoff et al., 1986). However, menstruating employees' needs also change throughout their menstrual cycle, so understanding the effect of menstruation resources on menstruating employees provides a unique opportunity for broadening our current understanding and empirical approach to distributive justice. This study applies best practices from menstruation research and dives into the complexity of the need principle of distributive justice (Leventhal, 1980).

The goal of this study is to provide better understanding of how the need, equity, and equality principles of distributive justice work together when organizations provide resources according to employee needs. As such, I investigate the effect of providing menstrual products in employee bathrooms, a needs-based resource, on menstruating employees' perceptions of distributive justice according to need, equity, and equality (Deutsch, 1975). I use early justice theory to explain why menstruation resources should elicit stronger needs- and equality-based distributive justice perceptions compared to equity (Leventhal, 1976), and then evoke fairness heuristic theory and theory of uncertainty management (Lind & van den Bos, 2002; van den Bos & Lind, 2002) to argue that menstruation creates a context of uncertainty that increases employee distributive justice perceptions.

Across two studies, I demonstrate that the uncertainty associated with menstruation at work creates a context that increases the salience of needs-based menstruation resources and increases the positive distributive justice judgments associated with providing menstruation resources to employees. The first study uses a quasi-experimental longitudinal field study design.

I measured participants' distributive justice perceptions (equity, equality, and need) across multiple menstrual cycles before and after menstruation resources were provided, and the results from this study indicate that employees' needs- and equality-based distributive justice perceptions increase when menstruation resources are provided and that this increase is stronger when women have menstruation uncertainty. The second study uses an experimental design to explore the media richness effects of needs-based resource messaging to determine how media richness of the message affects distributive justice perceptions.

This study has contributions to distributive justice research and research on women's health at work. First, this study contributes to research on women's health at work because the menstruation context used here can be applied to the experiences of maternal and menopausal women (Grandey et al., 2001). This study is the first in the area to apply an uncertainty management framework to women's physical health experiences in the workplace (Lind & van den Bos, 2002), yet unique uncertainties characterize menstruation. For example, menstruating employees experience uncertainty associated with menstrual bleeding at work. Thus, this study speaks to the uncertainty created by women's reproductive health experiences across the working lifetime. The understanding of uncertainty developed here also contributes to the well-developed research on stigmatization of women's reproductive health experiences at work. Stigmatized employees experience uncertainty (Clair et al., 2005), so the results of this study indicate that providing targeted resources alleviates one negative facet of stigmatization (Pachankis et al., 2018). Lastly, this study bridges the gap between women's health and distributive justice because the fluctuation in menstruating women's needs requires a broader approach to distributive justice.

This study responds to the warning that current distributive justice research is too limited (Cropanzano et al., 2001; Grandey, 2001; Rupp et al., 2017) and provides initial evidence that a broader, more comprehensive definition is required in some scenarios. I argue and the results show that some resource distributions target individuals' values for need and equality more than they target equity. I use these results to begin building a broader foundation for distributive justice theory (Deutsch, 1975). Re-building distributive justice theory requires more research that simultaneously incorporates the multiple principles of distributive justice, and this study demonstrates that there may be a much bigger picture to distributive justice than we currently have.

I then provide evidence that our current approach to distributive justice research would be strengthened by aligning the type of distributed resource with the appropriate facet of distributive justice. For example, organization-provided menstruation resources are a clear example of distributive justice – a condition or good distributed to support individual well-being (Deutsch, 1975; Leventhal, 1976). Yet equity does not adequately capture the fairness perceptions associated with needs-based resources because the resources are not provided according to input (Adams, 1965). Thus, I demonstrate that alignment between resources and perceptions is critical to expanding distributive justice theory and research, and I describe how past research has suffered from allocation-perception misalignment.

The rest of this chapter is organized as follows. I first provide a review of the research on menstruation as well as distributive justice to situate the theoretical argument. I then draw on early distributive justice theory (Deutsch, 1975; Leventhal, 1976), fairness heuristic theory (van den Bos et al., 2001), and uncertainty management theory (Lind & van den Bos, 2002) to develop the hypotheses in the empirical model. I then draw on media richness theory to explore

how needs-based resource framing impacts fairness heuristics and distributive justice perceptions. Following the theory section, I describe the method and report the results from two studies.

Menstruation at Work

One important feature of the menstrual cycle is that although it occurs repeatedly, the experience is often unpredictable. The average length of women's menstrual cycles is 28-35 days (NIH, 2017), but this average does not apply to all women all the time (Schoep et al., 2019). Symptoms typically vary throughout the cycle, meaning women experience mood swings more frequently on some days and on other days they experience menstrual cramps (Bernardi et al., 2017; Motro et al., 2019). Further, symptom frequency and severity vary from cycle to cycle within (Schoep et al., 2019) and between women (Bull et al., 2019). The unpredictability of menstruation and its symptoms makes it difficult to manage at work (Sang et al. 2021). Managing menstruation creates a mental burden because it requires managing uncertainty about when symptoms arrive, how bad they will be, and if one has access to menstrual products and bathrooms (Barrington et al., 2021). This uncertainty is especially pronounced among women with severe menstruation conditions like endometriosis (Lemaire, 2004).

The preceding paragraph provides evidence that menstruating employees experience several physical symptoms throughout the menstrual cycle, and those associated with menstruation are fraught with uncertainty. Recently, organizations have started to take notice of menstruating employees' needs to alleviate the uncertainty experienced during menstruation (Hardy & Hunter, 2021). In the example used in the introduction, Wimbledon changed the uniform rules to provide menstruating women a darker uniform option that hides leaks or stains, should they occur. This uniform change provides female competitors a sense of certainty that

even if they do experience a leak while playing, it will not be visible as it would be in white shorts and competition can continue. When the Government of Canada recently mandated that all federally regulated organizations provide menstrual products in employee bathrooms, they cited financial insecurity as one of their reasons for providing the menstrual products (CNW Group, 2023). They want employees to be certain they will have access to menstrual products at work.

These examples demonstrate that organizations distribute resources that appeal to the specific needs of menstruating employees. For example, only menstruators use or need menstrual products in work bathrooms, and changing a uniform to black does not support any specific needs for non-menstruating tennis players. This specificity in needs is important, because needs play an underexamined but critical role in distributive justice (Rupp et al., 2017) and require an approach that is grounded in theory but strays from the traditional approach to distributive justice (Grandey, 2001).

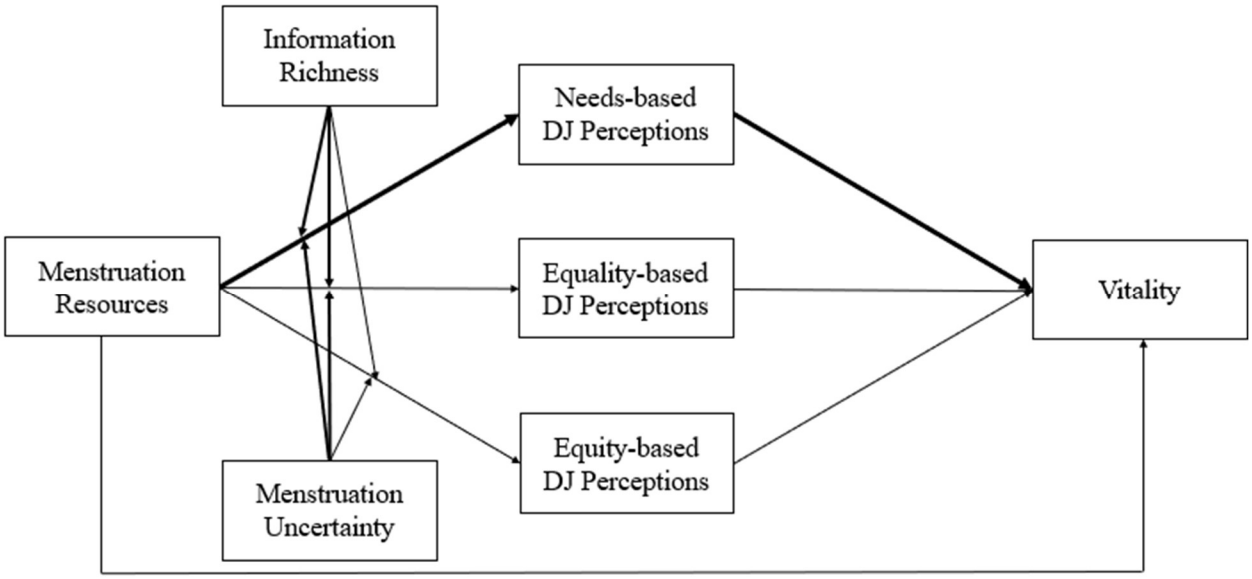
The impact of needs-based resources is especially relevant in the context of this study because menstruating employees have a unique set of symptoms and needs that non-menstruating employees do not have. For example, menstruating women experience unexpected spotting or intermittent bleeding through the menstrual cycle (Astrup et al., 2004), and the severity of menstrual cycle flow is often unpredictable (Yamamoto et al., 2009). However, women are not always prepared to respond to these situations (Barrington et al., 2021). When an organization provides menstruation resources such as menstrual products in employee bathrooms, it helps employees navigate the uncertainties associated with menstruation. Importantly, the provision of menstruation resources is "sponsored by the organization," which requires using a provisional, or needs-based, justice lens to fully understand the impact of these resources (Grandey, 2001, p. 109).

Theory and Hypotheses

In Chapter 3, I suggested that studying menstruation provides critical insight into developing further understanding of distributive justice. Distributive justice research currently depends on a narrow understanding of distributive justice based on equity, but this understanding does not reflect all of the ways organizations allocate resources, such as equality- and needs-based resource distribution. Additionally, early distributive justice theory suggests that distributive justice contexts are constantly changing, but current distributive justice research only explores day to day changes (Matta et al., 2020) rather than naturally occurring changes that impact distributive justice contexts, such as changes associated with the menstrual cycle.

In the section that follows, I first suggest that needs-based menstruation resources are positively related to equity-, equality-, and needs-based justice perceptions because they provide fairness information that informs all distributive justice perceptions, but that this relationship should be strongest for needs- and equality-based justice perceptions when the resources are provided according to need and equality norms. Next, I explore the organization- and individual-level contingency factors that influence the fairness heuristic process. For organization-level contingency factors, I use media richness theory (Daft & Lengel, 1986) to explain how needs-based resource information richness boosts the heuristic process. I then explain how menstruation cultivates an individual context of uncertainty, which increases reliance on fairness signals and strengthens the effect of resources on distributive justice perceptions, especially needs-based distributive justice perceptions. Subsequently, I argue that both the menstruation resources and distributive justice perceptions should be positively related to vitality and propose a conditional indirect effect model. The full theoretical model is depicted in Figure 3.

Figure 3. Empirical Model for Menstruating Employees



Note. Empirical model displays hypothesized relationships between variables. Thick arrows indicate that these paths are expected to be stronger than other paths.

Menstruation needs-based resources and distributive justice perceptions.

The intention of distributive justice is to support individual well-being (Deutsch, 1975), so needs-based menstruation resources should positively impact each principle of distributive justice perceptions. This positive effect is reflected in Hypotheses 1a-c below. However, needs-based menstruation resources are likely to impact needs-based distributive justice perceptions more than equality- or equity-based distributive justice perceptions. When individuals form fairness perceptions, they rely on multiple values – need, equity, and equality (Deutsch, 1975), and individuals assign a weighted value to each principle of distributive justice to form a value-weighted linear combination of distributive justice perceptions (Leventhal, 1976, 1980). If a resource targets one's individual needs, they are likely to assign more weight to the needs-based distributive justice principle than the equity- or equality-based values.

This differentiation in value weights happens because the values that guide perceptions in each of these principles can be at odds with each other (Deutsch, 1975). For example, resources distributed according to need are at odds with those distributed according to equity because the resources are not provided based on performance alone (Grandey, 2001). On the other hand, the differentiation in value weights may reflect two values working in tandem. For example, a needs-based resource like menstrual leave or the option to work from home on menstrual days may not always be available to all employees (Grandey, 2001). Consider a small dentist's office with a limited rotation of employees that can manage the front desk and patient intake. If requests for time off pile up, a manager may be forced to use equity and need norms in tandem to make their resource allocation decisions, and the same effect happens for distributive justice perceptions. Below, I argue that with needs-based menstruation resources, the values that drive equity- and needs-based distributive perceptions are at odds with each other, and the values that drive equality- and needs-based distributive perceptions work in tandem.

First, the weight, or magnitude, of recipients' needs-based distributive perceptions should be strong because allocators' use of a needs-based allocation norm signals that individuals' needs deserve to be supported with the provided resources (Leventhal, 1980). Menstruation resources highlight individual welfare, and as previously noted, individuals assign high weight to the needs rule when evaluating fairness if individual welfare is the primary concern (Leventhal, 1980). Further, the physical symptoms associated with menstruation are likely attributed with an external locus of control because most women recognize that have little control over the timing, frequency, and severity of menstruation symptoms (Rawat et al., 2023), which should also increase fairness evaluations according to needs (Van Hootegem et al., 2020). Indeed, menstruators have no internal control over menstruation onset or severity of symptoms, which

means recipients should demonstrate stronger fairness perceptions associated with provision of needs-based menstruation resources. In sum, needs-based menstruation resources should activate needs-based distributive justice perceptions and demonstrate a strong effect.

However, when organizations provide menstruation resources, the resources deactivate perceptions of equity. The resources deactivate perceptions of equity because in most cases, the resources are provided regardless of individual performance or effort (Grandey, 2001). Consider the recent mandate from the Government of Canada that requires all federal organizations to provide menstrual products in employee bathrooms (CNW Group, 2023). Their rationale for providing menstrual products is that they satisfy a basic health need like toilet paper, reduce the financial burden for those with limited financial resources, and minimize the stigma around periods (Witten, 2023). None of these reasons cite employee performance as a norm used to guide allocation of menstrual resources. Rather, the decisions were made according to equality and needs norms. As such, menstruation needs-based resources should be positively related to equity-based distributive justice perceptions, but this relationship will be weaker than those for equality- and needs-based justice perceptions because equity-based distributive justice perceptions are deactivated in needs-based resources.

The paragraph above suggests that equity-based distributive justice perceptions are at odds with equality- and needs-based justice perceptions when resources are distributed according to need. In contrast to equity-based distributive justice perceptions, equality- and needs-based distributive justice perceptions work in tandem in response to menstruation needs-based resources depending on when allocators' decisions to follow needs and equity distribution norms, as well as individual preferences for equality when circumstances and social risks are unpredictable.

Though there may be instances when menstruation resources are provided unequally (e.g., not provided in all restrooms, flexible work arrangement exclusion), organizations typically provide menstruation resources equally within the group in need. For example, an organization that provides menstrual products in all women's restrooms and single-occupant restrooms provides access to the resource for every menstruating person that may need to use them, thus meeting an equality norm. The new head coach for the U.S. Women's National Soccer Team, Emma Hayes, trains all female athletes according to their menstrual cycle, which helps them avoid career-ending and organizationally impactful injuries (Brennan, 2023). Importantly, each player receives this approach to training, regardless of their level of need or specificity (Brennan, 2023). This approach shows that the training method meets a very specific need of female soccer players, but it is also distributed equally among the menstruating players. Thus, I suggest that, especially when menstruation resources are allocated according to the equality norm, equality- and needs-based distributive justice perceptions should work in tandem and demonstrate stronger effects than the relationship between needs-based resources and equity-based distributive justice perceptions.

Recipients are also likely to demonstrate higher equality-based distributive justice perceptions because resources distributed to support well-being reflect individual's preferences, and therefore values, for both equality- and needs-based distributive justice (Van Hootegem et al., 2020). Later, I argue that menstruation creates a context of uncertainty because the physical symptoms associated with menstruation are unpredictable. When symptoms are unpredictable, equality-based fairness perceptions are stronger because they indicate that individuals will have equal access to support when they need it, even though they cannot always predict when their need will occur (Van Hootegem et al., 2020). Therefore, individuals' equality-based distributive

justice perceptions should be as strong as their needs-based distributive justice perceptions because they work in tandem when individuals form their weighted linear combination (Leventhal, 1980), but both should be stronger than that for equity-based distributive justice perceptions. This difference is reflected in Hypothesis 1d below.

As a caveat, an individual could still place more weight on their needs being met than the fact that the resources were available to all menstruating employees when they form distributive justice perceptions because there are individual differences in the value weights that create the linear combination (Leventhal, 1980). In the women's soccer example above, the level of individualization they receive may activate players' need value more if they have previous ACL injuries or particularly difficult menstrual cycles (e.g., polycystic ovarian syndrome). However, for the purposes of this study, I suggest that because the equality allocation norm is often coupled with the needs norm in menstruation resource allocation, the effect for equality- and needs-based distributive justice perceptions will be stronger than the effect for equity-based distributive justice perceptions.

Hypothesis 1: Menstruation needs-based resources are positively related to a) equity-, b) equality-, and c) needs-based distributive justice perceptions, and d) the positive effect on equality- and needs-based distributive justice perceptions is stronger than that for equity-based distributive justice perceptions.

Distributive justice information richness and heuristics.

On the organization side, the amount of fairness information provided is an organizational contingency factor that influences the fairness heuristic process. In the paragraphs below, I argue that the amount of information provided with menstruation resources also strengthens the effect of resources on distributive justice perceptions, but the hypothesis that

follows does not explicitly suggest a moderating effect because that is not how it is empirically tested. Below, I draw on media richness theory below to explain the heuristic effects of needs-based resource information richness (Daft & Lengel, 1986).

Media richness theory suggests that the amount and richness of information are an important component of organizational communication (Daft & Lengel, 1986). Information richness is defined as "the ability of information to change understanding within a time interval" (Daft & Lengel., 1986, p. 560), and levels of richness are determined according to the communication medium's ability to provide immediate feedback (e.g., face-to-face v. email), the number of cues and channels used, and personalization (Daft & Lengel, 1986). The richness of communication reduces uncertainties regarding the meaning of the information (Daft & Lengel, 1986).

Needs-based resources may be communicated to employees using varying levels of information richness. Here, I argue that amount of fairness information shared with participants in needs-based resource policies impacts the fairness heuristic process, even though policies and procedures are one of the lowest forms of information richness (Daft & Lengel, 1986). The amount of information provided increases heuristic processing in fairness judgements because additional information provides more fairness cues for employees to draw from when they form distributive justice judgements. When individuals have more cues available and accessible, the heuristic effect is stronger than when they have fewer fairness cues available (Tversky & Kahneman, 1973). Thus, the increased availability and accessibility of fairness information cultivated by richer information leads to stronger distributive perceptions due to the heuristic effects (Tversky & Kahneman, 1973; Schwarz & Vaughn, 2002). As such, I suggest that

increased information richness regarding needs-based resources increases the relationship between needs-based resources and distributive justice.

As I previously argued, needs-based resources provide fairness information for all distributive justice perceptions, even if the resources are not allocated according to the corresponding norm. However, when needs- and equality-based allocation norms are used, the heuristic effect on equity-based distributive justice perceptions is weaker than that for equality and need. As such, the hypothesis below reflects a consistent positive effect for all distributive justice perceptions and the strength differences between each principle.

Below, I suggest that when menstruation resources are provided to menstruating employees, the level of information richness increases menstruating employees' distributive justice perceptions. This is reflected in the hypothesis below.

Hypothesis 2: Information richness strengthens the positive effect of menstruation needs-based resources on equality- and needs-based distributive justice perceptions.

The hypothesis above identifies the effect of allocators' pivot points for influencing the fairness heuristic process when they provide needs-based menstruation resources. According to the fairness heuristic model, allocations occur in the pre-formation phase and signal to employees whether they should care about fairness and which distributive justice values are legitimized (Leventhal, 1980), and employees form distributive justice perceptions associated with those fairness signals during the formation phase (van den Bos et al., 2001). Building on this framework, uncertainty management theory of fairness suggests that the pre-formation phase and its effects are especially susceptible to contexts of uncertainty (Lind and van den Bos, 2002). The effects of resources distributed during the pre-formation phase are especially susceptible to uncertainty contexts because fairness perceptions rely on heuristic processing (van den Bos et al.,

2001), and the effects of heuristic processing are stronger when individuals are in an uncertain context (van den Bos, 2001). Below, I argue that menstruation creates a context of uncertainty among menstruating employees, and that when employees are menstruating (versus not menstruating), the positive effects of needs-based resource allocations on distributive justice perceptions are stronger.

First, menstrual cycle length can be unpredictable within women (NIH, 2017), which means it can be difficult to pinpoint the start date of one's upcoming menstruation. This means that women have uncertainty regarding if or when they will start their period, and it could start while they are working. In fact, many women unexpectedly start their period in public and do not have the supplies they need (Rawat et al., 2023). Once started, the most present physical symptom associated with menstruation is menstrual bleeding, which creates a variety of uncertainty factors. The length and severity of menstruation can also be unpredictable, as menstruation ranges 1-14 days and varies within women (Hantsoo, Rangaswamy, et al., 2022; Hardy & Hunter, 2021). At work, menstrual bleeding creates uncertainty because employees may lack control over bathroom breaks. For example, employees that work in manufacturing may take scheduled or limited bathroom breaks, scientists may be working in the field all day with limited bathroom access, or surgeons could be stuck in a long procedure that restricts their ability to get to the bathroom. These situations create uncertainty regarding the likelihood of blood stains or leaks, a focal concern among menstruating employees (Segran, 2016). Beyond the blood, menstruating employees experience dysmenorrhea (Bernardi et al., 2017), fatigue (Ponzo et al, 2022), and irritability (Pierson et al., 2021) as a result of hormone changes. However, the severity, duration, and frequency of these symptoms varies within the day, the menstrual cycle,

and the woman (Schoep et al., 2019). The variation in physical symptoms creates a context of uncertainty during menstruation.

In sum, contexts that highlight uncertainty, like menstruation, cause employees to rely on heuristics more when making judgements about distributive justice (van den Bos et al., 2001). Employees use resource distribution as information when they form distributive justice perceptions (van den Bos et al., 2001), and the uncertainty context amplifies the effect of the information conveyed by needs-based resource distribution because uncertainties cause employees to rely on the information conveyed with needs-based more than they would in a more certain context (Lind and van den Bos, 2002). Thus, menstruation uncertainty should strengthen the positive relationship between needs-based menstruation resources and distributive justice perceptions, and the strength difference for equity-based distributive justice perceptions mirrors Hypothesis 1.

Hypothesis 3: Menstruation uncertainty moderates the effect of needs-based menstruation resources on a) equity-, b) equality-, and c) – needs-based distributive justice perceptions, such that menstruation uncertainty strengthens the positive effect. D) The moderating effect of menstruation uncertainty is stronger for equality- and needs-based distributive justice perceptions than equity-based distributive justice perceptions.

The menstruation resources target: Individual well-being.

Distributive justice involves the distribution of resources to support employee well-being (Deutsch, 1975). Organizations that provide menstruation resources acknowledge they do so to support menstruating employees' health and well-being. In the example raised earlier, the Government of Canada noted that providing tampons is a fundamental health need (Whitten, 2023). But how do menstruation resources impact individual health and well-being? In the

paragraphs that follow, I argue that needs-based menstruation resources impact vitality directly and indirectly via distributive justice perceptions.

Vitality is a relevant work outcome for menstruating employees because menstruation and the menstrual cycle threaten vitality in two key ways. First, over the course of the full menstrual cycle, energy levels change according to hormone level changes. Changes in hormones impact sleep quality (Meers et al., 2024), and this is especially common in the days leading up to and the first days of menstruation (Hantsoo et al., 2022). This reduced sleep quality also impacts productivity at work (Ponzo et al., 2022). Common physical symptoms like recurring menstrual pain can further reduce individuals' sleep quality and energy at work (Baker et al., 1999). Second, the uncertainty associated with menstruation can be cognitively depleting (Barrington et al., 2001). Uncertainty increases mental load and depletion (Alquist et al., 2018), and depletion and vitality are opposing energetic resources (Nix et al., 1999; Tice et al., 2007). In sum, changing hormone levels and uncertainty associated with the menstrual cycle threaten menstruating employees' vitality.

Although menstruation threatens vitality, needs-based menstruation resources should increase menstruating employees' vitality. When organizations provide free menstrual products in bathrooms, they alleviate any mental fatigue associated with extra preparedness for menstruation onset (Sang et al., 2021). When menstruating employees have control over their bathroom breaks, it reduces the mental gymnastics required to appropriately time restroom trips and rumination over possible leaks in the meantime (Rawat et al., 2023). Organizations that provide flexible work arrangements or menstrual leave for employees are particularly helpful for employees that experience cramps during menstruation because it provides employees with the opportunity to create a comfortable workspace and the flexibility to recover comfortably (Levitt

& Barnack-Tavlaris, 2020; Sang et al., 2021), which could reduce their fatigue. Because the purpose of needs-based distributive resource allocations is to satisfy the needs of individual employees (Deutsch, 1975) and the paragraph above demonstrates that vitality is an aspect of well-being that is threatened during menstruation, the hypothesis below indicates that needs-based menstruation resources should be directly positively related to employee vitality.

Hypothesis 4: Needs-based menstruation resources are positively related to vitality.

The hypothesis above suggests a direct effect of menstruation resources on menstruating employees' well-being. However, distributive justice theory and fairness heuristic theory suggests that distributive justice perceptions are a mechanism between resources and well-being outcomes (Deutsch, 1975; van den Bos et al., 2001). Perceptions of fairness are positively associated with well-being (Sparr & Sonnentag, 2008) and personal health (Lucas et al., 2013). Conversely, perceptions of unfairness are associated with decreased well-being (Reb et al., 2019) because injustice is a stressor (Judge & Colquitt, 2004). Therefore, perceived justice should act as an energizing mechanism that increases vitality. As such, the first part of Hypothesis 4 below suggests that all three principles of distributive justice perceptions are positively related to vitality, a particularly relevant well-being outcome for menstruating employees.

Although each principle of distributive justice perceptions should increase vitality, equity- and equality-based distributive justice perceptions should demonstrate a weaker effect on vitality than needs-based distributive justice perceptions. As a note, this strength difference is different from the strength differences presented in Hypotheses 1 and 2 because I do not expect the effect of equality-based distributive justice perceptions on vitality to be as strong as the effect of needs-based distributive justice perceptions on vitality, which I explain below.

Distributive justice perceptions created during the formation phase guide employee outcomes in the post-formation phase (van den Bos et al., 2001). In post-formation outcomes, equity-based distributive justice perceptions increase employee effort if they believe doing so provides access to more resources (Leventhal, 1976). Effort requires energy (Prem et al., 2016), so the effort that is also a by-product of equity-based distributive justice perceptions may reduce the amount of vitality one feels. In the post-formation phase, equality-based distributive justice perceptions engender group cohesion because individuals experience reduced competition for resources (Leventhal, 1976). However, group cohesion is also related to emotional contagion (Barsade, 2002). If the group affect is predominantly positive, menstruating women may engage in emotional labor to match the group's positive affect, which can negatively impact well-being (Lennard et al., 2019). In sum, though the relationship between equity- and equality-based distributive justice perceptions and vitality should be positive, both should demonstrate a reduced positive effect compared to needs-based distributive justice perceptions.

On the other hand, needs-based distributive justice perceptions should increase menstruating women's vitality. Fairness heuristic theory suggests that the principles with the strongest heuristics will lead to the strongest effects (van den Bos et al., 2001). In this case, the provision of needs-based resources for menstruation employees provides the strongest heuristic connection to needs-based distributive justice perceptions because the resources are the most useful and important in satisfying the need value in comparison to equity and equality (Lind and van den Bos, 2002).

Hypothesis 5: A) Equity-, b) equality-, and c) needs-based distributive justice perceptions are positively related to vitality, and d) the positive relationship between needs-based distributive

justice perceptions and vitality is stronger than that between equity- and equality-based distributive justice perceptions.

Finally, the hypotheses above suggest there should be an indirect effect of needs-based menstruation resources on vitality because the resources increase distributive justice perceptions, which in turn, increase vitality. Importantly, this indirect effect also summarizes the full fairness heuristic process (van den Bos et al., 2001). The menstruation resources are indicative of the pre-formation phase, during which employees collect information regarding the organization (van den Bos et al., 2001). The distributive justice perceptions represent the formation phase, the time during which employees form their distributive justice perceptions (van den Bos et al., 2001). Lastly, vitality demonstrates the outcomes associated with the post-formation phase, the stage during which subsequent employee outcomes associated with distributive justice perceptions are evaluated. The full theoretical model in Figure 2 also includes the addition of uncertainty context as a moderator, which provides a full test of distributive justice perceptions and its associated contingency factors. While I would anticipate there to be a conditional indirect effect associated with information richness, information richness is only measured in Study 2, which did not include a vitality outcome. Thus, there is no hypothesized moderated mediation effect for information richness, but the hypothesis below summarizes the full conditional indirect effect associated with menstruation uncertainty.

Hypothesis 6: The positive indirect effect of needs-based menstruation resources on vitality via a) equity-, b) equality-, and c) needs-based distributive justice perceptions is conditional on menstruation uncertainty, such that menstruation uncertainty strengthens the positive indirect effect.

Method and Results

I use two studies to test Hypotheses 1 and 3-6. Study 1 is a longitudinal field study that test the effects of a menstruation resources intervention across multiple menstrual cycles. Study 1 includes a test of the empirical model using menstruation (0 = non-menstruating, 1 = menstruating) as the operationalization for menstruation uncertainty. Then, in Study 2, I operationalize menstruation uncertainty using cycle irregularity. Study 2 uses an experimental approach to manipulate levels of media richness and tests Hypotheses 1-3.

Study 1 method.

Sample and procedure. This study is pre-registered - https://aspredicted.org/1F4_97B. Before the data collection started, all female employees at the organization attended an information session. Employees were informed that a women's health research study would be taking place at the organization because the organization wanted to learn more about how they can support its female employees. Participants were also informed that the study focused on women's menstrual health, though they were not briefed on the study's design or research questions. After the information session, employees were directed to the consent form to indicate their willingness to participate in the study.

The sample for this study comprised of 37 female employees working in the offices of an organization that sells and services green energy products. This organization was an ideal location for this study because most employees in the organization's offices are female. Of these 37 women, 15 reported that their menstruation had ceased due to physiological changes like peri-menopause or pregnancy as well as hormonal contraceptives that eliminate menstruation. As such, these 15 women were excluded from all primary analyses. The final analysis also excludes

women who provided less than 2 surveys. The final sample includes 20 menstruating women. They ranged in age from 22 to 56 (M = 36.91, SD = 9.54) and 96% reported being White.

For 12 consecutive weeks, participants responded to a weekly survey in which they answered questions about their menstruation, distributive justice perceptions, and vitality at work. Participants were directed to respond to the survey at the end of their work week on Friday, or at the beginning of their next work week on Monday when they submitted their weekly timesheets. The data collection lasted 12 weeks to cover the window of two consecutive menstrual cycles, which average 28-35 days in length (Hampson, 2020). Because the data collection started in the middle of many women's menstrual cycles rather than at the beginning of a new menstrual cycle, the 12-week window increased the likelihood of measuring all participants during two full cycles. In total, I captured 51 menstrual cycles within participants (M = 2.22, SD = 1.09) and obtained 198 observations from the 20 employees. Given that the potential number of surveys was 240 (20 participants x 12 surveys), the overall response rate at the observation level was 83%, which is a strong response rate in longitudinal research (Beal, 2015).

Because one of the goals of this study was to assess the role of organizational provision of menstruation resources, this study included an intervention before week seven of surveys. Before week seven, tampons and menstrual pads were added to the organization's bathrooms, and employees were notified by the organization that these supplies were intended to provide support for employees' menstrual health. The supplies were provided for the last six weeks of the study.

Measures. Each week, participants indicated if they had started their period since their last survey. Menstruation was dummy coded, with 1 indicating they started menstruating in the

last five days. This five-day window was then manually validated by cross-referencing their menstruation start date with their survey submission date.

All distributive justice items started with the stem "The menstruation resources provided by [organization]…" and participants indicated their agreement (1 = *strongly disagree*, 5 = *strongly agree*) with each statement.

The items for needs-based distributive justice use items that I developed according to Leventhal's conceptualization of needs-based distributive justice (1976), which follows Colquitt's method for creating equity-based distributive justice perceptions (Colquitt, 2001). The three items included, "are provided to employees who need them," "reflect employee needs," and "are allocated based on employees' individual needs."

For equality-based distributive justice perceptions, participants responded to two items – "are provided consistently among employees" and "are provided free of bias among employees" – from the Colquitt (2001) scale. The four-item procedural justice scale was not used because the intent was not to measure participants' perceptions of the procedure, but rather their perceptions of distributive equality. A third, face-valid equality item was added – "are distributed equally among employees" – to reflect similar items in the needs-based and equity-based scales.

Equity-based distributive justice perceptions were operationalized using four items from Colquitt's (2001) scale for distributive justice, a well-documented aspect of equity-based allocations (Deutsch, 1975). The four items included "reflect the effort I put into my work," "are appropriate for the work I have completed," "reflect what I have contributed to the organization," and "are justified, given my performance."

Vitality was measured using three items from the subjective vitality scale (Bostic et al., 2000). Participants indicate the extent to which they felt "alive and vital," "alert and awake," and "energized" (1 = *to a very small extent/not at all,* 5 = *to a very large extent*).

Analytic approach. Observations are nested within participants, so I used multilevel path analysis in Mplus 8 (Muthén & Muthén, 2017) to simultaneously test the hypotheses. Before conducting the analysis, I used a null model to establish an acceptable level of within-person variance on the mediators and dependent variable. Each outcome indicated a sizable portion of variance existed at the within-person level: vitality (58.9%); equity- (45.3%), equality- (78.8%), needs-based distributive justice perceptions (80.2%). As such, the mediators are group-mean centered at the individual level mean, so the coefficients reported in the results represent within-person differences (Enders & Tofighi, 2007). The categorical predictors for menstruation resources (99.9%) and menstruation uncertainty (99.9%) demonstrated almost no between-person variance. As such, menstruation resources (0 = no resources, 1 = resources) and menstruation uncertainty (0 = not menstruating, 1 = menstruating) were left uncentered (Podsakoff et al., 2019). The "d" hypotheses for strength differences are calculated using the model constraint command in Mplus, which employs a Wald's test for differences (Muthén & Muthén, 2017). I report simple slopes for the moderation effect, and indirect effects are tested using 20,000 bootstrap replications, which creates a 95% confidence interval around the indirect effects. No control variables were included in the analysis due to sample size constraints. The coefficients for the full empirical model are standardized.

Because the Level-2 sample size is rather small ($N = 20$), and there is only 1 degree of freedom in the model, I conducted post-hoc power analysis to assess interpretability of the standardized regression coefficients from the model (Faul et al., 2007). Post-hoc power analysis

indicates that coefficients must exceed γ = .73 to achieve an effect size with power = .80. The results indicate that no coefficients exceed this cutoff, which suggests the following results should be interpreted cautiously (Button et al., 2013; Ioannidis, 2005). I discuss this issue further in the limitation section.

Study 1 results.

Table 1. Descriptive Statistics – Study 1

	Mean	***SD***	**1**	**2**	**3**	**4**	**5**	**6**
1. Menstruation resources	0.43	0.49		.27	.27	.26	.70*	-.39
2. Needs-based DJ perceptions	2.71	1.11	.48*	(.92)	.88*	.66*	.40	-.68*
3. Equality-based DJ perceptions	2.92	1.23	.55*	.73*	(.96)	.35	.54*	-.61*
4. Equity-based DJ perceptions	2.83	0.78	.22*	.40*	.32*	(.98)	-.08	-.13
5. Vitality	3.00	0.77	.23*	.06	.15*	.08	(.94)	-.77*
6. Menstruation Uncertainty	0.27	0.43	.09	.12	.06	.08	-.03	

Note. Level-2 $N = 20$, Level-1 $n = 198$. Reliabilities are averaged across survey in parentheses across the diagonal. Within-person correlations are below the diagonal and between-person correlations are above the diagonal *SD* = standard deviation.
*$p < .05$

All means, standard deviations, and reliability coefficients are reported in Table 1, and the results for the Study 1 model are summarized in Table 2. Hypothesis 1 suggests that the effect of menstruation needs-based resources on equality- and needs-based distributive justice perceptions is stronger than that on equity-based distributive justice perceptions. Results indicate that menstruation resources are significantly positively related to needs-based ($\gamma = .47$, $p < .001$), equality-based ($\gamma = .52$, $p < .001$), and equity-based distributive justice perceptions ($\gamma = .17$, $p = .04$). The results indicate that the strength difference between equity-based distributive justice

perceptions and needs-based (γ = .31, *p* = .002) and equality-based distributive justice perceptions (γ = .36, *p* = .001) are significant and positive, which means that the effect of needs-based resources is strongest for needs- and equality-based distributive justice perceptions. Thus, Hypotheses 1 was supported.

Table 2. Study 1 - Empirical Model Results

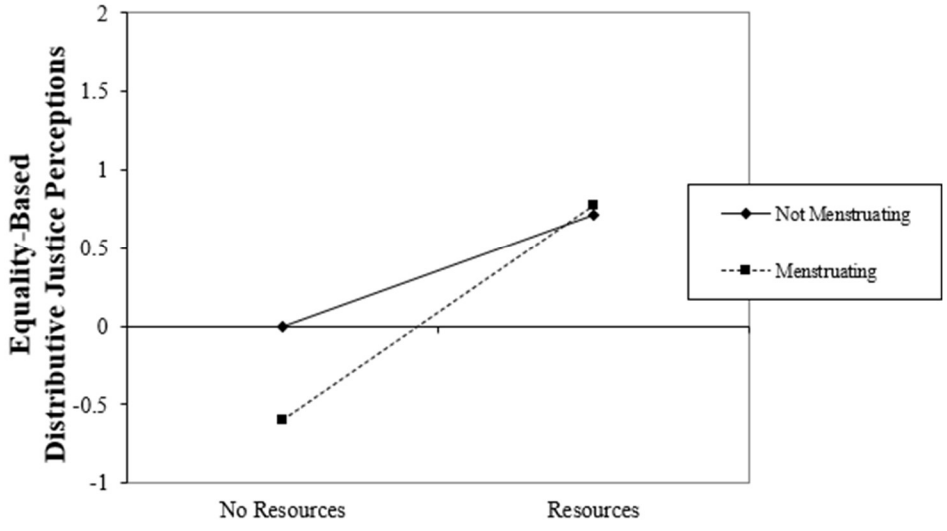
	Needs	**Equality**	**Equity**	**Vitality**
Predictor	γ (*SE*)	γ (*SE*)	γ (*SE*)	γ (*SE*)
Menstruation resources	.47*** [a] (.12)	.52*** [a] (.11)	.17* (.08)	.37** (.12)
Menstruation uncertainty	-.42* [a] (.40)	-.44** [a] (.18)	.05 (.19)	
Resources × Menstruation uncertainty	.40 [a] (.24)	.48* (.23)	-.08 (.28)	
Needs-based DJ perceptions				-.14 (.10)
Equality-based DJ perceptions				.10 (.10)
Equity-based DJ perceptions				.06 (.06)
Indirect effects				Est. [LCI, UCI]
via Needs				-.057 [-.163, .050]
via Equality				.048 [-.065, .016]
via Equity				-.010 [-.040, .031]

Note. Level-2 *N* = 20, Level-1 *n* = 198. [a] = significant difference from equity-based distributive justice perceptions. LCI = lower confidence interval; UCI = upper confidence interval. Indirect effect CI's = 95% bootstrapped (20,000). Standardized effects are reported in the table.
*$p < .05$
**$p < .01$
***$p < .001$

Hypothesis 3 posited that the interaction of menstruation uncertainty and needs-based resources on distributive justice perceptions is strongest for needs- and equality-based distributive justice perceptions. The results indicate that the interaction is significantly positive for equality-based distributive justice perceptions (γ = .48, *p* = .04), which provides support for

Hypothesis 3b. The interaction of menstruation uncertainty and resources on equality-based perceptions is plotted in Figure 4. Simple slopes analysis indicates that the slope for low menstruation uncertainty ($\gamma = .52$, $t = 3.55$, $p < .01$) is weaker than the slope for high menstruation uncertainty ($\gamma = 1.00$, $t = 2.59$, $p = .01$). The interaction is not significant for needs-based perceptions ($\gamma = .50$, $p = .099$) and is not significant for equity-based distributive perceptions ($\gamma = -.08$, $p = .79$), so Hypotheses 3a and 3c were not supported. For equality-based distributive justice perceptions, simple slopes analysis indicates that the resources slope is stronger when women are menstruating ($\gamma = 1.37$, $p < .001$) compared to when they are not ($\gamma = .71$, $p < .001$). Further compared to the moderating effect of menstruation uncertainty on the relationship between menstruation resources and equity-based distributive justice perceptions, needs-based ($\gamma = .48$, $p = .01$) distributive justice perceptions are stronger than equity-based distributive justice perceptions, but and equality-based ($\gamma = .74$, $p = .049$) distributive justice perceptions are not significantly different. Thus, Hypothesis 3d was partially supported.

Figure 4. Study 1- Interaction of Menstruation Uncertainty and Resources on Equality-Based Distributive Justice Perceptions



In support for H4, needs-based menstruation resources are directly and positively related to vitality ($\gamma = -.37$, $p < .01$). Hypothesis 5, regarding the effect of distributive justice perceptions on vitality, was not supported. Equity-based ($\gamma = .06$, $p = .05$), equality-based ($\gamma = .10$, $p = .32$), and needs-based ($\gamma = -.14$, $p = .17$) distributive justice perceptions are not significantly related to vitality. Thus, Hypotheses 5a-d are not supported. Because these relationships were not significant, the conditional indirect effects between menstruation resources and equity-based (IE = -.010, 95% CI [-.040, .031]), equality-based (IE. = .057, 95% CI [-.163, .050]), and needs-based (IE. = -.048, 95% CI [-.065, .016]) distributive justice perceptions are also not significant, indicated by the confidence intervals containing zero. As such, the conditional indirect effects in Hypothesis 6 are also not supported.

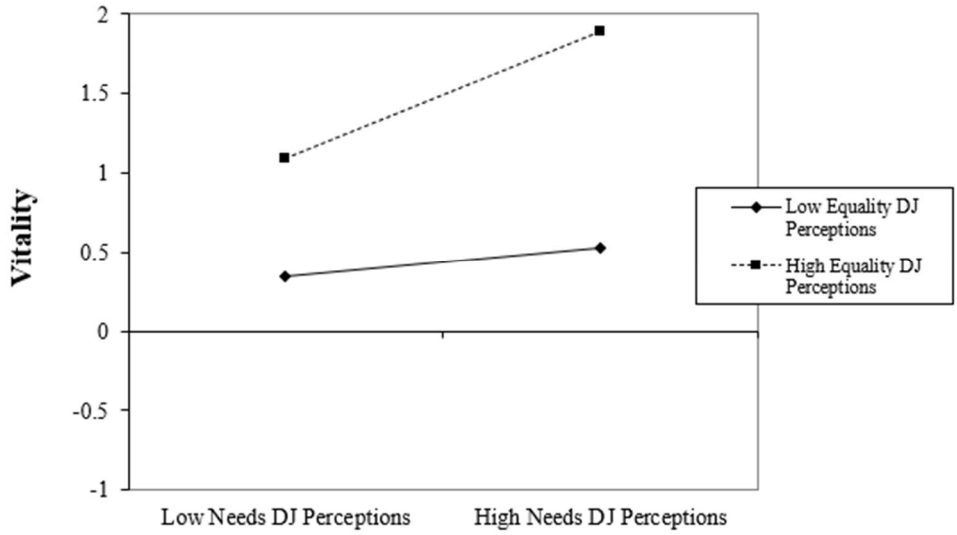
Study 1 supplemental analyses.

In addition to the analyses completed above, there may be some concern about the use of two items from the procedural justice sub-scale (Colquitt, 2001) to measure equality-based distributive justice. As such, I ran the full empirical model using a single-item measure of equality-based distributive justice that only includes the item that reads "are distributed equally among employees." The results were largely the same, as the effect of menstruation resources ($\gamma = .50$, $p < .001$) and the menstruation resources by menstruation uncertainty interaction ($\gamma = .55$, $p = .03$) were both positive and significant. Additionally, the effect of equality-based distributive justice perceptions on vitality remained non-significant ($\gamma = .05$, $p = .60$).

Because the measure for equity-based distributive justice uses the distributive justice scale and the measure for equality-based distributive justice uses items from the procedural justice scale, prior research regarding the interaction of these two dimensions may provide insight into the lack of effects between distributive justice perceptions and vitality demonstrated

in the empirical model. Prior research indicates that procedural justice and distributive justice interact (De Cremer, 2005), which suggests that some of the non-significant effects of distributive justice perceptions in the emprical model may be due to a higher-order effect of an interaction. As such, I ran a similar model in which I created three interaction terms – needs x equality, needs x equity, and equality x equity as predictors for vitality. The model also included main effects and the effect of menstruation resources. In this model, menstruation resources are still positively related to vitality ($\gamma = .40$, $p < .001$), but there is only an interaction effect of needs x equality-based distributive justice perceptions on vitality ($\gamma = .11$, $p = .04$). Simple slopes analysis indicates that the simple slope for low equality-based distributive justice perceptions is not significant ($\gamma = .05$, $p = .60$), while the slope for high equality-based distributive justice perceptions is significant ($\gamma = .05$, $p = .60$). The interaction is plotted in Figure 5 below. Additionally, I accounted for the possibility of a three-way interaction between needs-, equality-, and equity-based distributive justice perceptions on vitality, and the three-way interaction was not significant ($\gamma = -.02$, $p = .67$). Therefore, the supplemental analyses indicate that the three principles for equity-, equality-, and needs-based distributive justice principles do not interact in the way distributive and procedural justice do.

Figure 5. The interaction of needs- and equality-based distributive justice perceptions on vitality.



Note. Simple slopes are graphed at +/- 1 standard deviation for equality-based distributive justice perceptions.

Study 1 discussion.

The Study 1 results demonstrate that among menstruating employees, needs-based menstruation resources increase equity-, equality-, and needs-based distributive justice perceptions, and that this effect is weakest for equity-based distributive justice perceptions. This aligns with the perspective that when resources are distributed according to need and equality norms, distributive need- and equality-based distributive justice perceptions increase.

The results also provide support that menstruation is an uncertainty context that strengthens the effect of menstruation resources on equality- and needs-based distributive justice perceptions. These results align with uncertainty management theory of fairness (Lind & van den Bos, 2002), and provide support for the argument that menstruation creates uncertainty among employees, which increases their reliance on needs-based resources.

Finally, these results also demonstrate that although needs-based menstruation resources increase vitality, the effect is not mediated by distributive justice perceptions. This aligns with

distributive justice theory more broadly, which suggests that goods are provided to support individual well-being (Deutsch, 1975). However, these results do not provide evidence for the predictive effect of distributive justice linear combination created according to value weights on post-formation employee outcomes (Leventhal, 1980; van den Bos et al., 2001).

The main limitation of Study 1 is that the Level-2 sample size is rather small with 20 individuals, though the sample consists of many Level-1 observations (n = 198). I discuss this limitation further in Chapter 5, but one purpose of Study 2 was to address the sample size limitations in Study 1 with a larger sample. Thus, one goal of Study 2 below is to provide additional evidence for the left side of the empirical model using a higher-powered sample with more observations. The sample in Study 2 also reflects a broader sample of working individuals from many organizations and industries.

An additional limitation of Study 1 is that the sample is limited to individuals within one organization, so the results may be due to an unmeasured organizational variable. Further, the design of Study 1 limits interpretation regarding the effect of menstruation resources specifically. For example, these effects could have been driven by the provision of any resources rather than menstruation resources. Finally, Study 1 also does not explore the information richness facet of distributive justice allocations because all participants experienced the same level of information richness with the menstruation needs-based resources. Study 2 addresses the limitations from Study 1 by experimentally manipulating type of benefits provided by an organization and information richness surrounding the benefits. Study 2 tests Hypotheses 1-3.

Study 2 method.

Sample. 243 full-time working women were recruited via Prolific. Participants included women who are currently menstruating (e.g., menstruation did not cease due to peri-menopause),

so 14 participants were eliminated from the final sample because they indicated they no longer have a period. The final sample included 205 participants who ranged from 18-40 years in age (M = 29.13, SD = 5.37). 54.47% of participants identified as White, 28.94% as Black, 8.09% as mixed race, 3.83% as Asian, and 4.68% of participants chose not to answer.

Participants were removed from the sample if they did not pass the attention check (n = 24). The attention check was a two-minute writing task, and participants were removed if the total number of characters included in a participant's response exceeded more than -1 SD. Thus, the final sample consisted of 205 participants (control n =40, resources only n = 52, messaging only n = 51, and resources plus message n = 62).

Design. Upon indicating consent, participants responded to questions regarding their menstrual cycle symptoms. Then participants were introduced to the manipulation and were instructed to review "benefits information from a competitive job offer at DropWorks." See Appendix A in the supplemental materials for the benefits materials for each condition.

This study used four conditions that map on the information richness hypothesis. First, the *control* condition listed 19 benefits typically found in employee benefits packages, such as options for enrollment in vision coverage, 401k matching, and 12 days of vacation. The control condition was included to validate that menstruation resources, rather than resources alone, influences distributive justice perceptions. The menstruation *messaging only* condition contained a paragraph that noted menstrual products are provided in all restrooms because "pads and tampons are a basic and constant hygienic need." This condition is the condition with the lowest level (Tier 1) of richness because it contains the least amount of information about the actual menstruation benefits. While it explains why the organization provides menstruation benefits, it does not provide a comprehensive list of menstruation resources. In the menstruation *resources*

only condition, participants were shown "additional benefits for menstruating employees" that included "hybrid schedules for employees experiencing acute (daily) or long-term health issues related to the menstrual cycle" and "ability to schedule own breaks for employees with customer-facing responsibilities." The menstruation *resources only* condition did not contain any additional explanation regarding these benefits. The *resources only* condition is the second tier of information richness because it provides a comprehensive list of menstruation benefits, which provides additional fairness signals in comparison to those in Tier 1. The menstruation *resources plus messaging* condition showed the benefits from the menstruation resources only condition and the message from the menstruation messaging only condition. This condition represents the highest level (Tier 3) of information richness because it contains a comprehensive list of benefits as well as an explanation as to why the organization provides the benefits. This condition provides multiple fairness signals and multiple points of explanation to participants. Importantly, the number of benefits remained constant in conditions across conditions that contained benefits.

Manipulation check. In the manipulation check, participants were given a list of employee menstruation resources and were asked to identify if DropWorks provided those resources based on the benefits information they received, and their score is the number of items selected. The manipulation is successful first if each condition is significantly different from control, and second, if the value increases as information richness increases with each condition. The manipulation check indicates the vignettes worked, F (3, 205) = 87.94, $p < .001$. Compared to participants in the control condition ($M = 2.33$, $SD = .67$), participants in the *resources only* condition ($M = 2.60$, $SD = .59$; $t(205) = 1.27$, $p < .011$) and the menstruation *resources plus messaging* condition ($M = 2.65$, $SD = .58$; $t(205) = 1.32$, $p < .001$) indicated that DropWorks provides more menstruation resources. The *messaging only* condition is not significantly

different from the *control* condition (M = 1.41, SD = .49; $t(205) = .07$, $p = .55$). However, participants in the *messaging only* condition indicated DropWorks provides significantly fewer menstruation resources than the *resources only* ($t(205) = -1.20$, $p < .001$) and the *resources plus messaging* conditions ($t(205) = -1.25$, $p < .001$).

After the manipulation check, participants responded to questions regarding their distributive justice perceptions. The scales for the three principles of distributive justice perceptions (Colquitt, 2001; Leventhal, 1976) are the same as those used in Study 1. Menstruation uncertainty was measured by asking participants to indicate their regularity of their menstrual cycle (*1* = extremely regular (no more than 1-2 days after expected); *3* = usually irregular).

Analysis. I tested Hypotheses 1-3 using structural equation modeling (SEM) in R with the `lavaan` package, and the difference estimates for difference hypotheses are calculated using a Wald test. Before estimating the hypothesized model, I performed confirmatory factor analysis for the latent variables in the analysis. The hypothesized model demonstrated good fit, $\chi^2(181) = 126.92$, TLI = .94, CFI = .96, RMSEA = .085, and SRMR = .05 (Hu & Bentler, 1999). Though the TLI and RMSEA exceed typical cutoffs, a combination of CFI > .96 and SRMR < .09 is suitable (Hu & Bentler, 1999). Additionally, all factor loadings were significant at $p < .001$. Further, this model demonstrated better fit ($\Delta \chi^2(5) = 324.90$, $p < .001$) than the model that loaded all distributive justice perceptions onto one latent factor, $\chi^2(176) = 451.82$, TLI = .79, CFI = .74, RMSEA = .18, and SRMR = .08 (Hu & Bentler, 1999). As such, I proceeded with analysis as planned.

To ensure the robustness of the indirect effects, bootstrapping was applied with 20,000 iterations. Because there are four menstruation resources condition, the conditions were dummy

coded using the control group as the referent group. This means that coefficient estimates for condition are for that condition compared to the control group, and coefficients are standardized.

Additionally, post-hoc power analysis using G*Power indicates a sample size of 205 has power > .99 for even the smallest effect size ($f^2 = 1.02$), which I calculated using the variance explained (R^2) in equity-based distributive justice perceptions in the full SEM model (Faul et al., 2007). These results indicate that the Study 2 sample size and model specification provide sufficient power to detect the hypothesized relationships, which supports the robustness of the findings.

Table 3. Study 2 Descriptive Statistics

	Mean	***SD***	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1. Messaging	0.25	0.43							
2. Resources	0.24	0.43	-.32*						
3. Resources + messaging	0.31	0.47	-.37*	-.37*					
4. Menstruation uncertainty	1.79	0.81	.05	-.12	.03				
5. Needs-based DJ perceptions	4.22	0.88	.09	.21*	.35*	-.01	(.89)		
6. Equality-based DJ perceptions	4.12	0.97	.15*	.12	.27*	-.01	.67*	(.91)	
7. Equity-based DJ perceptions	3.66	1.08	-.02	.14*	.27*	-.06	.65*	.51*	(.90)

Note. N = 205. Reliabilities are reported in parentheses across the diagonal. *SD* = standard deviation. DJ = Distributive justice.
*$p < .05$

Study 2 results.

Table 3 contains the means, standard deviations, and correlations for Study 2 variables. Table 4 contains a summary of the Study 2 results. The coefficients for each condition are in comparison to the control condition, but I also report pairwise differences between condition. Hypothesis 1 posited and Study 1 demonstrated that the effect of menstruation needs-based

resources on needs- and equality-based distributive justice perceptions is stronger than the effect of needs-based resources on equity-based distributive justice perceptions. In this study, because there are three conditions for menstruation needs-based resources, the results should indicate a positive effect that increases according to information richness and is stronger for needs- and equality-based distributive justice perceptions than equity-based perceptions. Because the effects for equality mainly lie in the interaction between condition and menstruation uncertainty, I wait to discuss those in the Hypothesis 3 results below and focus on the main effect differences between needs-based and equity-based distributive justice perceptions here for Hypothesis 1.

Table 4. Effect of Menstruation Resources Condition on Distributive Justice Perceptions

Predictor	**Needs-based DJ perceptions** β (*SE*)	**Equality DJ perceptions** β (*SE*)	**Equity DJ perceptions** β (*SE*)
Messaging only	1.77*** (.43) [a]	.71 (.50)	.64 (.54)
Resources only	1.73*** (.41) [a]	.18 (.48)	.77 (.52)
Resources + messaging	2.07*** (.46)	.64 (.54)	1.21* (.59)
Menstruation uncertainty	.07 (.16)	-.39* (.19)	-.17 (.21)
Interactions (× Uncertainty)			
Messaging only	-.14 (.21)	.35 (.25)	.09 (.27)
Resources only	.01 (.21)	.64** (.25)	.19 (.27)
Resources + messaging	-.08 (.24)	.48 (.28)	.02 (.30)

Note. $N = 205$. Coefficients are standardized. [a] = significantly different from equity-based distributive justice perceptions.

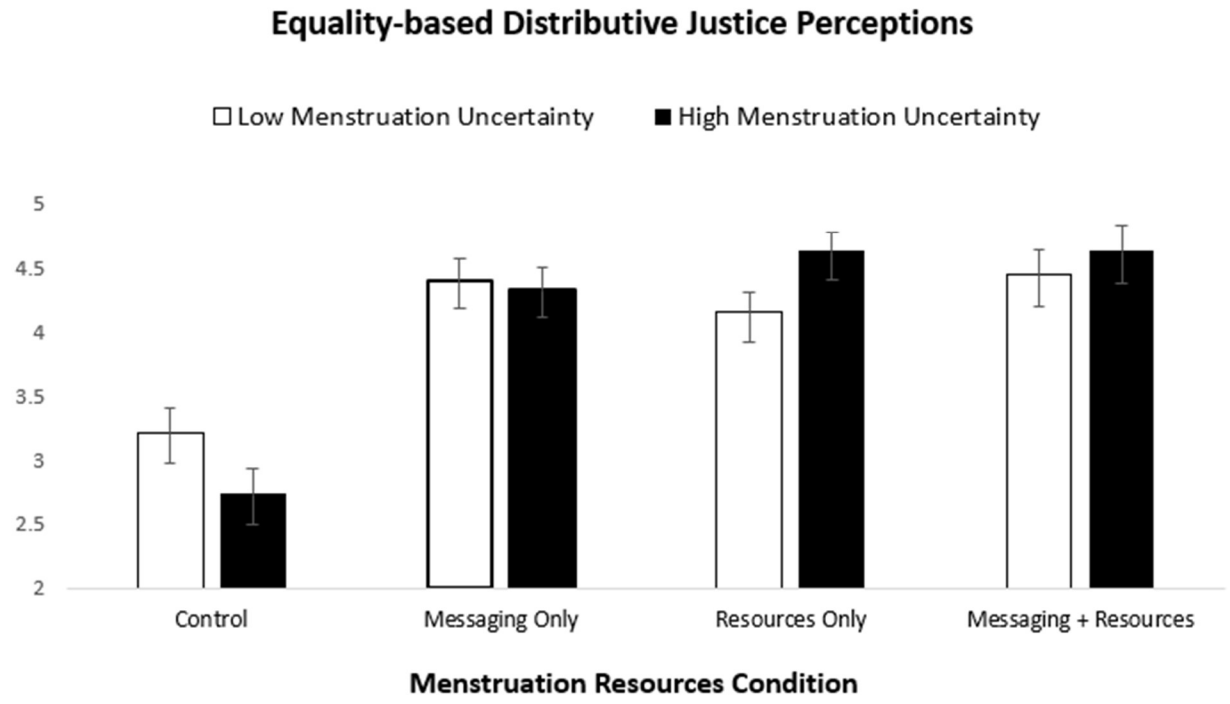
In partial support of H1a and in comparisons to the control condition, only resources communicated via *resources plus messaging* were positively related to equity-based distributive justice perceptions (β = 1. 21, $p = .04$). For equality-based distributive justice perceptions, the *messaging only* (β = .68, $p = .16$), *resources only* (β = .13, $p = .80$), and *resources plus messaging* (β = .61, $p = .24$) conditions were not significantly related to equality-based distributive justice perceptions, though this is likely driven by the significant interaction effect with menstruation uncertainty, which is discussed in Hypothesis 3. Hypothesis 1b was not

supported. In contrast, menstruation resources communicated via *messaging only* ($\beta = 1.77$, $p < .001$), *resources only* ($\beta = 1.73$, $p < .001$), and *resources plus messaging* ($\beta = 2.07$, $p < .001$) were positively related to needs-based distributive justice perceptions. Hypothesis 1c was supported. In partial support of Hypothesis 1d, the effect of the menstruation resources communicated via the *messaging only* condition on needs-based distributive justice perceptions was stronger than the effect of *messaging only* on equity-based distributive justice perceptions, $t(205) = 1.13$, $p = .01$), and the *resources only* condition demonstrated similarly significant differences, $t(205) = .98$, $p = .046$). However, the *resources plus messaging* conditions indicated no significant difference in effects between needs- and equity-based distributive justice resources, $t(205) = .86$, $p = .09$). Additionally, due to the non-significant main effects among equality-based distributive justice perceptions, the condition effects were not significantly different between equality- and equity-based distributive justice perceptions. Therefore, Hypothesis 1d is only partially supported.

Hypothesis 2 suggests that as information richness increases between conditions, the effect should increase in magnitude for equality- and needs-based distributive justice perceptions. Support for this hypothesis is indicated by significant pairwise differences between conditions within each principle of distributive justice perceptions. However, within each principle of distributive justice perceptions, the perceptions did not differ according to condition, so H2 was not supported. For needs-based distributive justice perceptions, the effect of the *resources only* condition was not stronger than the *messaging only* condition $t(205) = -.04$, $p = .92$), and the effect of the *resources plus messaging* condition was not stronger compared to *resources only* $t(205) = .31$, $p = .43$) and *messaging only* $t(205) = .27$, $p = .47$) conditions. Similarly, among equality-based distributive justice perceptions, the effect of the *resources only*

condition was not stronger than the *messaging only* condition $t(205) = -.56$, $p = .21$), and the effect of the *resources plus messaging* condition was not stronger compared to *resources only* $t(205) = .49$, $p = .32$) and *messaging only* $t(205) = .07$, $p = .88$) conditions. Thus, Hypothesis 6 is not supported. Hypothesis 3 regards the moderating effect of menstruation uncertainty. Because this study uses an experimental design, I included an interaction term for each condition by menstruation uncertainty, and the reported coefficients are the condition in comparison to the control group. The results indicate that the only significant interaction with menstruation occurs in the *resources only* condition predicting equality-based distributive justice perceptions ($\beta = .64$, $p = .02$). In the resources only condition, simple slopes at +/- 1 *SD* for menstruation uncertainty indicates that the slope for low uncertainty ($\beta = -.55$, $t = -.73$, $p = .47$) is not significant, but the simple slope for high uncertainty ($\beta = .74$, $t = 2.63$, $p = .01$). These results indicate that effect of resources on equality-based distributive justice perceptions is stronger when women have high menstruation uncertainty in the resources only condition. Thus, Hypothesis 3 was partially supported for the interaction effect on equality-based distributive justice perceptions, but not fully supported because the interaction effect was not significant for needs-based distributive justice perceptions or equity-based distributive justice perceptions. Figure 5 contains a graph of the moderating effect of menstruation uncertainty by condition on equality-based distributive justice perceptions.

Figure 5. Study 2 - The Moderating Effect of Menstruation Uncertainty on Equality-Based Distributive Justice Perceptions Across Condition



Study 2 discussion.

The results from Study 2 provide additional support for Hypotheses 1 and 3, which suggest that the effects of providing needs-based menstruation resources should be strongest for needs- and equality-based distributive justice perceptions than for equity-based distributive justice perceptions. The results from Study 2 also provide partial support for the effect of information richness on distributive-justice perceptions because the effects for needs- and equity-based distributive justice perceptions were strongest in the *resources plus messaging* condition, which contained the most information richness. Additionally, the moderating effect of menstruation uncertainty is only significant in the resources and resources plus messaging conditions, which also provides some tentative support for media richness.

Study 2 supplemental analyses.

As with Study 1, I also ran the full empirical model using a 1-item indicator of equality-based distributive justice perceptions rather than the 3-item scale that includes items from the procedural justice subscale (Colquitt, 2001). The results for the 1-item indicator are similar to those with the 3-item indicator, such that the effect of the *messaging only* ($\beta = .64$, $p = .24$), *resources only* ($\beta = .74$, $p = .18$), and *resources plus messaging* conditions ($\beta = 1.21$, $p = .04$) on the 1-item indicator resemble the effects of each condition using the 3-item scale.

The full rationale and results for further supplemental analyses are provided in Appendix B. Of note, the supplemental analyses in Appendix B indicate that when distributive justice perceptions are removed from the model, vitality mediates the effect of menstruation needs-based resources on menstruating employees' performance (IE = .02, 95% CI [.004, .036]). These results indicate that menstruation resources positively impact employee performance, which is an important outcome for organizations to consider when deciding whether or not to provide menstruation resources. I discuss the implications for these results in the general discussion.

Additional supplemental analyses cover hypotheses from the original dissertation proposal regarding self-determination needs for belonging, competence, and autonomy, as well as self-determination need-supplies fit predicting distributive justice perceptions. These analyses do not provide much additional information to the theoretical and empirical models tested here, so they are not discussed in the general discussion.

In the chapter that follows, the general discussion addresses the theoretical and practical implications of these results. In doing so, I demonstrate how this study contributes to distributive justice and working women's health research. I then discuss the study's limitations, and I contemplate questions for future research. Finally, the chapter closes with a brief conclusion.

CHAPTER FIVE - CONCLUSION

Overall, the purpose of this dissertation was to use the work experiences associated with menstruation, maternity, and menopause to provide critical insight into the needs and equality principles in distributive justice research. As such, one purpose of this dissertation was to demonstrate that equity-based distributive justice perceptions are not sufficient for understanding all resource allocation norms. Empirically, the purpose of this dissertation was to draw on best practices in menstruation research to identify both individual- and organization-level factors that influence how employees form distributive justice perceptions according to the fairness heuristic process. The empirical studies were designed to demonstrate that menstruation is an individual-level contingency factor that creates a context of uncertainty, which increases the salience of fairness signals (i.e., needs-based resources). The purpose of Study 2 was to demonstrate that information richness is an organization-level contingency factor that increases the salience of fairness signals. Lastly, the overarching theoretical and empirical goal of this dissertation was to demonstrate that providing needs-based resources for menstrual, maternal, and menopausal employees elevates employees' well-being, which is as stake during menstruation, maternity, and menopause. In the following paragraphs, I identify the insights provided by the results and then discuss the theoretical and practical implications of the results.

The first insight the results provide is that needs-based menstruation resources are positively related to both needs- and equality-based distributive justice perceptions, and the impact of these resources is stronger when employees are menstruating compared to when they are not menstruating because menstruation creates a context of uncertainty. Importantly, the results also demonstrate that fairness perceptions are lowest when women are menstruating and no menstruation resources are provided. Thus, when women have high uncertainty but no

menstruation resources, their distributive justice perceptions decrease. The second key insight is that rather than distributive justice perceptions, menstruation resources alone are associated with an increase in employee vitality. While this provides promising evidence as to the effect of menstruation needs-based resources, it does not provide strong evidence that a change in perceptions are the driving mechanism between needs-based resources and vitality. Finally, the results from Study 2 provide additional support for Study 1 because needs-based resources in every condition were positively related to needs-based distributive justice perceptions, and uncertainty strengthened the positive effect of condition on equality-based distributive justice perceptions. Study 2 also provides insight into the messaging regarding needs-based resources because the effect of menstruation resources on distributive justice perceptions was stronger as conditions increased in information richness.

Taken together, these studies provide support for the hypotheses regarding the antecedents of distributive justice perceptions. Further, these results indicate that menstruation resources, which are distributed according to need, influence employees' values for need and equality more than they affect employees' value for equity. These results demonstrate that equity-based distributive justice perceptions do not adequately develop our understanding of distributive justice perceptions according to needs-based allocation norms. The results also provide more information regarding how needs- and equality-based distributive justice perceptions work in tandem. The implications for the study results are discussed below.

Theoretical implications.

Menstruation research. First, this study contributes to the growing body of women's health research (Grandey et al., 2020), and menstruation research specifically (e.g., Werner et al., 2023; Meers et al., 2024). The results of these studies demonstrate that the physical experience of

menstruation creates uncertainty, and that this uncertainty increases distributive justice perceptions associated with menstruation resources. I operationalized menstruation uncertainty in two ways, menstruation v. non-menstruation weeks and menstrual cycle regularity, and both operationalizations of uncertainty strengthens the effect of needs-based resources on needs- and equality-based distributive justice perceptions. Because these results align with the hypotheses, they affirm that the menstruation resources were important and the context was uncertain, two key components of increased justice perceptions (Lind and van den Bos, 2002). As such, these studies open the empirical conversation regarding needs-based justice at work (Grandey, 2001) and provide implications for other women's health and work research.

Understanding the effects of uncertainty in the menstruation context may aid in understanding the effect of uncertainty in other women's health contexts, such as maternity or menopause. Managing uncertainty is a critical component of the menopausal employee's experience, as menopausal employees experience unpredictability in timing, frequency, and length of hot flashes (Hardy et al., 2018), and they face uncertainty regarding their ability to control these symptoms at work (Kittell et al., 1998). Thus, if needs-based menopause resources are provided to menopausal employees (e.g., fans, flexible meeting times) that aid in reducing uncertainty, menopausal employees, too, should experience increased fairness perceptions, vitality, and performance. In the section below, I explain how my theorizing and results can be applied to maternity and menopause.

Understanding the effects of uncertainty in the menstruation context provides more insight into the stigma of women's health, a key area of women's health and work research (e.g., Gloor et al., 2018; Werner et al., 2023; Whiley et al., 2023). Employees with invisible stigmas (e.g., menstruation, early pregnancy, menopause) are more likely to face uncertainty regarding

how their group is perceived (Clair et al., 2005). When an identity is stigmatized, employees face group threats and ostracization (Pachankis et al., 2018), and group identity threats of exclusion increase uncertainty and thereby increase reliance on fairness perceptions (van den Bos et al., 1998). I hypothesized and the results demonstrated that the uncertainty associated with menstruation strengthens the effect of needs-based resources on needs- and equality-based distributive justice perceptions. These results suggest that when employees who are stigmatized for their menstruation, maternity, or menopause are provided with menstruation resources, they will have higher distributive justice perceptions. These higher distributive justice perceptions, especially equality-based distributive justice perceptions, should in turn reduce the threat of ostracization and increase feelings of inclusion as well as employees' health (Leventhal, 1976; Liang et al., 2022). Thus, the results regarding uncertainty in this study have implications for the understanding of stigma in other groups. In summary, this study contributes to the research on stigma of women's health at work by providing evidence for a needs-based intervention that could alleviate the reproductive stigma experience among working women.

Lastly, this study demonstrates that the challenges associated with studying menstruation can be leveraged to build management theory. One strength of this study is that it ties the complexities of distributive justice theory with the complexities of menstruation research. As I will discuss further below, the main challenge of studying distributive justice according to need is that needs are different both between and within employees because needs are salient at different times (Bierhoff et al., 1986), and this fluctuation in needs creates complexity in extrapolating individual needs to organization-level and individual work outcomes. Menstrual cycles also vary within and between women (Schoep et al., 2019), and this variation presents challenges in extrapolating individualized processes to organization-level and individual work

outcomes. Thus, I aligned the challenges associated with menstruation and distributive justice research in this study. Within-cycle menstruation differences can be assessed using a phase differentiation approach (e.g., follicular, ovulatory, luteal, Casto et al., 2023), an ovulatory differentiation approach (e.g., ovulatory v. non-ovulatory, Durante et al., 2011), or a daily approach (Motro et al., 2018). Recent research on within-person justice differences has explored within-person differences over time (Xu et al., 2022) and daily (Lennard et al., 2022; Matta et al., 2020). Yet neither of these approaches accurately captures what the needs principle of distributive justice is lacking – an over time, incident-based approach that captures the changing saliency of needs. Thus, this study demonstrates that the challenges in capturing menstruation can be used to address the challenges faced in expanding distributive justice research.

Distributive justice. Research on distributive justice has proliferated over the last 30 years, but the scope of distributive justice research in particular remains too narrow (Rupp et al., 2017). This narrow perspective has effectively conflated distributive justice with equity (Colquitt, 2001), which contradicts the early distributive justice theory this research builds on (Deutsch, 1975; Rupp et al., 2017). Using a narrow definition of distributive justice is "limiting" (Deutsch, 1975, p. 137) and does not incorporate the "richness" of distributive justice theory (Rupp et al., 2017, p. 941). Thus, one theoretical implication of this study is that it starts adding to the richness of distributive justice research and provides an opportunity for consensus shift away from our current understanding of distributive justice (Davis, 1971).

The results from Study 1 indicate that menstruation resources trigger higher equality- and needs-based distributive justice perceptions compared to equity-based distributive justice perceptions, especially when uncertainty is high, and Study 2 demonstrates the same effect for equality-based distributive justice perceptions. Thus, these studies provide evidence for early

distributive justice theory that suggested individuals weight fairness perceptions differently according to the values triggered by the resource distribution (Leventhal, 1976). The resources were not allocated according to performance, so the weaker positive effect for equity-based distributive justice perceptions provides validity for the effects on needs- and equality-based distributive justice perceptions. These results also indicate that even when the resource is distributed to intentionally support employees' needs, the resource and uncertainty context influenced equality-based distributive justice perceptions more than needs-based distributive justice perceptions. It could be that the resource was not individualized enough to have an impact on need perceptions. This speculation provides thoughtful fodder for future research on needs-based allocations – do individualized needs-based resources like the soccer training mentioned previously strengthen the trigger for needs-based distributive justice perceptions more than blanket resources like new uniform kits for all athletes?

One strength of this dissertation is that it uses allocation-perception alignment. By allocation -perception alignment, I mean that perceptions associated with a distributed resource should match the intent or allocation decision guiding the allocation of that resource. While planning this study, the measure for distributive justice felt insufficient for understanding perceptions of menstruation resources because the resources are not distributed according to input, effort, or performance. Yet, menstruation resources certainly fell into the category of distributive justice because they were needs-based and not based on interpersonal interactions, information, or procedures. Thus, I intentionally designed this study to include a distributive justice perception that reflected the norm guiding resource distribution – need. Further, the results of this study also demonstrate that a simple measure of equity would not have been sufficient in understanding how menstruation resources, and needs-based resources more

broadly, impact employee fairness perceptions because the magnitude on the effect of equity-based distributive justice perceptions was smaller than that for equality- and needs-based distributive justice perceptions. As such, one contribution of this study is that it highlights a need for future distributive justice research to use allocation-perception alignment.

While this suggestion to use allocation-perception alignment may seem like an obvious recommendation, a review of past distributive justice research reveals a handful of studies that could have benefitted from allocation -perception alignment when distributive justice perceptions are the outcome. Consider a recent study that examined the effect of pay equity on distributive justice perceptions (Colquitt, 2001; Zhang et al., 2023). At first glance, using only the equity measure for distributive justice makes sense because the predictor is an equity measure. However, the researchers operationalized pay equity as within-group pay equity and between-group pay equity (Zhang et al., 2023), and within-group pay equity may target equality perceptions over equity perceptions. The theoretical model also included intergroup helping as an outcome of distributive justice, and equality-based distributive justice perceptions are more likely to facilitate group cohesion than equity (Leventhal, 1976), so the authors' model also could have benefitted from stronger allocation-perception alignment. A second distributed resource construct that could benefit from increased allocation -perception alignment is leader-member exchange (LMX) (Graen & Schiemann, 1978). LMX and justice research demonstrates that LMX increases distributive justice perceptions (Li et al., 2023), yet the social exchange that drives LMX may also be needs-based. Good leaders satisfy individual needs (Lanaj et al., 2016), which could trigger needs-based distributive justice perceptions rather than equity- or equality-based distributive justice perceptions. Additionally, good leaders adapt with changing circumstances to provide appropriate leadership for their employees, and understanding how

distributive justice contexts fluctuate according to needs may also provide deeper insight into the changing, dynamic nature of strong leadership. Future researchers should carefully consider how the allocation norm used to distribute the resource aligns with the distributive justice perception outcome being measured to avoid theory-design mismatch (Shaw, 2017).

This suggestion for allocation-perception alignment does not necessarily call past distributive justice research into question, though it raises many questions regarding unmeasured variables in the distributive justice process. For example, the early and predominant focus on equity is appropriate for understanding employees' fairness judgements associated with equitable distribution, such as compensation. However, it is possible that this narrow understanding restricted the full picture of distributive justice associated with compensation. For example, compensation may strike needs-based distributive justice perceptions if individuals perceive that the equitable distribution also satisfies their individual financial needs. Further, the singular focus on equity in previous research does call into question our current understanding of distributive justice broadly and theoretically. Deutsch (1975) and Leventhal (1980) argue that distributive justice perceptions for equity are formed in parallel with distributive justice perceptions for need and equality. Without inclusion of needs and equality, we have virtually no understanding of what that parallel process actually looks like at work. Thus, while these results do not necessarily call previous distributive justice research into question, they do provide evidence that there is unexplained richness in distributive justice research (Colquitt & Zapata-Phelan, 2007). These results demonstrate that distributive justice has room for improvement among multiple elements, which is a contribution to theory development (Whetten, 1989).

A second strength of this study is that it uses all three principles of distributive justice perceptions rather than just one, which provides initial empirical evidence that the current

mainstream approach to studying distributive justice using only equity-based distributive justice perceptions is too narrow (Colquitt, 2001; Rupp et al., 2017). The results of this study suggest that including all three principles underlying distributive justice perceptions provides more information than just equity-based distributive justice perceptions, and that when distributive justice is the construct of interest, researchers are missing much of the bigger picture if they only include equity-based perceptions. However, it may not always be feasible to consider each perception, so in which cases is it imperative to include multiple principles? Consider a needs-based resource like flexible work arrangement, but also consider that this resource may be limited. Managers are then forced to weigh other values when deciding who gets to work from home, such as performance. In this case, equity perceptions should be included in conjunction with needs-based perceptions. Or, as this study demonstrated, because the resources were also distributed equally (a parallel value to need in the allocation decision), leaving equality perceptions out of the equation would have altered the implications of this study. Thus, the mainstream distributive justice measure is only a small piece of the larger distributive justice picture, and future distributive justice research should include more than just equity-based distributive justice perceptions (Rupp et al., 2017).

The results of this study also raise questions regarding the role of distributive justice perceptions in impacting individual well-being outcomes because there were no significant relationships between distributive justice perceptions and vitality. Rather than distributive justice perceptions, the full model results indicate that only needs-based menstruation resources are significantly positively related to vitality. There are many potential explanations for these results. The measures for needs-based and equality-based distributive justice perceptions have not been validated, so it could be that respondents were reacting to some other facet of the measure that

does not reflect distributive justice perceptions. For example, the items for equity-based distributive justice perceptions, "The menstruation resources provided by [organization] are appropriate for the work I have completed" does not have the same level of readability as "are provided consistently among employees" from the equality perception items. The absence of significant effects could also be related to power, as there are only 20 clusters in the multi-level sample with 19 parameters estimated. When resources are not included as a predictor, equality-based distributive justice perceptions significantly and positively predict vitality ($\gamma = .15$, $p = .05$), so there is reason to believe that equality-based distributive justice perceptions would demonstrate a consistent dominant effect throughout the model if the sample had more power. If equality-based perceptions demonstrated this effect, the results would provide even further evidence that these three principles of distributive justice are weighted differently by individuals, and that this difference in weighting differentially impacts outcomes. Finally, the results could be due to the fact that tangible resources bypass any change in distributive justice perceptions while they support individual well-being. Thus, while this study does not provide any conclusive evidence about the role of distributive justice perceptions in impacting well-being, the study does provide conclusive evidence that resources distributed according to need positively influence individual well-being.

Practical implications.

This study has many practical implications, but the first draws on the final point just made – that needs-based menstruation resources increase the well-being of menstruating employees. While it may not be financially feasible for organizations to provide all menstruation resources to each menstruating employee, the resources have a relatively low cost at $4.67 per woman annually (Segran, 2016). As a Canadian government official remarked, "We don't expect

you to bring your own toilet paper to work, so why should we expect you to bring pads and tampons?" (Witten, 2023). If organizations approach their budget allocation for menstrual products the same way they do toilet paper, they would be providing a valuable resource to menstruating employees - their health. The supplemental analysis also indicates that organizations that provide these resources to menstruating employees not only positively influence individual vitality, but in turn, they also positively influence employee performance. Menstruation resources require very little investment from the organization in terms of needs-based distributions. They do not require manager decision-making or prioritization of scarce resources, and they do not require interpersonal investment. Thus, providing menstruation products is an approachable, achievable, low-effort opportunity for organizations to improve menstruating employee performance.

Understanding the effect of menstrual products is just the tip of the iceberg in understanding the effects of needs-based menstruation resources more generally. The resources in this study were provided to all employees, and yet they still led to within-individual increases in vitality. These results suggest that resources for menstruating employees may be especially important in industries where employee roles require physical energy. For example, when female athletes receive uniform kits with black options, it reduces the additional cognitive effort the athlete dedicates to managing their uniform on menstruation days. If customer-facing employees have discretion over bathroom breaks, it alleviates the necessity of mental gymnastics during scheduled bathroom breaks and reduces employee uncertainty. This is important for customer-facing employees, who already may experience depletion due to emotional labor (Chi & Grandey, 2019). Employees in roles that explicitly require energy are not the only ones who could potentially benefit. Fatigue increases supervisor abusive behavior (Barnes et al., 2015)

unethical conduct (Barnes et al., 2011), and risk-taking behaviors (Acheson et al., 2007). Thus, menstruation resources could benefit menstruating employees in many roles and industries.

Limitations and future directions.

Limitations. This dissertation has a handful of limitations that must be addressed when interpreting the results of these two studies. First, the theory chapter proposes that these effects exist for women in menstruation, maternity, and menopause. Yet, the empirical study only tests these effects among women in menstruation. While the theorizing suggests that the empirical results for menstruating employees should extrapolate to maternity and menopause, they are distinctly different reproductive phases characterized by distinctly different physical needs. This limitation leaves room for future research that explores these effects among women in maternity and menopause.

Second, the Study 1 Level-2 sample size is rather small ($N = 20$), and there is only 1 residual degree of freedom in the model. This power analysis indicates that when $N = 20$, the effect size for even the strongest coefficient ($\gamma = .52$, $f^2 = 1.02$) does not exceed the .80 threshold for power (power = .77), which means the Study 1 model does not provide sufficient power to support the results. However, post-hoc power analysis for Study 2 indicates that the sample size provides sufficient power to detect all reported significant effects, and the sufficiently-powered Study 2 results are similar to the results from Study 1. So although the Study 1 sample size is limiting, the similarity in results with a higher-powered study is promising. Additionally, this model used fixed effects estimates only, which avoids some of the standard error bias that accompanies small sample sizes and random effects (Browne & Draper, 2000).

Alongside this limitation, an additional component regards that lack of significant relationships between distributive justice perceptions and vitality in Study 1. This lack of

significance could be due to low power or an incorrect outcome choice. First, to address these issues, I first examined the effect of distributive justice perceptions on participants' likelihood to accept a job at DropWorks in Study 2. Using logistic regression and `lavaan` in R, I regressed all three types of distributive justice perceptions and the effect of resources (experimental conditions collapsed, 0 = control/no resources, 1 = experimental conditions/resources) on DropWorks offer acceptance. Results indicate that needs-based ($\beta = .80$, $p = .04$) and equity-based ($\beta = .63$, $p = .03$) distributive justice perceptions are positively related to job acceptance, while equality-based distributive justice perceptions are not ($\beta = -.01$, $p = .95$). These results address both issues in Study 1 because a higher-powered study demonstrates that distributive justice perceptions explain variance in an individual outcome variable over and above the effect of resources. Thus, these results suggest that the lack of results in Study 1 may be due to low power, which I further confirm below. Because offer acceptance is not the same outcome as vitality, these results may also suggest that vitality was not the appropriate outcome to measure in Study 1. Alternative Study 1 models include using individual performance and group identification as potential outcomes. However, these results indicate that all three distributive justice perceptions do not explain additional variance in the outcome. With no significant results using alternative outcomes in Study 1, the lack of results in Study 1 are likely due to low power.

The third limitation of the study design is that the scales used to measure needs- and equality-based distributive justice perceptions have not been validated. A recent justice review article listed all the constructs used to measure justice as of 2017, and there is no validated measure to assess the need and equality principles of distributive justice (Rupp et al., 2017). The items used for needs-based justice followed Colquitt's (2001) method of drawing on early distributive justice research; the items were developed based on Leventhal's definitions of needs-

based allocations (Leventhal, 1976) and have face validity (e.g., “the menstruation resources reflect employee needs”). In the equality-based distributive justice perceptions measure, two items originate in the procedural justice scale (Colquitt, 2001) and one is a face valid item (e.g., “are distributed equally among employees”), but there is no construct validation that indicates this group of items reflect equality specifically. Without construct validation for the needs-based or equality-based justice measures, it is difficult to draw conclusions regarding the divergence or congruence between the three principles of distributive justice.

Future directions. This study demonstrated that menstrual products, provided to everyone, impact equality-based distributive justice perceptions more than they effect needs-based distributive justice perceptions. Future research on the need principle of distributive justice should explore needs-based resources that are not provided to everyone and instead, are provided on an as-needed basis or at the discretion of a manager. This research would provide insight into the deliberation process associated with distributing needs-based resources, and it could also provide insight into the perceptions of those who do not receive needs-based resources. Also, because the resources are not provided equally, this future research may show that the resources have a stronger relationship with needs-based distributive justice perceptions than equality-based distributive justice perceptions among resource recipients. Alternatively, equality-based perceptions are likely to be lower among those who do not receive the resources. Menstruation research could also explore the effect of menstruation resource distribution where distribution is finite. For example, a restaurant has a limited roster of trained employees, but could offer menstruating employees the option to call out of work one day a month and get paid a flat rate *if the schedule allows*. For many restaurants, losing one employee a night increases the workload for the remaining employees but is survivable. Losing two employees changes the entire cadence

of the evening. The amount of time off available in one day is limited and at the discretion of the manager, so scenarios like this one provide a unique opportunity to differentiate equality- and needs-based distributive justice perceptions.

A second question to answer in future research is whether providing more resources overall increases needs-based distributive justice perceptions (breadth), or whether providing resources that are more individualized increases needs-based distributive justice perceptions (depth). In sum, a question of breadth or depth. I previously used the example of the new coaching direction for the U.S. Women's National Team, and I noted that the team uses an individualized approach to training and recovery guided by each player's menstrual cycle. This depth approach to needs-based resources may lead employees to place increased weight on their value for need and needs-based justice perceptions. On the other hand, future research could also examine the effects of comprehensive menstruation resources, including menstrual leave, menstrual products, well-being rooms near workstations, and additional accommodations for menstrual symptoms. If the comprehensive provision of resources strengthens needs-based distributive justice perceptions, this research would suggest breadth amplifies needs-based distributive justice perceptions.

A third future direction for research is to explore the effect of menstrual cycle hormones on the effects of needs-based resources. For example, an individual factor that contributes to contexts of uncertainty is anxiety and negative mood (Miceli & Castelfranchi, 2005), both of which increase in the days leading up to the onset of menstruation, and sometimes persist throughout menstruation as a result of hormone changes (Pierson et al., 2021; Reed et al., 2008). The reproductive hormone progesterone is associated with this increase in anxiety and negative mood (Reynolds et al., 2018), so measuring changes in individual progesterone before and

during menstruation may provide additional insight into the individual factors affecting their feelings of uncertainty.

The final future direction regards the measurement and study of distributive justice. While there has been little to no research on the need and equality principles of distributive justice (Rupp et al., 2017), I provided many examples in which equality or need may have played a role in fairness perceptions. Importantly, the current measures available provide no measure of need or equality (Rupp et al., 2017), but they do contain items that imply need and equality. For example, I used two items from the procedural justice sub-dimension to operationalize equality perceptions. Doing so suggests that part of the procedural justice measure may be explained by a higher order construct like equality. The need pillar may be related to the interpersonal justice items, such as being treated in a "polite manner," "with dignity," and "with respect", and the informational justice item "tailored to individuals' specific needs" (Colquitt, 2001, p. 389). Further, many of these items do not have to be specifically tied to their anchor (e.g., interpersonal treatment), so a set of higher-order constructs may provide consensus among the organizational sub-dimensions as well (Colquitt, 2001). Thus, I recommend that future research develop a higher-order construct of organizational justice, using equity, equality, and need as the value anchors.

Building on the future direction above, I also suggest that organizational justice research, broadly, should differentiate the effects of equity, equality, and need in the current organizational justice sub-dimensions for procedural, interpersonal, and informational justice (Colquitt, 2001). For example, I previously noted that leader-member exchange likely facilitates needs-based distributive justice perceptions. However, interpersonal justice may reflect this same effect because the interpersonal justice items (e.g., "treated you in a polite manner" and "treated you

with respect") also likely satisfy interpersonal needs. Further, I used information richness as a moderator in the theoretical and empirical model, but information richness may reflect a similar effect to informational justice because explanation of thorough procedures and communication tailored to individuals' specific needs (both informational justice items) are similar to the definition for information richness - multiple cues and entry points for understanding as well as personalization of needs-based resources. Thus, the results of this study suggest that there could be an informational justice by needs-based resources interaction rather than an information richness by needs-based resources interaction. As such, future research that attempts to delineate the role of equity, equality, and need in organizational justice should include additional sub-dimensions of organizational justice (Colquitt, 2001).

Conclusion. In conclusion, the purpose of this dissertation was to demonstrate that providing needs-based resources for menstrual, maternal, and menopausal employees is beneficial. The theory in Chapter 3 explored how the physical symptoms associated with menstruation, maternity, and menopause create contexts of uncertainty among female employees, which amplifies the salience of distributed resources. The empirical studies in Chapter 4 provided support for most of the theoretical model and identified individual- and organization-level contingency factors that influence fairness heuristics. This dissertation demonstrates that resources allocated according to distributive justice norms that stray from equity influence employee distributive justice perceptions based on need and equality. As such, this study lays the groundwork to build further theoretical understanding of distributive justice (Deutsch, 1975). The empirical portion of this study demonstrates that needs-based menstruation resources positively influence menstruating employees' vitality. This study has implications for other research on women's health at work and provides an additional theoretical framework with

which to approach studying the intersection of work and the physical effects associated with menstruation, maternity, and menopause. Lastly, this study offers evidence that providing free menstrual products for menstruating employees not only benefits the employees, but also the organization.

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APPENDIX A – STUDY 2 INFORMATION RICHNESS EXPERIMENTAL MANIPULATION

Participants in all four conditions received the following instructions:

> "The following information describes some of the benefits provided to DropWorks employees.
> Please read through the information carefully, as we will ask questions about it after."

Control Condition

DropWorks EMPLOYEE BENEFITS

MEDICAL

- Two national medical plan networks to choose from: Cigna or Horizon Blue Cross/Blue Shield
- High deductible plan design with Health Savings Account (HSA)
- Lifetime Maximum: None

VISION

- Employees have three vision options with various levels of coverage (Base, Premier, Premier Plus)
- Employees not enrolled in the medical plan can enroll in vision coverage
- Monthly cost of coverage $3-10/$11-$32 per person/family

DENTAL

- $100/$250 deductible per person/family
- Maximum benefit - $1,000 per person
- Diagnostic and preventive covered at 100%
- Monthly cost of coverage $24/$84 per person/family

COMMUTER BENEFIT

- The Commuter Benefit provides the opportunity to save by purchasing qualified public transit and parking passes and vouchers with pre-tax dollars.
- Cost of Coverage – Based on Employee Election

VACATION AND HOLIDAYS

- Vacation time can be scheduled with manager approval based on business priorities and personal needs, without pre-set maximums
- All sites will have 12 days off for holidays

401K SAVINGS PLAN

- You may commence participation in the plan as soon as administratively possible following your hire date (generally within two weeks).
- Generally, you may elect to defer Pre-Tax, After-Tax, and Roth contributions.
- DropWorks matches 87.5% of the first 8% of eligible pay you contribute.
- Match will be contributed annually in a lump sum by the end of the January following the calendar year in which you contribute.
- DropWorks matching contributions generally become fully vested after completion of three years of vesting service.

Messaging Only Condition

DropWorks EMPLOYEE BENEFITS

Periods are NOT a choice, shame, or luxury, and menstrual health is a topic that is often stigmatized and ignored. Period products like pads and tampons are a basic and constant hygienic need - equivalent to toilet paper. Yet, 86% of women have started their period at work without the supplies needed. We can make a difference by proactively offering you free tampons and pads at your office. After all, if we're offering ping pong tables and complimentary coffee, why not period supplies? As such, period products like pads and tampons will be provided in all DropWorks restrooms for menstruating employees.

Resources Only Condition

DropWorks EMPLOYEE BENEFITS

MEDICAL

- Two national medical plan networks to choose from: Cigna or Horizon Blue Cross/Blue Shield
- High deductible plan design with Health Savings Account (HSA)
- Lifetime Maximum: None

VISION

- Employees have three vision options with various levels of coverage (Base, Premier, Premier Plus)
- Monthly cost of coverage $3-10/$11-$32 per person/family

DENTAL

- $100/$250 deductible per person/family
- Maximum benefit - $1,000 per person
- Monthly cost of coverage $24/$84 per person/family

401K SAVINGS PLAN

- You may commence participation in the plan as soon as administratively possible following your hire date (generally within two weeks).
- Generally, you may elect to defer Pre-Tax, After-Tax, and Roth contributions.
- DropWorks matches 87.5% of the first 8% of eligible pay you contribute.
- Match will be contributed annually in a lump sum by the end of the January following the calendar year in which you contribute.
- DropWorks matching contributions generally become fully vested after completion of three years of vesting service.

ADDITIONAL BENEFITS FOR MENSTRUATING EMPLOYEES

- Supervisors can approve work from home or hybrid schedules for employees experiencing acute (daily) or long-term health issues related to the menstrual cycle
- All work locations will have at least one single-occupant restroom menstruating employees can use
- All restrooms will contain free menstruation products for employee use
- Full reimbursement for menstrual products (e.g., tampons/pads)
- Dark pants or skirt option for uniformed employees
- Ability to schedule own breaks for employees with customer-facing responsibilities (e.g., call center employees)

Resources + Messaging Condition

DropWorks EMPLOYEE BENEFITS

MEDICAL

- Two national medical plan networks to choose from: Cigna or Horizon Blue Cross/Blue Shield
- High deductible plan design with Health Savings Account (HSA)
- Lifetime Maximum: None

VISION

- Employees have three vision options with various levels of coverage (Base, Premier, Premier Plus)
- Monthly cost of coverage $3-10/$11-$32 per person/family

DENTAL

- $100/$250 deductible per person/family
- Maximum benefit - $1,000 per person
- Monthly cost of coverage $24/$84 per person/family

401K SAVINGS PLAN

- You may commence participation in the plan as soon as administratively possible following your hire date (generally within two weeks).
- Generally, you may elect to defer Pre-Tax, After-Tax, and Roth contributions.
- DropWorks matches 87.5% of the first 8% of eligible pay you contribute.
- Match will be contributed annually in a lump sum by the end of the January following the calendar year in which you contribute.
- DropWorks matching contributions generally become fully vested after completion of three years of vesting service.

Periods are NOT a choice, shame, or luxury, and menstrual health is a topic that is often stigmatized and ignored. Period products like pads and tampons are a basic and constant hygienic need - equivalent to toilet paper. Yet, 86% of women have started their period at work without the supplies needed. We can make a difference by proactively offering you free tampons and pads at your office. After all, if we're offering ping pong tables and complimentary coffee, why not period supplies? As such, period products like pads and tampons will be provided in all DropWorks restrooms for menstruating employees.

ADDITIONAL BENEFITS FOR MENSTRUATING EMPLOYEES

- Supervisors can approve work from home or hybrid schedules for employees experiencing acute (daily) or long-term health issues related to the menstrual cycle
- All work locations will have at least one single-occupant restroom menstruating employees can use
- All restrooms will contain free menstruation products for employee use
- Full reimbursement for menstrual products (e.g., tampons/pads)
- Dark pants or skirt option for uniformed employees
- Ability to schedule own breaks for employees with customer-facing responsibilities (e.g., call center employees)

APPENDIX B – SUPPLEMENTAL ANALYSIS

Additions to the full manuscript.

I noted in the practical implications section of the full manuscript that menstruation resources may bypass changes in justice perceptions altogether, and instead increase vitality and performance. As such, I estimated a multilevel moderated mediation model, with menstruation resources predicting vitality and vitality predicting performance. Additionally, like the theoretical model, menstruation interacts with menstruation resources to predict vitality. The model results are summarized in Table 5. Consistent with the results in the theoretical model, menstruation resources significantly positively predict vitality ($\gamma = .28$, $p = .02$), and this effect is not moderated by menstruation ($\gamma = .25$, $p = .29$). Vitality positively predicts performance ($\gamma = .12$, $p = .04$, and the indirect effect of menstruation resources on performance via vitality is significant (IE = .02, 95% CI [.004, .036]). These results indicate that menstruation resources positively impact employee performance, which is an important outcome for organizations to consider when deciding whether or not to provide menstruation resources.

Analyses from the original dissertation proposal.

The original proposal had many more hypotheses and models. I discuss some of those models below to summarize the effects from the original dissertation proposal. Many of these models contain limitations given the small sample size of the field study, so these models are presented to be informative only, not for any major conclusions to be drawn. First, the original proposal contained many hypotheses regarding the importance of belonging need satisfaction during menstruation. I tested this in two ways. First, all participants in the field study were asked to rank their needs each week, and I used logistic regression in Stata to assess the effect of menstruation (0 = non-menstruating, 1 = menstruating) on need rank. The forced rank tasks

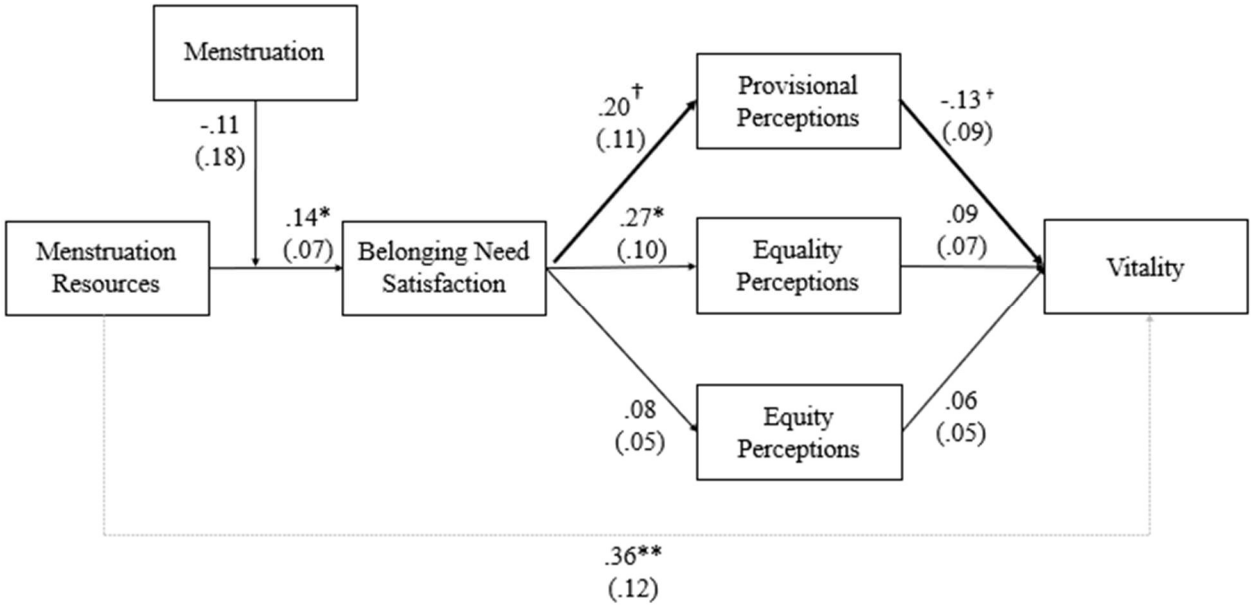
Table 5. Effect of menstruation resources on performance

	Vitality	**Performance**
Predictor	γ (*SE*)	γ (*SE*)
Menstruation resources	.28*	.01
	(.12)	(.08)
Menstruation	-.24	.12*
	(23)	(.05)
Resources × Menstruation	.25	
	(.29)	
Vitality		.07*
		(.04)
Indirect effects		Est. [LCI, UCI]
via Vitality		.02 **[.004, .036]**

Note. Level-2 $N = 20$, Level-1 $n = 198$. LCI = lower confidence interval; UCI = upper confidence interval. Indirect effect CI's = 95% bootstrapped (20,000). Bold confidence intervals are significant. Unstandardized effects are reported in the table.
*$p < .05$

indicates that menstruating women consistently rank their need for belonging higher than their need for competence ($\beta = 2.50$, $p < .001$), but that the ranking between belonging and autonomy is not significantly different ($\beta = -.08$, $p = .59$). I also tested these using a serial mediation model that includes adding belonging need satisfaction between menstruation resources and justice perceptions. The results are included in Figure 6. The results of this model show that belonging need satisfaction plays a very similar role to menstruation resources alone, with its stronger impact on equality perceptions ($\gamma = .27$, $p = .01$) than provisional perceptions ($\gamma = .20$, $p = .06$). Thus, adding belonging need satisfaction to the model does not provide additional explanatory value beyond the theoretical model used in the full manuscript.

Figure 6. Theoretical model including belonging need satisfaction



Note. †$p < .10$
*$p < .05$
** $p < .01$
** $p < .001$

Second, following up on the proposition that belonging need satisfaction is the most important to menstruating employees, there was some conversation regarding need-supplies fit and if need-supplies fit may be the driving factor in justice perceptions rather than need satisfaction alone.

For need-supplies fit analysis, I used multilevel polynomial regression (Edwards, 2002). For the purposes of this supplemental analysis, polynomial analysis was used to asses the effect of (in)congruence in SDT needs and supplies. Each week, participants responded to the need satisfaction items used in main analyses as well as need valuation items for the same SDT needs. Their responses to both the need valuation, which I term need (*N*) for the polynomial analyses, and the need satisfaction, which I term supplies (*S*) were used to create the terms in the polynomial regression. The polynomial analysis estimates include need, supplies, their squared

terms, and their interaction term (Edwards & Parry, 1993). I used the following polynomial equation (1):

$$(1)\ J = b_0 + b_1N + b_2S + b_3N^2 + b_4NS + b_5S^2$$

where *J* indicates the justice outcome, *N* the needs, and *S* the supplies. Need and supplies were midpoint-centered before creating the second-order terms. The coefficients from Equation 1 are then used to create a surface response plot. Need (*N*) is plotted on the x-axis, supplies (*S*) is plotted on the y-axis, and the justice outcome (*J*) is plotted on the vertical axis (See Figure 2a for an example).

For the purpose of these supplemental analyses, the necessary but insufficient condition for identifying a congruence effect is that that change curvature, or the curvature along the line of incongruence, must be significant ($a_4 \neq 0$) (Edwards & Cable, 2009). The expectation is that justice perceptions will decrease as need-supplies fit becomes more incongruent, so the change curvature should be negative ($a_4 < 0$) to indicate a concave surface (Cole et al., 2013). In fit models where this condition is passed, further analysis of the response surface is provided.

Table 6. Belonging Need-Supplies Fit Polynomial Regression Results

	Belonging need-supplies fit		
	Provisional perceptions	Equality perceptions	Equity perceptions
Measure	γ (*SE*)	γ (*SE*)	γ (*SE*)
Coefficients			
Intercept	2.68 (.16)	2.84 (.18)	2.74 (.14)
Need-supplies fit variables			
Need (b_1)	.06 (.15)	.19 (.16)	.30 (.13)
Supplies (b_2)	-.08 (.23)	-.09 (.25)	.28 (.20)
Need sq. (b_3)	-.26* (.12)	.24+ (.14)	-.24* (.20)
Need x supplies (b_4)	.28^{+} (.16)	.22 (.18)	.13 (.14)
Supplies sq. (b_5)	.06 (.13)	.06 (.15)	-.14 (.12)
Congruence Parameters			
Stability slope (a_1)	-.02 (.24)	.11 (.27)	.58* (.21)
Stability curvature (a_2)	-.08 (.12)	.04 (.13)	-.27* (.11)
Change slope (a_3)	.15 (.30)	.28 (.33)	.01 (.26)
Change curvature (a_4)	-.48 (.30)	-.40 (.33)	-.52* (.26)
$b_3 - b_5$ (a_5)	-.32 (.20)	-.30 (.22)	-.10 (.18)
	Est. [LCI, UCI]	Est. [LCI, UCI]	Est. [LCI, UCI]
Principal Axes			
Intercept, PA 1 (*p10*)	-0.40 [-2.027, 1.230]	-1.23 [-4.74, 2.017]	-0.55 [-3.770, 2.663]
Slope, PA 1 (*p11*)	2.69 [-0.331, 5.702]	-0.79 [-1.644, 7.732]	2.00 [-2.637, 6.641]
Intercept, PA 2 (*p20*)	0.28 [-1.318, 1.871]	0.12 [-2.212, 2.458]	1.79 **[0.858, 2.722]**
Slope, PA 2 (*p21*)	-0.37 **[-0.791, 0.046]**	-0.33 **[-0.835, 0.177]**	-0.50 [-1.66, 0.658]

Note. Polynomial variables were midpoint centered before second-order terms were created. . LCI and UCI refer to the 95% confidence intervals. Bold confidence intervals are significant.
$^{+}p < .10$
$^{*}p < .05$

The first analysis explores the effect of belonging need-supplies fit on provisional, equality, and equity justice perceptions. Table 6 contains a summary of the results. Table 6 demonstrates that the belonging need-supplies fit change curvature is not significant for equality perceptions ($a_4 = -.40$, $p = .23$) or provisional perceptions ($a_4 = -.48$, $p = .11$). The response

surface for provisional justice is plotted in Figure 7a, and it indicates that there is a strong positive effect of belonging need supplies (e.g., need satisfaction) on provisional justice, regardless of belonging need, which is confirmed by the non-significant change curvature.

The change curvature is significant for equity perceptions (a_4 = -.52, p = .046). The response surface for equity justice perceptions is plotted in Figure 7b and indicates that the surface is concave. The results and the surface indicate that the intersection of the first and second principal axes (white lines) is shifted away from the intersection of the lines of (in)congruence (blue lines). The response surface also indicates that the downward trend associated with the line of incongruence (blued dotted line) is shifted away from the "ridge," or the line where the downward trend is sharpest (white solid line). Thus, an incongruence effect of belonging need-supplies on equity justice perceptions is not supported. However, the stability slope is significant and positive (a_1 = .58, p = .01). The response surface indicates that high values of congruence are associated with higher equity-based justice perceptions than low values of congruence. Thus, the response surface supports a linear additive effect of belonging need-supplies congruence on equity-based justice perceptions, but a congruence effect is not supported. In sum, the results in Table 6 and Figures 7a-b demonstrate that there is no in(congruence) effect supported for belonging need-supplies fit.

Figure 7a. Surface Response Plot for Belonging N-S Fit on Provisional Justice Perceptions

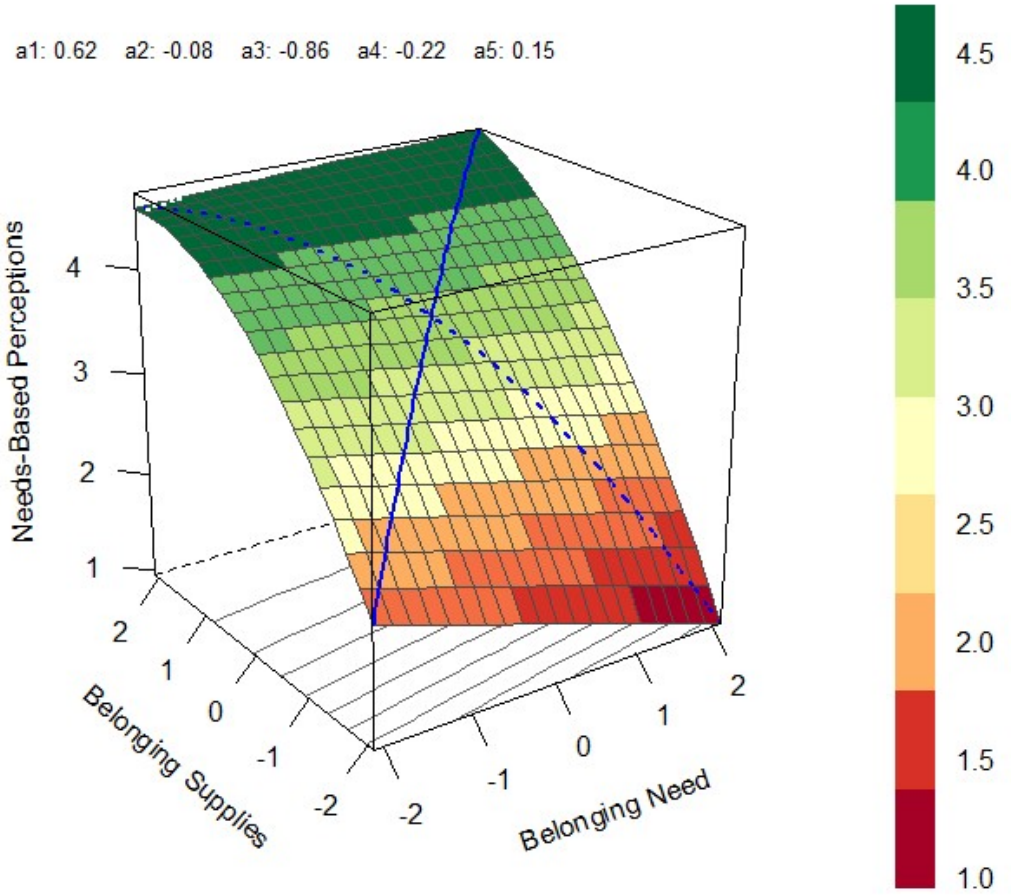


Figure 7b. Response Surface Plot for Belonging Need-Supplies Fit Predicting Equity-Based Justice Perceptions