REACTIONS TO WEARABLE MONITORING PROGRAMS:

THE INFLUENCE OF PRIVACY AND SELF-DETERMINATION

A Thesis

by

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ABSTRACT

The present paper contains two investigations of employee and prospective job applicant reactions to different wearable device monitoring programs. In Study 1, 275 individuals evaluated vignettes describing three organizational wearable programs that differed in the purpose for monitoring and whether participation was mandatory. Compared to a program that monitors employees solely for the organization's benefit, programs that benefit employee safety and well-being resulted in more favorable outcomes, including more enthusiasm to participate, fewer turnover intentions, and less perceived invasion of privacy. This effect was more pronounced for participants who reported greater concern for information privacy. In Study 2, 128 nursing students evaluated a job description and three news stories that described different wearable programs. Participants reported significantly more organizational attractiveness and intentions to pursue employment after reading about programs that benefit employee safety and well-being than after reading about a program that solely benefits the organization. Participants' anticipated satisfaction of the need for autonomy varied relative to wearable program purposes, but anticipated satisfaction of the needs for relatedness and competence did not. Anticipated satisfaction of these basic psychological needs partially mediated the relationship between awareness of a wearable monitoring program and prospective job applicants' reactions. Concern for information privacy did not have a significant effect on prospective job applicants' reactions.

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NOMENCLATURE

ANOVA	Analysis of Variance
CCTV	Closed-Circuit Television
CFIP	Concern for Information Privacy
CWB	Counterproductive Work Behavior
EPM	Electronic Performance Monitoring
GPS	Global Positioning System
HR	Human Resources
HRM	Human Resource Management
MANOVA	Multiple Analysis of Variance
PPE	Personal Protective Equipment
SDT	Self-Determination Theory
SEM	Structural Equation Modeling
SHRM	Society for Human Resource Management
TAM3	Technology Acceptance Model (3rd revision)
UTAUT	Unified Theory of Acceptance and Use of Technology

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1. INTRODUCTION

From the development of crop rotation techniques to IBM's Watson and artificial intelligence, technological developments have had an enormous impact on human productivity, both at work and at home. Over the past decade, a new stage of technological development has emerged: the rise of ubiquitous computing (Cascio & Montealegre, 2016). Advances in miniaturization and microprocessor technologies have facilitated a rise in affordable, highly mobile computing devices, including wearable sensors (Pentland, 2000). Wearable sensors (heretofore referred to as "wearables") facilitate the collection and storage of a variety of data about users and their immediate environments and permit remote interactions between users and any other connected devices. Through wearables, individuals can interact with their thermostat, car, phone, computer, or any other device with a wireless connection. In turn, those connected devices could deliver information to other individuals, or additional devices in a network. By extension, this means that individuals are also essentially integrated into the "Internet of Things," making them observable in a variety of ways from anywhere, at any time. Thus, similar to the advent of laptop computers and mobile phones, wearables can be viewed as a platform that has fundamentally changed how employees interact with one another and their organization.

Over the past decade, wearable devices have become commonplace in daily life, and organizational monitoring programs that use wearable devices are gaining popularity. In 2018, an estimated 21% of large firms (over 200 workers) in the United States were collecting health data from employees' wearable devices or mobile phones,

up from 14% of large firms in 2017 (Kaiser Family Foundation, 2018). Despite the COVID-19 pandemic driving many employees to work remotely, an estimated 10% of large firms added or increased support for wearable devices for wellness programs in 2021 (Kaiser Family Foundation, 2021). ABI Research has projected that sales of wearable devices for company wellness programs could exceed 18 million units by 2023 (Rowland, 2019). Cority (2019) surveyed environmental health and safety professionals across various industries, and reported that 54% of the 203 respondents anticipate that wearable devices and sensors embedded in personal protective equipment (PPE) will be deployed in their organization in 2024. Certainly, these devices have their benefits; organizations are using them as part of initiatives to promote healthier workforces (e.g., Brakenridge et al., 2016; Kaiser Family Foundation, 2018), safer work behaviors (e.g., Choi et al., 2017; Cority, 2019; Fujitsu, 2017), and increased productivity (Olguin et al., 2009). However, as is often the case with emerging technologies, practice currently outpaces science (Rynes et al., 2007).

Despite the explosive rise in the utilization of wearables in the workplace, numerous opportunities for research investigating the attitudinal and behavioral outcomes of the implementation of wearable monitoring programs in the workplace remain (Cascio & Montealegre, 2016). Presently, organizational leaders have little more to rely on than good intentions when it comes to the implementation of wearable monitoring programs. The objective of the present research is to begin to address this gap in the research literature by examining the effect that the following variables have on individuals' reactions to wearable monitoring programs: (1) the communicated

purpose of the organization's wearable program, (2) whether participation in the program is discretionary, (3) individual differences, and (4) anticipated psychological need fulfillment. Study 1 explores the influence of these variables on simulated employee reactions using hypothetical vignettes, and Study 2 explores the influence of these variables on prospective job applicants' reactions by providing a sample of potential job seekers with information about monitoring in hypothetical jobs.

1.1. Electronic Performance Monitoring

Currently, there is a limited amount of research on the attitudinal and behavioral outcomes of workplace wearable monitoring programs. The bulk of the extant research on wearable monitors exists in the Information Systems field and is focused narrowly on users' acceptance (i.e., perceived usefulness, perceived ease of use, and intentions to use) of different wearable safety monitoring technologies (e.g., Choi et al., 2017; Kwee-Meier et al., 2016; cf. Jacobs et al., 2019). While important, models of technology acceptance, such as the technology acceptance model (TAM3; Venkatesh & Bala, 2008) and the unified theory of acceptance and use of technology (UTAUT; Venkatesh et al., 2003), do not address what attitudes or behaviors emerge *beyond* whether employees use or intend to use a given technology. Further, the potential effects of affect and emotion are largely absent from these models (Stam & Stanton, 2010). Fortunately, there is a body of literature on electronic performance monitoring (EPM) which provides a solid foundation on which to build this investigation.

EPM is the utilization of electronic instruments or devices to collect, store, analyze, and report the performance of an individual or a group (Nebeker & Tatum,

1993). Early EPM research treated EPM as a dichotomy, focusing on the presence or absence of EPM and the subsequent effects (Ravid et al., 2020). Being monitored via EPM is associated with a number of outcomes, some of which are: increased job stress (Aiello & Kolb, 1995), turnover intentions (Heavey et al., 2013), perceived invasion of privacy (Karim et al., 2014), and decreased perceptions of interpersonal justice and job satisfaction (McNall & Roch, 2007). However, like any other tool, EPM can be used in a variety of contexts for an even larger variety of reasons within an organization; thus, it is important to focus not only on the mere presence of EPM, but on the larger context in which it is used (Stanton, 2000a). Additionally, nearly all of the extant EPM research focuses on electronic monitoring methods such as computer monitoring, time clocks, or GPS tracking of vehicles, as opposed to wearable monitors. Wearable sensors can capture a greater variety of data across several different contexts than more traditional monitoring methods (Karim et al., 2015; Olguín et al., 2009). This difference can present unique challenges and opportunities with the implementation of wearable monitoring programs that might not have been captured in previous studies centered around older, non-wearable EPM.

Whereas non-wearable EPM programs monitor employees at work in a relatively fixed location, wearable monitoring programs are pervasive; they can monitor employees as they move around the workplace, between worksites, and in nonwork-related locations. Wearable sensors can capture information related to employees' physiological state, providing organizations or vendors with data used to make inferences about employees' levels of stress, fatigue, or overall physical health.

Wearable sensors can be embedded into accessories, such as wristbands or watches, into clothing, into work equipment, or some other artifact (e.g., adhesive patches) that can be worn by an individual. Due to the expansion of the types of data that can be gathered (e.g., physiological, actigraphic), organizations have also expanded the range of purposes for which wearable devices can be deployed. Wearables are therefore distinct from more traditional monitoring devices not only in their novelty, but in the enormous potential they have to provide organizations with second-by-second data on employees' physiological state and geographical location. These data, in turn, can be used for a variety of purposes, which may play a central role in how employees react to being monitored.

1.1.1. Understanding Reactions to EPM

Stanton (2000a) provides a heuristic framework to understand the myriad of variables that influence employees' reactions to EPM (Figure 1). Broadly, the framework proposes that reactions to the stated purpose or justification for an EPM program are mediated by both the characteristics of the monitoring program (e.g., how much control employees have over the monitoring) and attitudes or cognitions about the program (e.g., perceived fairness of the program). Further, the relationship between the program's stated purpose and individuals' reactions are moderated by individual differences (Stanton, 2000a). For example, a manager may tell employees that the company will be implementing an EPM program to monitor how many tasks an employee can complete in an hour (stated purpose), and that work from all production employees will be monitored (program characteristic). Employees with an external locus

of control (individual difference) may experience more apprehension about being monitored and evaluated (attitude) than employees with an internal locus of control (Aiello & Svec, 1993). As a result, those employees may react with stronger intentions to quit (reaction). As with traditional EPM methods, the implementation of wearables may affect multiple employee and organizational outcomes. Although wearables introduce novel forms of data collection, they are ultimately an EPM platform, and therefore fit within Stanton's (2000a) framework.

Stanton (2000a) proposes that employee reactions to EPM can be grouped in two categories: initial reactions to the EPM itself and long-term reactions that follow initial reactions, which are influenced by post-monitoring activities (e.g., performance feedback). With regard to reactions to the EPM itself, Stanton proposes that employees form attitudes and experience physiological arousal when they become aware of the EPM, which influences performance outcomes and more distal reactions to their job or the organization. Examples of attitudes formed in response to EPM (which are referred to as "monitoring cognitions") include perceived fairness (Moorman & Wells, 2003), perceived invasiveness (Alge, 2001), and perceptions of the relative importance of different roles and tasks (e.g., quantity vs. quality; Bhave, 2014).

Perceived invasiveness is proposed as a multidimensional attitudinal construct, consisting of feelings of privacy violations, intrusiveness, and appropriateness of the nature of monitoring (Stanton, 2000a). Similarly, EPM invasiveness has been conceptualized as a composite of intrusions to individuals' privacy, autonomy, or sense of personal boundaries caused by the utilization of EPM (Ravid et al., 2020). As the

massive volume of data that devices can capture continues to increase, so too will employee concerns around their privacy and information security (Guzzo et al., 2015; Rotolo & Church, 2015). Clearly, EPM use is likely to be related to feelings of invasiveness, particularly perceived invasions of privacy.

An additional outcome of interest is an individuals' willingness to participate in an EPM program (i.e., acceptance of the monitoring). Although it may seem superfluous to consider willingness in a context where individuals rarely have a choice in whether to be monitored, distal reactions in the form of counterproductive work behavior (CWB) are a concern when EPM is used (Bhave, 2014; Yost et al., 2019). Based on the theory of reasoned action (Fishbein & Ajzen, 1975), technology acceptance models such as the TAM3 and UTAUT propose that individuals' intentions or willingness to use a technology generally lead to actual use behaviors (Venkatesh & Bala, 2008; Venkatesh et al., 2003).

"Long-term" outcomes to EPM, such as perceptions and accuracy of performance appraisal and feedback, are proposed to be a distal consequence of post-monitoring activities (Stanton, 2000a). However, it may be the case that no post-monitoring activity occurs, or at the very least, employees are unaware that the organization engages in any activity (Ravid et al., 2020). When this happens, long-term outcomes may be more directly influenced by affective reactions and attitudes towards the EPM program. One such example of a long-term outcome is employees' intentions to turn over. As actual turnover data can be difficult to acquire, turnover *intentions* are frequently gathered as an alternative. Tomczak and Behrend (2019) note turnover

intentions are a concern when considering the impact of EPM on employees, given the negative relationship between EPM usage and job satisfaction and organizational commitment (Wells et al., 2007), both of which are negatively associated with turnover intentions, which has a robust relationship with actual turnover behavior ($\rho = .38$, $k = 71$; Griffeth et al., 2000). Further, collective turnover (i.e., aggregate turnover at the organizational level) is negatively related to organizational use of EPM ($\bar{r} = .18$, $k = 5$; Heavey et al., 2013).

1.1.2. EPM Purposes

Consistent with Stanton's (2000a) theorizing that the purpose for monitoring is a key variable to consider, EPM researchers have identified several different, but not mutually exclusive, reasons for monitoring. Wells et al. (2007) distinguish between the intended purpose of EPM and the perceived purpose of EPM. As an example, an organization may truly be monitoring internet usage on company computers solely as a matter of cybersecurity, but employees may perceive that their internet usage may be taken into consideration during their performance reviews. Wells et al. (2007) focus specifically on the perceived purpose of EPM, and propose that EPM can be perceived to be developmental or a deterrent. When an organization monitors employees to improve performance, as opposed to using it to deter undesirable behaviors, EPM is being used for a developmental purpose. In a field study at a large call center, Wells et al. (2007) found that EPM that was perceived to be developmental was positively associated with perceptions of fairness, job satisfaction, commitment, and felt obligation, and EPM perceived to be a deterrent was negatively associated to all four job attitudes.

In a review of the extant EPM literature, Ravid et al. (2020) offer a taxonomy of different EPM characteristics. As part of this taxonomy, Ravid et al. propose that an EPM program's purpose can be classified into one or more of the following four categories: (1) performance appraisal, loss prevention, and profit, (2) development, growth, and training, (3) administrative and safety, and (4) surveillance and authoritarian control. In this taxonomy, an organization may monitor employee performance in order to incentivize desirable behaviors, discourage undesirable behaviors, and facilitate comparisons between employees. Additionally, an organization could monitor employee development in order to facilitate within-person comparisons. Administrative and safety EPM purposes facilitate the protection of employers and employees from harm. The final purpose in Ravid et al.'s taxonomy describes monitoring that lacks clear instrumentality; monitoring occurs purely for the sake of collecting data or exercising control over employees. Implicit in this final category is that the information employees receive about an EPM system varies; employees may be told very little about the EPM, or may not be formally informed of its existence. While it is hard to imagine an organization would invest the significant resources to deploy EPM with no clear instrumentality, it is conceivable that an organization would limit the amount of information made available about the EPM. McNall and Roch (2009) found that providing an explanation for EPM fosters perceptions of informational justice in employees, which leads to increased trust in management, and ultimately results in increased job performance and job satisfaction.

Ravid et al.'s (2020) typology is useful for categorizing work-related purposes

for using EPM, but overlooks an important, rapidly expanding category of purposes facilitated by wearable devices: employee health and wellness. Health and wellness programs generally involve measuring or reporting nonwork behaviors for organizational purposes, occupying the liminal space between work-related and nonwork-related monitoring (e.g., Brakenridge et al., 2016; Harwell, 2019; Kaiser Family Foundation, 2018). An example of this type of monitoring is the Ovia pregnancy tracking app, which employees can use to track a variety of pregnancy-related health data (e.g., body temperature, which can be indicative of ovulation) to facilitate family planning, fertility counseling, and early identification of health risks for the mother and baby (Harwell, 2019). The espoused benefit of Ovia and similar wellness programs is increased wellness and reduced medical expenses for employees, which also translates into lower expenses for organizations. Employers can incentivize the use of this application in a variety of ways (e.g., $1 of credit per daily login, insurance premium discounts), and in turn, Ovia can provide employers with de-identified, aggregated data on their employees' health to aid in workforce planning and to optimize medical benefit coverage.

The present research compares three purposes for which organizations can deploy wearable monitors, focusing on the utility, or *benefit* of the program to various entities. Implicit in these comparisons is the assumption that organizations will not expend the considerable resources required to create and maintain an EPM program with no clear benefit (cf. Ravid et al., 2020; see also Tomczak & Behrend, 2019). Ostensibly, the most direct beneficiary of an EPM program will be the organization, but with the

increasing usage of wearables as a platform for monitoring, employees arguably stand to directly benefit from being monitored more than the organization in some cases. For example, the Fujitsu Vital Sensing Band (Fujitsu, 2017) enables monitoring of employees' well-being while they are conducting fieldwork, so that if they fall from a significant height or succumb to heat exhaustion, the organization will be notified automatically and can dispatch emergency services to the employee. While the organization benefits in a number of ways, the employees being monitored stand to benefit the most in cases where being monitored makes a difference between living and succumbing to potentially fatal injuries. Although there are conceivably benefits to other entities (e.g., customers, governments), the most germane entities are organizations and employees. Thus, although the utility of an EPM program can be understood as a continuous variable, three distinct categories emerge: EPM programs that primarily benefit organizations, programs that primarily benefit employees, and programs that benefit both organizations and employees.

The rationale behind the deployment of EPM and how that rationale is communicated to employees can have a significant impact on how employees evaluate the program and react to being monitored (Stanton, 2000b; Wells et al., 2007). Thus, individuals may perceive a wearable monitoring program as an invasion of their privacy and convey a lack of enthusiasm to participate, or more extremely, contemplate leaving the organization (Stanton & Stam, 2006). A "favorable" set of employee outcomes would therefore include enthusiasm to participate in a program, low levels of intentions to quit, and perceptions of invasion of privacy.

Hypothesis 1: A wearable program that collects data from employees primarily to benefit the organization will be associated with (a) less enthusiasm to participate in the program, (b) stronger perceptions of invasion of privacy, and (c) higher levels of intent to quit than a program that collects data primarily to benefit employees.

1.1.3. EPM Characteristics

Beyond the stated purpose for the monitoring, EPM may also differ on whether employees' participation is discretionary. Ravid et al. (2020) identify this characteristic as "target control," and Stanton (2000a) identifies this characteristic as "controllability." In essence, employees may have some control over the onset and termination of EPM, or may be able to opt-out of being monitored altogether. For example, in many police departments, officers are required to wear body cameras as a matter of policy; thus, employees have no discretion to participate in the monitoring. However, depending on the specific model of camera used, officers have the ability to manually start or stop recording, although the department generally has a policy dictating when monitoring should occur. Other organizations have voluntary "Bring Your Own Wearable" (BYOW) programs, where employees have more control. The purpose of BYOW programs varies, but frequently these programs exist as part of employee well-being programs (e.g., using a personal FitBit as part of a BYOW employee well-being program). Salesforce (2015) reported that 54% of 500 surveyed companies reported they currently have a BYOW policy in place, with an additional 40% expecting to have a BYOW policy in the near future. Generally, programs that exert more control over

employees (e.g., mandatory programs) seem to be reacted to less favorably than programs that exert less control over employees (Stanton & Stam, 2006).

Hypothesis 2: A mandatory wearable program will be associated with (a) less enthusiasm to participate in the program, (b) stronger perceptions of invasions of privacy, and (c) higher levels of intent to quit compared to a voluntary program.

1.2. Concern for Information Privacy and EPM

An additional consideration that has yet to be fully explored is individual employees' concerns for information privacy (Smith et al., 1996). In Stanton's (2000a) framework, reactions to (1) the justification of a monitoring program and (2) the discretion employees have to participate are moderated by individual differences. Specifically, Stanton (2000a) identifies baseline beliefs, locus of control, and aptitude as examples of relevant individual differences. Another potentially relevant individual difference is concern for information privacy.

Smith et al. (2011) state that definitions of privacy can be broadly classified into one of two categories: value-based (i.e., as a commodity or right) or cognate-based (i.e., as a state or form of control). In line with a definition of privacy as a form of control, Stone et al. (1983) define information privacy as "the ability (i.e., capacity) of the individual to control personally (vis-a-vis other individuals, groups, organizations, etc.) information about one's self" (p. 460). Concern for information privacy could therefore be understood as a general apprehension about threats to one's ability to control one's own information. Smith et al. (1996) conceptualize concern for information privacy as a multidimensional construct composed of several attitudes concerning the acquisition,

retention, fidelity, and use (and misuse) of data. Concern for information privacy is conceptualized as a trait; it is an overarching, context-independent (cf. Alge et al., 2006) disposition towards organizational information privacy practices. The moderating effect of concern for information privacy on the relationship between a monitoring program's purpose and individuals' reactions to the monitoring program is not something that has been explicitly explored.

In sum, it is proposed that concern for information privacy is an indirect indicator of the amount of control an individual perceives that they have over their information, and that individuals who have higher baseline levels of concern for information privacy will report more negative outcomes to being monitored irrespective of other attributes of a monitoring program. This reaction stems from the expectation that individuals will react negatively to programs that exert control over them (Stanton & Stam, 2006).

> *Hypothesis 3*: There will be a negative relationship between concern for information privacy and (a) enthusiasm to participate in the wearable program, and a positive relationship between concern for information privacy and (b) perceptions of invasions of privacy and (c) level of intent to quit.

Further, Smith et al. (2011) note that concerns related to information privacy are constantly being adjusted, depending on contextual factors in a given situation. To the degree that privacy is a form of control individuals have, an individual's general concern for information privacy may also interact with the specifications of a wearable program (i.e., the purpose and discretion to participate) to facilitate the reported outcomes. This interaction is also consistent with Stanton's (2000a) framework, wherein individual

differences moderate links between monitoring program specifications and employee reactions.

Hypothesis 4: Concern for information privacy will moderate the relationship between the wearable program purpose and (a) enthusiasm to participate in the program, (b) perceptions of invasion of privacy, and (c) intent to quit, such that individuals who report more concern for information privacy will report stronger associations than individuals who report less concern for information privacy.

Hypothesis 5: Concern for information privacy will moderate the relationship between the discretion to participate in the wearable program and (a) enthusiasm to participate in the program, (b) perceptions of invasion of privacy, and (c) intent to quit, such that individuals who report more concern for information privacy will report stronger associations than individuals who report less concern for information privacy.

2. STUDY 1

The primary objective of Study 1 is to examine how simulated employees react to organizational wearable monitoring programs. Specifically, Study 1 focuses on three key antecedents: the wearable program's purpose (Hypothesis 1), whether participation in the program is discretionary (Hypothesis 2), and individuals' concern for information privacy (Hypothesis 3). Additionally, Study 1 also investigates the potential interactive effects of concern for information privacy on the relationships between the purpose of the wearable program (Hypothesis 4) and whether employees' participation is discretionary (Hypothesis 5) on simulated employees' reactions to the program. A summary of the expected relationships is shown in Figure 2.

2.1. Study 1 Method

2.1.1. Participants

Participants were recruited to complete a web-based study using Amazon's Mechanical Turk (MTurk). In order to participate, MTurk workers must have been employed full-time in the United States and over the age of 18. Power analysis ($\alpha = .05$, $1-\beta = .80$) indicated a sample of 310 participants would be needed, assuming a small-to-medium effect size ($f = .16$). Approximately 20% additional participants ($n = 62$) were sought to account for participants who generate low-quality data. The study was completed by 376 individuals.

Prior to analyzing the data, the dataset was systematically screened for low-quality data (DeSimone & Harms, 2018; Meade & Craig, 2012). Specifically, participants who failed two or more instructed response items ($n = 42$) were removed

first. Following this, participants who generated invariant response patterns (i.e., selecting the same response option) across two measures on the same page of the survey (n = 22) were removed. Participants who failed only one attention check or generated invariant response patterns within only one measure were then manually screened for nonsense responses in open-response items in the study (e.g., job title, type of wearable device owned, job tenure that exceeded age). An additional 35 participants were removed during this manual review. Lastly, two participants were removed during a statistical check for outliers on three measures included in the study, two of which were on the same page (Mahalanobis distance; Meade & Craig, 2012). Specifically, participants were removed if results indicated that they were an outlier on at least two of the measures examined, using a threshold of $p < .001$. After all detected sources of low-quality data were removed, the final sample consisted of 275 participants.

The mean age of participants was 34.30 (SD = 11.11), 58% (n = 160) identified as male, and 66% (n = 183) identified as White. Participants primarily worked in the private sector (n = 207) and reported a mean tenure of 5.60 years (SD = 6.50) in their current position. Data about participants' wearable device ownership and usage were also captured. A majority of participants (n = 245) reported owning at least one wearable device; of those that owned a device, 70 participants reported owning two or more devices. Most participants reported wearing their devices daily both at work (n = 153) and outside of work (n = 168). Lastly, 25% of participants (n = 70) reported that their employer has a program through which they provide employees with a wearable device (n = 48) or provide a discount for a wearable device (n = 22).

2.1.2. Materials and Procedure

The present study utilized a 3 (device purpose) × 2 (discretion to participate) within-subjects experimental design. After completing demographic and individual difference items, all participants read three vignettes (see Appendix C) that described a real-world use of a wearable device in the workplace. Best practice recommendations from Aguinis and Bradley (2014) guided the design of the vignette protocol (e.g., choosing a within-person design, utilizing a sample of working adults as opposed to a convenience sample, using appropriate analyses for within-person designs, the inclusion of vignettes in the appendices), and the selection of measures. Vignette #1 contained a description of a device used to gather physiological data (heart rate, blood pressure) that enables managers to infer stress levels in nurses, which they would use to inform the scheduling of overtime hours. Vignette #2 described a device that gathered sociometric data (number and length of interpersonal interactions, vocal tone during interactions) from bank tellers, which managers would use to evaluate team effectiveness and inform team-oriented interventions. Vignette #3 described a device that would gather a variety of data (heart rate, body temperature, atmospheric pressure, acceleration) to monitor powerline technicians' well-being when they are outside, so that managers would be able rapidly respond to employees experiencing a medical emergency common in the field (e.g., heat exhaustion, falls from significant heights). Participants were instructed to read each vignette, imagine themselves as an employee in the hypothetical organization, and respond to two sets of three attitudinal variables. In the first set of attitudinal variables, participants were asked to respond as if the organization required them to participate in

the described wearable program; in the other, participation in the device program was voluntary.

To provide support that participants perceived that each vignette differed in how beneficial each scenario was for them, they were also asked to rate how much they agreed with the statement that the device would be personally beneficial for them on a Likert scale that ranged from 1 (strongly disagree) to 5 (strongly agree). Repeated-measures analysis of variance (RM-ANOVA) and follow-up pairwise comparisons indicated that participants' perceived personal benefit for each vignette was significantly different from the other two, $F(1.85, 506.11) = 143.19$, $p < .05$, $\eta_p^2 = .34$. Consistent with expectations, the employee well-being purpose wearable program (i.e., vignette #3) was regarded as the most personally beneficial ($M = 3.80$, $SD = 0.93$), followed by the mixed-purpose program (i.e., vignette #1; $M = 3.31$, $SD = 1.07$). The administrative purpose wearable program (i.e., vignette #2) was perceived as the least personally beneficial ($M = 2.52$, $SD = 1.16$).

2.1.3. Measures

2.1.3.1. Concern for information privacy

Concern for information privacy was measured using an adapted version of the CFIP measure developed and validated by Smith et al. (1996). The CFIP measure comprises 15 items distributed across four scales that measure individuals' concerns with data collection, errors, unauthorized secondary use, and improper access. Due to the length of the experiment that followed, the item with the lowest factor loading from each of the four subscales, as reported in Smith et al. (1996), was not administered. Smith et

al. (1996) also used a 7-point Likert scale, whereas in the present study, participants were asked to indicate the extent to which they agreed or disagreed with each statement using a Likert scale that ranged from 1 (strongly disagree) to 5 (strongly agree) to avoid having multiple response measures that varied in length. Example items included "It usually bothers me when companies ask me for personal information" (collection) and "Companies should devote more time and effort to verifying the accuracy of information gathered from wearable devices" (errors). The adapted measure demonstrated a respectable level of reliability ($\alpha = .90$).

To provide validity evidence for the adapted measure (Heggestad et al., 2019), a confirmatory factor analysis was conducted using the factor structure described by Smith et al. (1996). Results indicated that the model was an acceptable fit, with $\chi^2(38) = 94.08$, $p < .01$; RMSEA = .074; CFI = .96; SRMR = .045. The χ^2 test indicates that the model does not perfectly fit the data, but inspection of fit indices indicated the model is an acceptable fit. The RMSEA and SRMR values were below .08 and .05, respectively, indicating an acceptable fit, and the CFI value was above .95, indicating a good fit (Kline, 2016).

2.1.3.2. Dependent variables

Because participants completed the dependent variables six times, single-item measures of enthusiasm to participate, intentions to leave, and perceptions of privacy invasion were used as measures of participants' attitudes about a hypothetical organizational wearable program. Participants rated the extent to which they agreed or disagreed with each statement on a 5-point agreement scale (1 = strongly disagree, 5 =

strongly agree).

2.2. Study 1 Results

To test the hypothesis that wearables that collect data primarily to benefit the organization would result in less favorable outcomes (Hypotheses 1a-c), a repeated-measures MANOVA (RM-MANOVA) was conducted in SPSS v24 to identify differences across the three vignettes. RM-MANOVA revealed significant differences in responses, Wilk's $\Lambda = 0.63$, $F(6, 1092) = 47.12$, $p < .05$, $\eta_p^2 = .21$. Shown in Table 1, follow-up univariate tests indicated wearable purpose had a significant effect on: (a) enthusiasm to participate, $F(1.85, 506.24) = 141.71$, $p < .05$, $\eta_p^2 = .34$; (b) perceived invasion of privacy, $F(1.91, 522.72) = 85.99$, $p < .05$, $\eta_p^2 = .24$; and (c) quit intentions, $F(1.80, 493.56) = 78.41$, $p < .05$, $\eta_p^2 = .22$. Bonferroni post-hoc tests revealed all possible paired vignette comparisons within each condition were significantly different from each other ($p < .05$). Participants reported the least favorable outcomes for the wearable program that had an administrative purpose (i.e., vignette #2), and the most favorable outcomes for the wearable program that had an employee well-being purpose (i.e., vignette #3); descriptive statistics are presented in Table 2, and a comparison of the outcomes is presented in Figure 3. Thus, Hypotheses 1a-c were supported.

Paired-sample *t*-tests were used to test the hypothesis that mandating participation in a wearable program would result in less favorable outcomes (Hypotheses 2a-c). Results from these *t*-tests are summarized in Table 2. Consistent with Hypothesis 2, participants reported (a) less enthusiasm to participate, (b) a greater perceived invasion of privacy, and (c) stronger intentions to turn over when participation in the

wearable program was framed as being required, rather than voluntary. This effect was significant ($p < .05$) for all three dependent variables, with effect sizes ranging from $d =$ 0.10 to $d = 0.37$. Thus, Hypotheses 2a-c were supported.

To test the hypothesis that CFIP is negatively associated with favorable outcomes (Hypotheses 6a-c), a linear regression was conducted for each outcome variable; results are presented in Table 3. Results indicated that participants who reported more CFIP were more likely to perceive that their privacy has been invaded by a workplace wearable program, $\beta = .22$, $p < .05$. However, CFIP was not associated with turnover intentions or enthusiasm to participate. Thus, Hypothesis 3b was supported, but Hypotheses 3a and 3c were not supported.

To test the hypothesis that CFIP would moderate the relationship between device purpose and employee reactions (Hypotheses 4a-c), multiple generalized linear mixed-effects regression analyses were conducted in R (R Core Team, 2017). Simple slopes, intercepts, and associated tests of significance are presented in Table 4 and plotted in Figure 4. Results indicated that there was a significant interaction between CFIP and device purpose for all outcomes. Presented in Table 5, chi-square difference tests (Kline, 2016) for each outcome indicated that models which included the interaction between CFIP and device purpose fit the data better when compared to models containing only the simple effect of device purpose. The overall effect of device purpose on outcomes of interest was more pronounced when participants reported more CFIP than when participants reported less CFIP; thus, Hypotheses 4a-c were supported.

The same method was used to test the hypothesis that CFIP would moderate the

relationship between discretion to participate and outcomes (Hypotheses 5a-c), substituting device purpose for discretion to participate. Simple slopes, intercepts, and associated tests of significance are presented in Table 6 and plotted in Figure 5. Results indicated that there was a significant interaction between CFIP and discretion to participate when predicting turnover intentions and enthusiasm to participate but not perceived invasion of privacy. Follow-up chi-square difference tests (see Table 7) between a model containing only the simple effect of discretion to participate and a model adding the interaction indicated that the models containing the interaction better fit the data than the simple effect model for turnover intentions and perceived invasion of privacy, but not for enthusiasm to participate. Thus, Hypotheses 5b and 5c were supported, but Hypothesis 5a was not supported.

2.3. Study 1 Discussion

The results of Study 1 suggest that the purpose of a wearable program and the amount of discretion employees have to participate are related to how favorably simulated employees react to that program, as conveyed in employment-related outcomes. In line with the assertions made in Stanton and Stam (2006), administrative programs were viewed less favorably than programs with a partial or complete focus on employee well-being. Contrary to expectations, CFIP did not have a direct relationship with turnover intentions or enthusiasm to participate in a wearable program; however, it did have a significant relationship with the perceived invasion of privacy of a wearable program. A summary of the support for Study 1 Hypotheses can be found in Table 8.

Logically, it seems that having more CFIP would manifest as an aversion to any

form of monitoring program; however, having more CFIP did *not* result in unambiguously negative reactions. Instead, programs that elicited favorable reactions were rated significantly *more* favorably when an individual had more CFIP, and programs that received negative reactions were rated significantly more negatively. This supports the notion that privacy is a function of different situational variables (Smith et al., 2011), and that the relationship between a monitoring program's purpose and individuals' reactions to monitoring programs is moderated by individual differences (Stanton, 2000a).

Lastly, although the materials and hypothesized relationships draw clear distinctions between a purpose that primarily benefits employees and a purpose that primarily benefits the organization, purposes in the real world are not always so neatly defined. This reality led to the inclusion of Vignette #1 (where the wearable device's purpose was monitoring stress to assist with work scheduling), which serves as an exploratory "middle ground" where a primary beneficiary is more ambiguous. As described earlier, RM-MANOVA and follow-up pairwise comparisons indicated that there was a significant difference in outcomes between the three vignettes. Seen in Table 2 and Figure 3, the mean of each outcome for the ambiguous stress and scheduling purpose is bounded by the mean outcomes for the employee well-being purpose and the team effectiveness purpose. Put another way, when the primary beneficiary is ambiguous, the mean of each outcome is more favorable than when the organization is the primary beneficiary, but less favorable than when the employee is the primary beneficiary. Further, as seen in Table 4 and Figure 4, the effect of the stress and

scheduling purpose on enthusiasm to participate and turnover intentions is not influenced by CFIP.

The purpose of Study 1 was to gather some initial descriptive data on the use of wearables in the workplace and to experimentally manipulate the purpose of the wearable program and employees' discretion to participate in order to examine their respective influence on respondents' reactions to the programs. The design of the manipulations does not permit teasing apart the influence of the type of device, data collected from the device, and the hypothetical job of individuals wearing the device. Correspondingly, each of these wearable program characteristics is examined separately or held constant in Study 2.

3. LOOKING BEYOND EXISTING EMPLOYEES

The focus of Study 1 was the experience of current employees, similar to the vast majority of EPM studies available in the extant literature (Karim et al., 2014). For the general public, the tension between large-scale monitoring for commercial purposes and individuals' privacy concerns continues to grow with each passing day (Bhave et al., 2020). Prior to their employment with a particular organization, individuals must first engage the organization to express their interest in employment, beginning an exchange of information between the prospective employee and the organization. As individuals move through this process, they form opinions about the job and the organization based on the information they receive (Dineen & Soltis, 2011). Thus, it would seem useful to consider that job applicants may also have meaningful reactions to an organization's use of wearable monitoring programs during the application process.

3.1. Applicant Privacy

In an interdisciplinary review of workplace privacy theories and research, Bhave et al. (2020) propose that there are three stakeholders in the employment relationship: employers, employees (and applicants), and society-at-large. They note that these stakeholders have different interests in employees' privacy, and that these interests are rarely compatible. Thus, forming an employment relationship consists of a number of privacy-related trade-offs, which factor into each stakeholder's "privacy calculus" (Bhave et al., 2020). With the advent of widespread internet access, for example, many employers have elected to use unproctored remote assessments as part of the selection process (Lievens & Harris, 2003). Employers have largely transitioned to this mode of

assessment because of the cost-savings, speed, and ease of access for applicants (Tippins, 2009). However, with these benefits come the potential for increased cheating, which some employers have responded to by implementing proctored remote assessments (Tippins, 2009). For test-takers, the presence of these proctors is associated with more privacy concerns (d = 0.87; Karim et al., 2014). Thus, job applicants must decide whether the benefit of possibly receiving a job offer outweighs their concern for privacy when moving through the selection process.

3.1.1. Applicant Privacy and the Selection Process

In order to be considered for a given job, individuals must submit information about their qualifications for the job (i.e., complete a job application). Frequently, the organization will require additional information as applicants move further into the selection process. Whereas they may provide basic information upon applying, more qualified applicants are generally subject to further procedures, such as an interview or testing. Occasionally, applicants may be asked to provide information about their social media usage, or even to provide passwords to social media accounts so that employers can review their activity (Stoughton et al., 2015). Upon receiving a tentative offer of employment, applicants may be asked to provide further information, such as a drug screening, criminal background check, or credit check. Thus, at multiple points during the application process, applicants are asked to surrender private information to the organization in varying degrees in exchange for the potential value that would be provided by entering into an employment relationship with the organization (Bhave et al., 2020).

3.1.1.1. Invasiveness and the What, How, and Why of Selection Procedures

During the selection process, applicants are typically assessed on a number of constructs, and through a number of methods. One of the most common methods that applicants will encounter during the selection process is a job application, in which applicants are asked to provide their employment history and other biodata (presumably) related to the job they are seeking. Even during this early stage of the process, applicants may be faced with the choice of skipping a question in the application that they find to be invasive (e.g., criminal history), which would likely reduce their chances of continuing in the process (Stone & Stone, 1987). This potential penalty for failing to provide information is noteworthy, specifically because there is some evidence to suggest that there are demographic differences in how invasive biodata items are perceived to be. Rosenbaum (1973) found that women tended to perceive biodata items related to their interests, social adjustment, and employment history as more invasive. Mael et al. (1996) similarly suggest that women may be more likely to perceive many biodata items as being more invasive, and also found that White individuals tended to view biodata items as less invasive. Despite these differences, application blanks were generally regarded as the least invasive of 12 selection methods evaluated by Stone-Romero et al. (2003), ranking just below the job interview.

Job interviews are another method that applicants frequently encounter in the selection process, during which they are assessed across a wide range of constructs, which may not always be clearly delineated (Arthur & Villado, 2008). To this point, although Stone-Romero et al. (2003) found that application blanks and job interviews

were two of the least-invasive selection procedures, the specific construct(s) that the application blanks and interviews were described to be measuring were unclear. Perceived invasiveness of different methods seems to be inversely related to their job-relatedness (Thibodeaux & Kudisch, 2003), indicating that application blanks and interviews are generally assumed to be job-related. That being said, it is conceivable that given the variety of information employers may be interested to learn about applicants, either of these methods may actually be quite invasive; therefore, it would seem prudent to judge the perceived invasiveness of a given method not by the method itself, but also on the information being requested of the applicant, and the characteristics (e.g., job-relatedness) of that information. Indeed, Bhave et al. (2020) note that applicants' information privacy concerns focus on the content or type of information being requested (i.e., the what), the method used to request that information (i.e., the how), and the reason that the information is being requested (i.e., the why).

For example, Stone-Romero et al. (2003) found that honesty tests were perceived to be significantly more invasive than work samples, interviews, and application blanks. Similarly, Anderson et al. (2010) reported meta-analytic evidence that of 10 different selection procedures, honesty tests were generally regarded as the least respectful of privacy. Honesty tests are generally designed to measure attitudes towards and beliefs about antisocial or dishonest behaviors (e.g., theft and other illegal activities). Dwight and Alliger (1997) found that integrity test items specifically related to admitting past dishonest behaviors were perceived to be the most invasive. Although application blanks were found to be the least invasive selection procedure overall (Stone-Romero et al.,

2003), application blanks related to criminal background have been specifically identified as being invasive (Stone & Stone, 1987), further supporting the notion that the invasiveness of different selection procedures should be evaluated on the constructs they measure, specifically when methods are generally used to measure multiple constructs.

Separate, but related to the issue of integrity, is the detection of possible deception when providing answers to specific questions during the selection process. The primary tool used to detect deception in these cases is a polygraph test, though the use of polygraphs is restricted to jobs with specific legal exemptions (e.g., security services; Application of the Employee Polygraph Protection Act of 1988, 1991). Polygraph tests are purported to augment other methods (e.g., interviews) by decreasing construct-irrelevant variance (i.e., deception), while also measuring applicants' honesty; the validity of these claims, however, is questionable (Iacono & Lykken, 1997). Perhaps unsurprisingly, Stone-Romero et al. (2003) found polygraph tests to be the most invasive selection procedure. Given that the use of polygraph tests is highly restricted, it is unsurprising that integrity tests have emerged as an alternative used in settings where polygraph tests are not permitted.

3.1.1.2. Background Checks

Some employers will request information related to applicants' criminal history on the initial job application. Recently, employers have restructured their selection procedure to avoid that practice, as several states have made it illegal to request that information before an applicant has been given a job offer (Cascio & Aguinis, 2018). One way employers have restructured their procedures is to incorporate honesty tests.

Applicants are likely more familiar with background checks, which are generally legal to administer after an applicant has been given a job offer, though some checks are also subject to restrictions that vary by jurisdiction. The use of background checks dates back to the 1970s, when employers began to seek information about applicants' credit history in response to an increase in the number of lawsuits filed against organizations that alleged damages due to negligent hiring (Professional Background Screening Association, n.d.). Modern background checks also include criminal arrests and convictions, as well as general biodata (Society for Human Resource Management, n.d.). The Society for Human Resource Management (SHRM; n.d.) notes that the biggest reasons organizations use background checks are to protect employees and the general public, to improve the quality of hires, as part of a regulatory or legal requirement, to protect the organization's reputation, and to reduce criminal activity. Employers may also use background checks to verify biodata provided in the job application.

Background checks could be used as indicators of applicants' integrity, and in the case of credit checks, perhaps conscientiousness (Cascio & Aguinis, 2018). Despite the strong interest organizations have in obtaining this background information, applicants have been found to perceive them as being more invasive than job applications, interviews, work samples, physical and mental ability tests, and personality inventories (Stone-Romero et al., 2003). Although this comparison should be cautiously interpreted for the reasons listed above, inquiries related to credit history and integrity are generally perceived to be more invasive than inquiries related to educational or professional background, as an example (Mael et al., 1996). Despite that, Nielsen and Kuhn (2008)

note that organizations may be able to mitigate applicants' privacy concerns to some degree by being transparent with the credit check process, and clearly disclosing how applicants' data will be safeguarded.

Background checks may also reveal past drug use, which is another contentious type of information that employers may be interested in during the selection process. Arthur and Doverspike (1997) note that different types of drug testing have varying degrees of utility and validity, and similar to background checks, they may be seen as intrusive by applicants, yet reasonable to employers. Stone-Romero et al. (2003) found that biochemical drug testing was perceived to be as invasive as general background checks and honesty tests. In addition to being perceived as being highly invasive, Stone-Romero et al. (2003) report that one shared attribute among all three of these procedures is that they imply that employers distrust applicants; only polygraphs implied more distrust and resulted in more perceived invasiveness.

3.1.1.3. The Use of Social Media in Selection Procedures

Within the last decade, the use of social networking websites (e.g., Facebook, LinkedIn) has gained popularity as a new tool that can be used in selection (Ryan & Ployhart, 2014). Functionally, employers generally use these websites similarly to a background check–the goal being to uncover information that may be relevant to the employer, such as evidence that the applicant has engaged in illegal or inappropriate behaviors (Karl et al., 2010). Some employers may also use information from social networking websites to search for predictors of future performance, such as information about applicants' hobbies, or even to assess specific personality traits (Van Iddekinge et

al., 2016). Ployhart et al. (2017) note that as novel data analytic techniques are developed or improved, the use of nontraditional predictors (e.g., social networking websites) may increase, perhaps even before the questions of the job relevancy or invasiveness of these predictors are resolved. Notably, despite the widespread use of social networking websites as a screening tool, this method is not as heavily regulated or standardized as background checks and may pose significant ethical and legal risks to employers if used improperly (Weathington et al., 2018).

From the applicant's perspective, they may not even be aware that the employer uses this information. Hiring managers may simply use a search engine (e.g., Google) to find publicly viewable information on applicants' social network profiles, and may make hiring decisions based on that information without notifying applicants (Van Iddekinge et al., 2016). In a more formal use of social networking websites, employers may go as far as requiring passwords to applicants' accounts, or requiring that applicants add an agent of the employer to their social network (Roulin, 2014). Suen (2018) found that employers' use of information from social networking websites was positively associated with perceived privacy violations in applicants ($\beta = 0.56$; $R^2 = .85$). Further, Suen (2018) found that both employers' use of this information and applicants' perceived privacy violation were negatively associated with perceived procedural justice ($\beta = -0.14$ and -0.75, respectively; $R^2 = .62$), which in turn was negatively associated with application withdrawal intentions ($\beta = -0.83$; $R^2 = .69$).

3.1.2. Applicant Privacy and EPM

Karim et al. (2014) note that while applicant reactions to proctored assessments

have not been studied extensively, the study of employee reactions to EPM provides a solid foundation to build on, and that the link between EPM and applicant reactions warrants further study. Stanton's (2000a) model, and most EPM research, assumes that individuals reacting to an EPM program are current employees in the organization implementing the program. However, one does not necessarily need to be an active employee of an organization to gain awareness of such programs; they could learn about it second-hand from a friend who works in the organization, during the recruitment process, or when researching an organization on the internet. Numerous examples of organizations' use of EPM exist in the popular press (e.g., Harwell, 2019; Rowland, 2019; Walker, 2021). Exploring publicly available information about a company is common and recommended during the job search process; potential applicants regularly use the internet to search for information not only about a job they are interested in, but about the organization that posted the job (Breaugh, 2013). Therefore, information pertaining to the deployment of EPM in an organization is expected to influence an applicant's evaluation of the job and the organization. Correspondingly, an organization's use of EPM is expected to relate to applicant attraction and job pursuit intentions, which are two common applicant reactions studied in the recruitment literature (Dineen & Soltis, 2011).

Extensive research in the recruitment domain has identified the variables that relate to applicant attraction to an organization. Beyond an applicant's evaluation of the degree to which they will fit in the organization, job and organizational characteristics are the two strongest predictors of applicants' attraction to an organization (Uggerslev et

al., 2012). Job characteristics refer to the applicant's evaluation of the aspects of a position, whereas organizational characteristics refer to the candidate's evaluation of different aspects of the organization (Uggerslev et al., 2012). EPM can be considered either a job or organizational characteristic, depending on whether it is deployed to all employees or only those in certain jobs. The increasing implementation of body-worn cameras in policing also presents a clear example of how EPM can affect both the job itself (i.e., police officer) and the image of the organization (i.e., police department) for both employees and non-employees (Adams & Mastracci, 2019). As societal consciousness of EPM and the salience of information privacy increase, it is conceivable that the implementation and use of EPM in organizations will continue to be "newsworthy" information, and as a result, influence job seekers' perceptions of the characteristics of jobs and organizations. Similar to employees' reactions, applicants will react less favorably to EPM that benefits organizations than EPM that benefits employees.

> *Hypothesis 6*: A wearable program that collects data from employees primarily to benefit the organization will be associated with (a) less organizational attraction and (b) weaker job pursuit intentions than a program that collects data primarily to benefit employees.

3.2. Beyond Autonomy: Self-Determination Theory and EPM

Deci and Ryan (1985) propose that human beings have three universal basic psychological needs: autonomy, relatedness, and competence. The need for autonomy can be understood as individuals' need to originate and feel in control of their actions, as

opposed to being controlled or pressured by outside forces (Ryan & Deci, 2008). The need for competence is individuals' need to feel effective in their actions, and to have opportunities to demonstrate and develop what they are capable of (Ryan & Deci, 2008). Relatedness refers to individuals' need to feel connected with others and have a sense of belonging within their community (Ryan & Deci, 2008). Self-determination theory (SDT; Deci & Ryan, 1985) is a cluster of related theories that model how individuals interpret the world around them and engage in behaviors in order to satisfy these needs. Individuals will pursue activities that fulfill these needs and try to avoid activities that undermine these needs (Ryan & Deci, 2000). Put another way, SDT is a needs-based theory of motivation that asserts individuals will be motivated to perform actions based on their assessment of their needs at a given point, and the likelihood of an action to either satisfy or frustrate fulfillment of those needs.

Although SDT was developed as a broad theory of motivation by social psychologists, there have been several narrower investigations that examine SDT in more specific domains. Specifically, educational psychology (e.g., van der Kaap-Deeder et al., 2017), sports psychology (e.g., Hagger & Chatzisarantis, 2007), and organizational psychology (Gagné & Deci, 2005) have all made substantial use of SDT to explain different domain-specific motivations and behaviors. A wide range of measures has been developed to assess needs as well. In addition to measures used as part of a cross-sectional study (e.g., Deci et al., 2001), there are daily diary measures (e.g., van der Kaap-Deeder et al., 2017) which capture day-to-day within-person variance of needs satisfaction. The varied instructions embedded in these measures indicate that need

satisfaction has the potential to change whenever new information about the context is made available. Put another way, individuals regularly evaluate the degree to which different situations and actions will satisfy their needs, and are motivated to perform actions that they *anticipate* will lead to the fulfillment of their needs. Gagné and Deci (2005) note that motivation is a state, driven by the degree to which an activity and the surrounding context will satisfy one's needs for autonomy, competence, and relatedness.

Prior reflections and investigations of EPM have focused primarily on individual autonomy and control, ignoring the needs for relatedness and competence (e.g., Stanton & Barnes-Farrell, 1996; Stanton & Stam, 2006). This deficiency limits interpretations of individuals' reactions to monitoring–while autonomy is certainly important, it is only one need that individuals strive to satisfy. Cascio and Montealegre (2016) propose that to have a complete understanding of whether technology will leave employees feeling enabled or oppressed, all three basic psychological needs should be examined (see also Montealegre & Cascio, 2017). Venkatesh and Bala (2008) also note the importance of considering intrinsic motivation when evaluating employees' technology acceptance, in addition to the perceived discretion employees have in using a given system.

It is possible that the importance of employees' other needs is made somewhat more apparent with wearable monitoring programs, given the range of possible monitoring purposes and the increased mobility of wearables as a monitoring platform. Wearable sensors are now able to capture physiological data, facilitating the monitoring of employees' safety and well-being by the organization. As a result, employees may feel that their organization cares more for them by monitoring their well-being, even if

they have no control over whether they are being monitored. For example, a mandatory monitor that is worn to facilitate an emergency response if an employee falls or suffers from heat exhaustion (e.g., Fujitsu, 2017) could be received favorably by employees, because it implies that the organization cares about their well-being. Consistent with this, perceived organizational support is a well-validated psychological construct that has been shown to have robust positive relationships with several important outcomes, including job performance, organizational citizenship behavior, and employee well-being (Kurtessis et al., 2017). Further, Tomczak et al. (2020) found that generally, individuals do not have high levels of acceptance for physiological monitoring; however, for those that do find physiological monitoring acceptable, 62% find it acceptable to keep them safe. Thus, mandatory monitors over which employees have no control may satisfy employees' need for relatedness, which in turn leads to positive reactions to the monitoring program, as opposed to the negative reactions one might expect when considering autonomy or control.

Wearable devices are not just sensors, though; they often contain visual or auditory displays and interfaces. Therefore, wearable monitoring programs can also facilitate feelings of competence by augmenting employees' performance on the job by presenting task-relevant information, in addition to monitoring the employee. Wearable devices can also provide immediate access to continuous performance feedback via visual or auditory displays, which can also facilitate feelings of competence. Briefly summarized, the purpose for which wearable monitors are utilized are likely to contribute to an employees' need for autonomy, but the degree to which needs for

relatedness and competence are fulfilled by EPM has not been previously tested, to the best of the author's knowledge.

Hypothesis 7: Anticipated satisfaction of the basic needs for (a) autonomy, (b) relatedness, and (c) competence will vary between different wearable program purposes.

To the degree that employees evaluate their anticipated need satisfaction when reviewing job postings, any information which alters applicants' perception of these needs being satisfied in a job will be reflected in their overall evaluation of the characteristics of the job (Uggerslev et al., 2012). For example, EPM that monitors employees continuously in order to ensure compliance with organizational procedures might be seen as a less favorable job characteristic because it threatens employees' satisfaction of the need for autonomy, and may be reflected in a candidate's evaluation of how attractive the organization is and their intentions to pursue the job. Conversely, a program that monitors employees to ensure their personal safety in a high-risk job might be a more favorable job characteristic because it facilitates employees' satisfaction of the need for relatedness (i.e., they feel cared for), and may result in higher levels of organizational attractiveness and job pursuit intentions.

Hypothesis 8: Anticipated satisfaction of the needs for (a) autonomy, (b) relatedness, and (c) competence will partially mediate the relationship between applicants' awareness of an organization's wearable program and organizational attraction, such that awareness about an organization's wearable program will attenuate need satisfaction, thereby attenuating organizational attraction.

Hypothesis 9: Anticipated satisfaction of the needs for (a) autonomy, (b) relatedness, and (c) competence will partially mediate the relationship between applicants' awareness of an organization's wearable program and job pursuit intentions, such that awareness about an organization's wearable program will attenuate need satisfaction, thereby attenuating job pursuit intentions.

3.3. Concern for Information Privacy and Self-Determination Theory

It is quite likely that concern for information privacy will also moderate individuals' evaluations of the potential for wearable monitors to be facilitative or threatening of the satisfaction of their basic psychological needs. While individual differences act as moderators of the relationship between a program's purpose and individuals' reactions to the program (Stanton, 2000a; White et al., 2020), they do not exist in a vacuum; individuals' attitudes and cognitions also mediate the relationship between a program's purpose and individuals' reactions (Stanton, 2000a). Further, these concerns must affect the evaluation of more than just the need for autonomy; otherwise, any sort of electronic monitoring should be adversely perceived, because the act of monitoring alone exerts a form of control on an individual to some degree. It may be the case that individuals who have more concern for information privacy are more sensitive to situations that may threaten satisfaction of their basic psychological needs, whereas individuals who have less concern for information privacy are less sensitive to these situations, and therefore place less weight on the monitoring purpose in their evaluation or reaction to the wearable program.

Hypothesis 10: Concern for information privacy will moderate the direct effect of

awareness of an organization's wearable program on applicant reaction outcomes such that higher levels of concern for information privacy will facilitate the effects of awareness of an organization's wearable program on (a) organizational attraction and (b) job pursuit intentions.

Hypothesis 11: Concern for information privacy will moderate the indirect effects of awareness of an organization's wearable program on organizational attraction through anticipated satisfaction of the needs for (a) autonomy, (b) relatedness, and (c) competence, such that higher levels of concern for information privacy will facilitate the indirect effects of awareness of an organization's wearable program on organizational attraction

Hypothesis 12: Concern for information privacy will moderate the indirect effects of awareness of an organization's wearable program on job pursuit intentions through anticipated satisfaction of the needs for (a) autonomy, (b) relatedness, and (c) competence such that higher levels of concern for information privacy will facilitate the indirect effects of awareness of an organization's wearable program on job pursuit intentions.

4. STUDY 2

The primary objective of Study 2 is to examine how prospective job applicants react to information about wearables in the organization to which they are applying for work. Similar to Study 1, Study 2 focuses on the wearable program's purpose (Hypothesis 6). Study 2 also investigates the relationship between the purpose of the wearable programs and psychological need fulfillment (Hypothesis 7), and the role need fulfillment plays on applicant reactions to wearable purposes (Hypotheses 8 and 9). Additionally, Study 2 also investigates the potential interactive effects of concern for information privacy on the aforementioned relationships between applicant reactions and the purpose of the wearable program (Hypotheses 10 – 12). Lastly, Study 2 also contains a baseline condition to serve as a point of comparison, where participants are presented with a job description with no information about wearable monitoring. A summary of the expected relationships is shown in Figure 6.

4.1. Study 2 Method

4.1.1. Participants

Individuals currently enrolled in undergraduate nursing programs (i.e., prospective job applicants) were invited to participate in this study. Recruitment took place in three waves between August and October of 2021. For the first two waves, recruitment emails were sent to nursing students from two local nursing programs pursuing either an associate's or bachelor's degree in nursing. Due to a less than ideal response rate (61 respondents out of approximately 410 students), an invitation was posted to the /r/StudentNurse Reddit forum to conduct a third wave of recruitment,

which invited anyone who met the criteria in the United States to participate. An additional 203 responses were collected during the third wave, bringing the total sample to 264 participants. Participants were compensated with a $5 credit to an online retailer for completing the study.

Similar to Study 1, before conducting primary analyses, the dataset was systematically screened for low-quality data (DeSimone & Harms, 2018; Meade & Craig, 2012). First, responses to three manipulation checks (see Appendix D) were reviewed. Since a failed manipulation check undermines conclusions about any responses that follow, participants who failed one of these checks were removed (n = 84). Following this, responses of three words or more to an open-ended request for feedback at the end of the study were reviewed for duplicates. For example, the response "I think the investigation is very detailed" appeared in six different responses. An additional 22 responses were identified using this criterion and were removed.

After screening for these two criteria, a "multiple hurdles" approach (Curran, 2016) was used to screen the remaining 158 responses. If a participant failed more than one of the additional checks, they were removed from the sample. First, an instructed response item (i.e., "Select 'Somewhat Disagree' for this item") was embedded partway through the study; participants who failed this check were flagged. Second, the number of minutes participants took to complete the study (M = 16.78, SD = 14.16) was reviewed, and the bottom decile was used as a cut-point to identify participants that sped through the study; ergo, participants were flagged if they completed the study in under 6 minutes. Third, possible duplicate responses indicated by survey metadata (i.e., IP

address or browser cookies) were also flagged. Fourth, inconsistent responses to a reverse-scored item in the organizational attractiveness measure also resulted in a flag. Fifth, a longstring check of a series of 112 items indicated that approximately 90% of participants provided the same response more than 12 times in succession; therefore, participants who exceeded 12 same responses were flagged. Of the remaining participants, 49% (n = 77) received no flags, 35% (n = 51) received only one flag, 15% (n = 23) received two flags, and 4% (n = 7) received 3 or more flags; therefore, an additional 30 participants were removed. The final sample consisted of 128 participants.

Participants from the first and second recruitment waves made up 41% (n = 52) of the final sample. The mean age of participants was 25.05 (SD = 4.0), 69.5% (n = 89) identified as female, and 73.4% (n = 94) identified as White. A majority of participants (n = 108; 84%) reported that they had some previous clinical experience. Lastly, 46% (n = 59) of participants reported that they would begin their job search within 6 months of participating in the study, 28% (n = 36) within 6-12 months, and 26% (n = 33) after more than 12 months.

4.1.2. Procedure

The study was delivered online via the Qualtrics survey platform. Participants first completed basic demographic questions (e.g., age, gender, months/years of clinical job experience) and the adapted version of the CFIP measure used in Study 1 (Smith et al., 1996). After completing the demographic items and individual difference measure, participants were presented with a job description and a brief overview of benefits associated with a nursing position offered at a fictional hospital (St. David's Healthcare,

n.d.). Following this, participants completed measures of their anticipated basic psychological needs satisfaction (Van den Broeck et al., 2010), job pursuit intentions, and ratings of the organization's attractiveness (Highhouse et al., 2003). Next, participants read the first of three news stories that describe employee wearable monitoring programs at the same hospital, which were modified from Business Wire (2020). As a manipulation check, participants completed a multiple-choice item to identify the purpose of the wearable program they just read about. Afterwards, participants again reported their anticipated basic psychological needs satisfaction, job pursuit intentions, and the organization's attractiveness. This process was repeated for the remaining two news stories. All three news stories were evenly presented in a random order to attenuate any order effects.

Prior to the first wave of recruitment, a sample of 10 individuals in the nursing field piloted the measures and materials, as well as provided structured qualitative feedback on the study protocol to identify potential measurement or design concerns. Feedback from the pilot study indicated that the differences between the news stories were too subtle, so some participants did not recognize that they were reading three different stories. This was remedied by adding an identifying title (e.g., "Story A") in large, bold font above each news story. Additionally, the actual text manipulation within each news story was expanded to differentiate each story further. Materials and measures can be found in Appendix D.

4.1.3. Design

The present study used a within-subjects experimental vignette design, exposing

participants to each level of the independent variable. Similar to Study 1, best practice recommendations for vignette studies outlined in Aguinis and Bradley (2014) guided the design, implementation, and data analyses of the study. The independent variable (i.e., program purpose) consists of four levels: a baseline condition with no monitoring present, an administrative purpose, a purpose that serves to improve employee well-being, and a hybrid purpose which is administrative and improves employee well-being.

A screenshot containing information about a nursing job at a fictional hospital in a nearby major city was presented to participants; information included a job description and a high-level overview of benefits. Separate from this, three news stories described different wearable programs at this hospital. These news stories described one of three purposes for the wearable programs: to monitor when employees enter a patient's room and interact with different artifacts in the room (e.g., hand sanitizer) to ensure procedural compliance (i.e., administrative purpose); to monitor employees' stress levels so supervisors can assign work based on employees' stress levels (i.e., highly stressed employees get less critical tasks or less work; mixed purpose); and to monitor employees' status and location in the hospital so supervisors can rapidly dispatch help to respond to adverse events (e.g., staff being assaulted; well-being purpose). It is worth noting that these specific purposes do not correspond to an individual psychological need; rather, they reflect realistic implementations of a wearable program.

4.1.4. Measures

4.1.4.1. Concern for Information Privacy

Concern for information privacy (Smith et al., 1996) was measured using the

adapted version of the CFIP measure used in Study 1. The adapted 11-item CFIP measure demonstrated an acceptable level of reliability (α = .78).

4.1.4.2. Anticipated Basic Psychological Needs Satisfaction

The Work-related Basic Need Satisfaction measure (Van den Broeck et al., 2010) captures the degree to which employees' basic psychological needs are being satisfied within the work context. Example items include "I feel like I can pretty much be myself at my job" (Autonomy), "At work, I feel like part of a group" (Relatedness), and "I feel competent at my job" (Competence).

This measure was adapted to conform with two design requirements for the proposed study. First, the measure was shortened from its current 21-item length to nine items, since it was administered multiple times within the study. Second, this measure was adapted to be future-oriented; that is, questions were phrased in such a way that participants responded using their understanding of a potential job, not based on their feelings about their present job (e.g., "I feel like I would be able to pretty much be myself at this job"). Participants indicated the extent to which they agree or disagree with each statement using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The adapted measure can be found in Appendix D. Items were selected based on the factor loadings reported in Van den Broeck et al. (2010); the three items with the highest loadings for each need were selected, for a total measure length of nine items. Reliability was generally poor (α = .13 - .51) for the autonomy scale, varied (α = .66 - .86) for the competence scale, and varied (α = .59 - .76) for the relatedness scale. Descriptive statistics and reliabilities for each condition can be found in Table 9.

4.1.4.3. Dependent Variables

Organizational attractiveness and job pursuit intentions were captured with ten items compiled and adapted by Highhouse et al. (2003); five items measure organizational attractiveness, and the other five measure job pursuit intentions (see Appendix D). Highhouse et al. (2003) note that previous "organizational attractiveness" measures have combined items that assess both attractiveness and intentions, despite being distinct constructs. Framing these constructs in Fishbein and Ajzen's (1975) theory of reasoned action, they argue that attractiveness is more attitudinal, whereas intentions are cognitions directed towards a future action. Accordingly, Highhouse et al. sourced and adapted five organizational attractiveness items specifically focusing on individuals' attitudes towards the company, not on future-oriented actions. For example, one of the items reads, "For me, this company would be a good place to work." Likewise, the five items selected and adapted by Highhouse et al. for job pursuit intentions focused on future-oriented actions towards the company, not attitudes. One example item reads, "I would make this company one of my first choices as an employer." For the present study, participants indicated the extent to which they agreed or disagreed with each statement using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Reliability was generally acceptable (α = .68 - .90) for the attractiveness scale and acceptable (α = .76 - .93) for the intentions to pursue scale. Descriptive statistics and reliabilities for each condition can be found in Table 9.

4.2. Study 2 Results

To test the hypothesis that wearables that collect data primarily to benefit the

organization would result in less favorable applicant reactions (Hypotheses 6a and 6b), an RM-MANOVA was conducted in SPSS v24 to identify differences across the four conditions. RM-MANOVA revealed significant differences in responses, Wilk's Λ = 0.83, $F(6, 760) = 12.43$, $p < .05$, $\eta_p^2 = .09$. Shown in Table 10, follow-up univariate tests indicated wearable purpose had a significant effect on (a) organizational attractiveness, $F(2.83, 358.78) = 23.74$, $p < .05$, $\eta_p^2 = .16$ and (b) job pursuit intentions, $F(2.59, 328.70) = 22.27$, $p < .05$, $\eta_p^2 = .15$. Bonferroni-corrected pairwise comparisons revealed all possible paired comparisons were significantly different from each other for both organizational attractiveness and job pursuit intentions ($p < .05$), except for the employee well-being × stress and scheduling pair ($p > .05$). Participants reported the least organizational attraction and job pursuit intentions for the wearable program with an administrative purpose, and the most attraction and intentions for the job description (baseline) condition. Descriptive statistics are presented in Table 9, and a visual comparison is presented in Figure 7. Being that the administrative purpose condition resulted in less organizational attractiveness and fewer job pursuit intentions than each of the other conditions (employee well-being, stress and scheduling, and baseline), Hypotheses 6a and 6b were supported.

Similar to Hypothesis 6, RM-MANOVA in SPSS v24 was used to test the hypothesis that anticipated basic psychological need satisfaction would vary between wearable program purposes (Hypotheses 7a-7c). RM-MANOVA revealed significant differences in responses, Wilk's $\Lambda = 0.83$, $F(9, 922.54) = 8.15$, $p < .05$, $\eta_p^2 = .06$. Shown in Table 11, follow-up univariate tests indicated wearable purpose had a significant

effect on the needs for: (a) autonomy, $F(2.76, 350.21) = 18.35$, $p < .05$, $\eta_p^2 = .13$; (b) competence, $F(2.69, 341.60) = 13.11$, $p < .05$, $\eta_p^2 = .09$; and (c) relatedness, $F(3, 381) = 6.79$, $p < .05$, $\eta_p^2 = .05$. Bonferroni-corrected pairwise comparisons revealed that the administrative purpose condition resulted in less anticipated satisfaction of the need for autonomy than any of the other three conditions ($p < .05$); no other significant differences were found for autonomy ($p > .05$). The baseline condition resulted in more anticipated satisfaction of the need for competence than all other conditions ($p < .05$); no other significant differences were found for competence ($p > .05$). Lastly, the baseline condition resulted in more anticipated satisfaction of the need for relatedness than the administrative purpose condition ($p < .05$); no other significant differences were found for relatedness. Descriptive statistics are presented in Table 9, and a comparison of the outcomes is presented in Figure 7. To summarize, there were significant differences in anticipated need satisfaction between at least two wearable device purposes for autonomy, but the needs for relatedness and competence were only significantly different between the baseline condition and one or more wearable purpose conditions. There were no significant differences in anticipated satisfaction of the needs for competence or relatedness between wearable purpose conditions. Therefore, Hypothesis 7a was supported, but Hypotheses 7b and 7c were not supported.

The mediating effects of wearable program awareness on organizational attractiveness through the anticipated satisfaction of the basic psychological needs for autonomy (i.e., Hypothesis 8a), competence (i.e., Hypothesis 8b), and relatedness (i.e., Hypothesis 8c) were tested using the method described in Montoya and Hayes (2017).

Although Montoya and Hayes do not provide a method for comparing more than two repeated-measures conditions, Judd et al. (2001) do outline a method of creating orthogonal contrast codes to collapse multiple conditions to two conditions for the purpose of comparing treatment vs. control effects. In the case of the present study, the contrast codes (1, 1, 1, -3) were applied to endogenous variables for the administrative, employee well-being, stress and scheduling, and baseline conditions, respectively. Effectively, these codes permit the comparison of one collapsed condition where participants are presented with awareness of an organization's wearable program prior to completing anticipated need satisfaction and applicant outcome measures, and another condition where participants are given no awareness prior to completing those measures. Following this prerequisite step, one can then proceed with the method outlined in Montoya and Hayes (2017). Montoya and Hayes extend the method of testing within-individual mediation effects outlined in Judd et al. (2001) by conceptualizing them in a path-analytic framework. Effects were estimated by building three models in Mplus v7; confidence intervals for the indirect effects are estimated using the percentile bootstrap method and 10,000 bootstrap samples. The indirect effects of wearable program awareness on organizational attractiveness through anticipated basic psychological need satisfaction was statistically significant for autonomy (B = -0.31, $p < .05$, 95% CI [-0.60, -0.11]), competence (B = -0.37, $p < .05$, 95% CI [-0.67, -0.15]), and relatedness (B = -0.27, $p < .05$, 95% CI [-0.47, -0.11]). Estimates of the direct, indirect, and total effects for each model can be found in Table 12. Therefore, Hypotheses 8a – 8c were supported.

The same method as described above was used to test the mediating effects of

wearable program awareness on job pursuit intentions through the anticipated satisfaction of the basic psychological needs for autonomy (i.e., Hypothesis 9a), competence (i.e., Hypothesis 9b), and relatedness (i.e., Hypothesis 9c). Mplus v7 was again used for model estimation. The indirect effects of wearable program awareness on job pursuit intentions through anticipated basic psychological need satisfaction was statistically significant for autonomy (B = -0.26, p < .05, 95% CI [-0.49, -0.09]), competence (B = -0.31, p < .05, 95% CI [-0.55, -0.11]), and relatedness (B = -0.21, p < .05, 95% CI [-0.37, -0.08]). Estimates of the direct, indirect, and total effects for each model can be found in Table 13. Therefore, Hypotheses 9a – 9c were supported.

The moderating effect of CFIP on the direct effect of wearable program awareness on organizational attractiveness (i.e., Hypothesis 10a) and job pursuit intentions (i.e., Hypothesis 10b) was tested in SPSS v24 using the method described in Montoya (2019). CFIP was regressed onto the predicted difference in organizational attractiveness and job pursuit intentions between the "wearable program awareness" and the "no wearable program awareness" conditions created by the contrast codes described previously. CFIP was not a significant predictor for organizational attraction (p > .05) or job pursuit intentions (p > .05); results are displayed in Table 14. Thus, Hypotheses 10a and 10b were not supported.

Lastly, the method outlined in Montoya (2018) was used to test the moderating effect of CFIP on the indirect effect of wearable program awareness on organizational attractiveness through autonomy (i.e., Hypothesis 11a), competence (i.e., Hypothesis 11b), and relatedness (i.e., Hypothesis 11c). This method was also used to test the same

effects for job pursuit intentions (i.e., Hypotheses 12a-12c). While preparing to test these models, one must first identify whether the basic moderating effect of a variable *W* (i.e., CFIP) on the mediating variable *M* (i.e., separate tests for autonomy, relatedness, competence) is statistically significant. Following this, one then identifies if the moderating effect of *W* on the outcome variable *Y* (i.e., separate tests for organizational attraction and job pursuit intentions) is statistically significant. Montoya (2018) describes that the resulting coefficients are then used to build a model in Mplus to test the overall effects of the moderated mediations. CFIP was regressed onto the predicted difference in autonomy, competence, and relatedness between the two conditions described previously. CFIP was not a significant predictor for the differences in autonomy ($p > .05$) competence ($p > .05$), or relatedness ($p > .05$); results are displayed in Table 15. As the moderating effects of CFIP on differences in organizational attraction and job pursuit intentions were tested previously and found to be nonsignificant (see Table 14), further testing of the full moderated mediation models is not warranted. It is clear that the data do not support the moderating effect of CFIP directly on prospective job applicants' reactions or indirectly through anticipated basic psychological need satisfaction. Therefore, Hypotheses 11a – 11c and 12a – 12c were not supported.

4.3. Study 2 Discussion

Generally, the results indicate that an organization that utilizes a wearable program for an administrative purpose (i.e., one which primarily benefits the organization) results in less organizational attraction (i.e., Hypothesis 6a) and less job

pursuit intentions (i.e., Hypothesis 6b) than a purpose which benefits employees. Further, if one judges the measures to be reliable, then the results also indicate that a similar relationship exists for prospective job applicants' anticipated satisfaction of the need for autonomy (i.e., Hypothesis 7a), but not for competence (i.e., Hypothesis 7b) or relatedness (i.e., Hypothesis 7c). Despite the aforementioned nonsignificant relationships for specific wearable program purposes, it does appear that general awareness of a wearable program does have an effect on organizational attractiveness (i.e., Hypotheses 8a-8c) and job pursuit intentions (i.e., Hypotheses 9a-9c) through prospective job applicants' anticipated satisfaction of basic psychological needs. However, contrary to Study 1, the data do not support a moderating effect of prospective job applicants' concern for information privacy (i.e., Hypotheses 10a-10b, 11a-11c, 12a-12c). A summary of the support for Study 2 hypotheses can be found in Table 16.

One limitation is the analytic approach used for the moderation, mediation, and moderated mediation analyses. The analytic approach initially proposed for Study 2 was SEM, and based on the guidelines provided by Kline (2016), the recruitment goal was set at 210 participants. Regrettably, due to an unusually high amount of low-quality data, the final sample size consisted of 128 participants, limiting the analytic approaches available. Montoya and Hayes (2017) and Montoya (2018, 2019) note that SEM would be preferable for within-person studies where more than two measurement instances exist, because the path-analytic approach is difficult to scale up beyond two measurement instances. They further note that SEM offers superior methods in dealing with missing data and measurement error, likely resulting in increased power.

Regrettably, these methods also require complicated models, and thus, larger sample sizes (Kline, 2016).

A second, but important limitation is the lackluster reliability of the measures, specifically in the case of the anticipated satisfaction of the need for autonomy. As an acceptable level of reliability is a necessary condition to interpret the resulting scores from a measure (Raykov & Marcoulides, 2011), the caution with which one should interpret the results of the analyses involving the autonomy variable cannot be overstated. While the "cut-off" for what might be defined as a reasonable level of reliability may vary, in general, researchers tend to apply a minimum of $\alpha = .70$ (Cortina et al., 2020), which exceeds the highest reliability reported for the autonomy measure. The reliabilities for each measure across each condition are presented in Table 9, and should be reviewed closely alongside the results reported earlier.

Despite these limitations, Study 2 does provide some support that anticipated satisfaction of different psychological needs might influence how prospective job applicants react to information about wearable programs in hiring organizations. The extant EPM literature acknowledges the importance of the need for autonomy (e.g., Stanton & Barnes-Farrell, 1996; Stanton & Stam, 2006), and in the present study, anticipated satisfaction of the need for autonomy was the only need that differed significantly across the three wearable purposes. However, when the baseline condition was considered, there was significantly more anticipated satisfaction of all three needs in that condition than in any of the wearable program purpose conditions. So, Study 2 does provide some evidence that it may still be useful to examine all three basic psychological

needs in the future, albeit with more psychometrically sound measures.

Lastly, similar to Study 1, an exploratory mixed purpose condition was included in the design to capture reactions to a program that lacks a clear primary beneficiary. Similar to Study 1, the means of each outcome for the stress and scheduling purpose were bounded by the administrative and employee well-being purposes (see Table 9). That being said, a statistically significant difference between these means was only observed for one outcome in the stress and scheduling purpose; there was significantly less anticipated satisfaction of the need for autonomy for the administrative purpose than for the employee well-being and the stress and scheduling purposes (see Figure 7).

In sum, Study 2 presents a novel investigation of the effects of the purpose of an organization's wearable program on common applicant reactions, and how information obtained during the job search process may influence those reactions. Generally, if a prospective job applicant encounters no information about organizational monitoring, they report more organizational attraction and job pursuit intentions. If information is present, then prospective job applicants report significantly less organizational attraction and job pursuit intentions for programs that do not benefit employees. This relationship is partially mediated by prospective job applicants' anticipated satisfaction of the needs for autonomy, competence, and relatedness. These results support the notion that satisfaction of all three needs should be considered (Cascio & Montealegre, 2016), and that to the degree it is publicly available, information about an organization's wearable program can influence prospective applicants' reactions.

5. GENERAL DISCUSSION

5.1. Summary

The present paper presents two investigations of prospective employee and applicant reactions to EPM by using multiple vignettes designed around real-world uses of EPM. Study 1 utilized MTurk to recruit a sample of working adults, who were presented with three vignettes in which participants were asked to imagine themselves as employees being monitored for different purposes, in different jobs. The measured reactions included turnover intentions, perceived invasion of privacy, and enthusiasm to participate. For each vignette, reaction measures were completed twice; first, participants were asked to imagine how they would react if the monitoring were mandatory, and then they were asked to imagine how they would react if the monitoring were voluntary. Generally, reactions were more favorable when the purpose benefitted employees in some way, and were less favorable when only the organization benefitted from the EPM.

Concern for information privacy was also examined as a moderating variable of the relationship between (1) wearable program purposes and simulated employees' reactions and (2) mandatory participation and simulated employees' reactions in Study 1. Participants' CFIP had a faciliatory effect on their reactions, such that participants who reported more CFIP also reported stronger reactions to different wearable program purposes and participatory discretion than participants who reported less CFIP. Concern for information privacy was also explored as a potential moderator in Study 2, which focused on prospective job applicants' reactions to EPM and did not explore the effects of individuals' discretion to participate in the EPM.

Study 2 expanded on Study 1 in a number of ways. First, there were several limitations in Study 1. The vignettes described a variety of device types (e.g., watches vs. badges), data being collected (e.g., some described physiological data being captured, others described voice recordings), and job types (i.e., each vignette asked participants to imagine themselves in different jobs). The presentation of the vignettes was not counterbalanced, so order effects could not be ruled out. Study 2 addressed these limitations by standardizing the data being captured, the device type, and the job; only the purpose of the wearable program was manipulated. Further, the presentation of the stimuli was more realistic; rather than requesting that participants imagine themselves in a particular job, participants were individuals who are very likely to be seeking the job being described in the near future, with professional knowledge of the field, and read about program purposes in a similar way in which they might find themselves in their own job searches. Wearables are not uncommon in the healthcare field. One such example of wearables being used in healthcare settings today are Vocera smart badges (Vocera, 2020), which facilitate communication between providers, and as a result, improve patients' quality of care and employee safety.

Additionally, Study 2 expanded the theoretical explanation for individuals' reactions to wearable programs by examining anticipated basic psychological needs satisfaction as a mediator, and sought to provide additional support for concern for information privacy as a moderating variable (though this relationship was not significant). Satisfaction of each of the three basic psychological needs was examined, rather than focusing on the need for autonomy alone. Further, Study 2 contributes to the

recruitment literature by investigating the degree to which organizational monitoring policies affect potential job applicants' attitudes, particularly job pursuit intentions and organizational attractiveness. Lastly, exploring this particular mode of electronic monitoring (i.e., wearables) provides a much-needed update to the current understanding of reactions to EPM. While the extant literature provides a solid foundation for understanding the consequences of electronic monitoring, it is possible that the new types of data that can be captured and the pervasiveness of wearable monitors may change how or why people develop certain attitudes toward monitoring programs used in practice today.

The results of Study 2 also have implications for applied practice. To the degree that EPM affects applicant reactions, it would behoove organizations to carefully consider not only their current employees' reactions to a monitoring program, but how members of the general public might view the program. Keeping in mind that the general use of EPM is associated with higher collective turnover intentions (Heavey et al., 2013), an organization cannot afford to have its talent pipeline disrupted. The results of Study 2 would suggest that prospective job applicants' reactions to EPM are similar to simulated employees' reactions (e.g., more negative reactions when the EPM does not benefit employees). Therefore, this provides an added incentive for organizations to avoid monitoring for the sake of itself, and focus on ensuring that monitoring serves to benefit both employees and the organization.

5.2. Future Directions

The present research can be expanded in several ways. First, with respect to

applicant reactions, one might explore how applicants react to being presented with information about an organization's use of EPM at different stages within the recruitment and selection process. For example, what if an applicant reads about physiological data being collected as part of a wellness program in a benefits brochure, after a job offer has been given? Perhaps a manager might mention that all employees are required to download an app on their personal mobile devices during an interview. As applicants continue deeper into the application process and the prospect of receiving a job offer increases, their "privacy calculus" (Bhave et al., 2020) likely changes not just with respect to the information they are providing as part of that process, but presumably for the job to which they are applying.

Additionally, information about EPM was presented as part of a press release published in a fictional news outlet in Study 2. This is just one of many sources in which applicants could read about the use of EPM in an organization during their job search (Breaugh, 2013). Applicants could read about it as part of an opinion piece or investigative report (e.g., Harwell, 2019; Rowland, 2019), as part of a review on a website like Glassdoor, or via word-of-mouth. Therefore, a future investigation might explore the influence of the source of information about an organization's monitoring program (e.g., employee v. manager/HR) and the valence of that information (e.g., positive vs. negative) on the sign and magnitude of applicant reactions.

With regard to employee reactions, the extant literature would benefit from continued interdisciplinary collaboration. In an overview of opportunities for collaboration between organizational and cybersecurity researchers, Dalal et al. (2022)

highlight several benefits that collaboration may bring; as a result, the *Journal of Business and Psychology* is organizing a special issue dedicated to this topic. The field of cybersecurity may present specific, high-impact behaviors that employees may engage in to undermine EPM. For example, an employee may discover a way to evade web traffic monitoring on their work computer, which they then use to browse social media during their lunch break. While the employee, or even the employee's manager, may see this as a small offense that does not impact their work, the existence of such an exploit could present an avenue that an adversary might take advantage of to inflict serious harm on the organization. The same tools a manager uses to monitor employees' performance (i.e., EPM) have the potential to be used by cybersecurity professionals to monitor and evaluate threats to the organization, and as such, should be implemented in such a way that employees do not seek to undermine them (Tomczak et al., 2018).

Lastly, the study management-level antecedents to the use of EPM remains an area rich for future research. Even armed with the knowledge that employees and applicants may react negatively to the use of EPM for a particular purpose, organizations may still choose to implement it because the benefits of implementation outweigh the costs (Chen & Ross, 2005). For example, Ovia maintains that their pregnancy-tracking application helps improve the lives of women who use the application and their children, in addition to financially benefitting organizations (Harwell, 2019). The degree to which organizational leaders feel that it is incumbent on them to provide tools to improve their employees' health and wellness may play an important role in their decision to implement physiological monitoring (West & Bowman, 2016), despite these data being

highly sensitive (Bhave et al., 2020). The question of how applicant reactions factor into organizations' decisions on whether and how to implement EPM merits further study.

5.3. Conclusions

As computing and sensing technologies continue to improve, the opportunities to monitor employees in novel ways will continue to grow. The present paper presents investigations of prospective job applicants' and simulated employees' reactions to EPM on different wearable platforms, which are capable of capturing data from employees for a variety of purposes that other platforms (e.g., computer, laptop, mobile phones) cannot. Concern for information privacy played an important role in facilitating simulated employees' reactions to organizationally imposed wearable device programs; therefore, organizations would be well-served to consider employees' information privacy interests to attenuate the effects of those concerns. Tomczak et al. (2018) provide best practice recommendations for implementing EPM, many of which are centered around employees' concerns about the quantity and purpose for which information is being collected.

It would seem that if employee reactions are being carefully considered when implementing EPM, the positive effects should similarly carry over to applicant reactions. Study 2 showed that EPM that solely benefitted the organization was perceived less favorably (i.e., lower organizational attractiveness and job pursuit intentions) than EPM that benefitted employees in some way. When applicants read news stories (e.g., Harwell, 2019; Rowland, 2019), they are effectively catching a glimpse of what their work life will be like, and reacting similarly to how they might

react if they were actually in the organization themselves. These reactions may be mediated by the degree to which they anticipate that their basic psychological needs will be satisfied in the jobs they are reading about. At the very least, the extant literature (e.g., Stanton & Barnes-Farrell, 1996; Stanton & Stam, 2006) supports that the need for autonomy is an important determinant of how employees will react to EPM.

In conclusion, if organizations are considering how employees (and applicants) react to EPM, they should find some way to ensure that employees are not surrendering information and receiving nothing in return. Put another way, the "privacy calculus" (Bhave et al., 2020) that organizations and employees regularly engage in should not be heavily favored towards the organization; there should be a compromise, with the organization only taking what information is absolutely needed, and with employees receiving some benefit (e.g., developmental feedback) for surrendering that information. Especially with the legal landscape around workplace monitoring and personal privacy shifting around the world (Sprague, 2018), organizations should thoughtfully contemplate how and why they use EPM, and how it affects their employees.

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APPENDIX A

TABLES

Table 1

Differences in Employee Reactions to Three Wearable Device Programs

Source	Outcome	SS	df	MS	F	partial η^2
Vignette	Enthusiasm to participate	228.11	1.85	123.46	141.71**	0.34
	Turnover intentions	121.14	1.80	67.25	78.41**	0.22
	Invasion of privacy	149.77	1.91	78.51	85.99**	0.24
Error	Enthusiasm to participate	441.06	506.24	0.87		
	Turnover intentions	423.36	493.56	0.86		
	Invasion of privacy	477.23	522.72	0.91		

Note. Mauchly's Test of Sphericity indicated that the assumption of sphericity had been violated for enthusiasm to participate, $\chi^2(2) = 25.58$, $p < .01$, turnover intentions, $\chi^2(2) = 34.01$, $p < .01$, and invasion of privacy, $\chi^2(2) = 15.58$, $p < .01$. Degrees of freedom were corrected using Huynh-Feldt estimates of sphericity ($\varepsilon = 0.92, 0.90, \& 0.95$).

**$p < .01$

Table 2

The Influence of Discretion to Participate and Wearable Program Purpose on Employee Reactions

		Enthusiasm to participate				Turnover intentions				Invasion of privacy			
Purpose		M	SD	*t*	*d*	M	SD	*t*	*d*	M	SD	*t*	*d*
Stress and scheduling	Voluntary	3.45	1.13	-	-	2.49	1.26	-	-	3.15	1.17	-	-
	Required	3.02	1.25	6.90**	0.37	2.94	1.29	6.28**	0.35	3.47	1.19	4.78**	0.28
Team effectiveness	Voluntary	2.54	1.23	-	-	3.17	1.21	-	-	3.83	1.04	-	-
	Required	2.35	1.29	3.89**	0.16	3.61	1.2	6.67**	0.36	3.95	1.04	2.38**	0.12
Employee well-being	Voluntary	3.80	1.04	-	-	2.34	1.24	-	-	2.79	1.2	-	-
	Required	3.61	1.08	3.74**	0.18	2.64	1.32	4.66**	0.24	2.91	1.22	2.21**	0.10

Note. Participants responded with how much they agree or disagree with statements capturing the listed outcomes. Responses ranged from 1 (strongly disagree) to 5 (strongly agree). Voluntary = participants asked to respond as if participation in the hypothesized program was voluntary. Required = participants asked to respond as if participation in the hypothetical program was mandatory.

**$p < .01$, one-tailed.

Table 3

The Influence of Concern for Information Privacy on Employee Reactions

	Enthusiasm to participate					Turnover intentions					Invasion of privacy				
Variable	*B*	*SE B*	β	*F*	R^2	*B*	*SE B*	β	*F*	R^2	*B*	*SE B*	β	*F*	R^2
Intercept	3.60	0.27	--	--	--	3.14	0.30	--	--	--	2.50	0.24	--	--	--
CFIP	-0.12	0.07	-0.11	3.06	0.01	-0.07	0.08	-0.06	0.88	0.00	0.22	0.06	0.22	13.30**	0.05

Note. Degrees of freedom for each *F* test were (1, 273). CFIP = Concern for Information Privacy.

**$p < .01$

Table 4

The Moderating Effect of Concern for Privacy on Device Purpose for Three Outcomes

		Enthusiasm to participate				Turnover intentions				Invasion of privacy			
Predictor	Level of CFIP	*B*	*SE B*	*t*	t_{ss}	*B*	*SE B*	*t*	t_{ss}	*B*	*SE B*	*t*	t_{ss}
Intercept	Low CFIP	2.78	0.08	34.20**	--	3.21	0.09	36.29**	--	3.55	0.08	46.78**	--
	Mean CFIP	2.44	0.06	42.41**	--	3.39	0.06	54.23**	--	3.89	0.05	72.45**	--
	High CFIP	2.10	0.08	25.77**	--	3.57	0.09	40.39**	--	4.23	0.08	55.66**	--
Stress and scheduling	Low CFIP	0.52	0.08	6.53**	--	-0.44	0.09	-5.20**	--	-0.40	0.08	-4.81**	--
	Mean CFIP	0.80	0.06	14.15**	--	-0.68	0.06	-11.20**	--	-0.57	0.06	-9.71**	--
	High CFIP	1.08	0.08	13.48**	--	-0.91	0.09	-10.63**	--	-0.75	0.08	-8.92**	--
Employee well-being	Low CFIP	0.77	0.08	9.68**	--	-0.44	0.09	-5.19**	--	-0.66	0.08	-7.83**	--
	Mean CFIP	1.27	0.06	22.60**	--	-0.90	0.06	-14.93**	--	-1.04	0.06	-17.60**	--
	High CFIP	1.78	0.08	22.28**	--	-1.36	0.09	-15.91**	--	-1.43	0.08	-17.06**	--
CFIP	Mean CFIP	-0.49	0.08	-5.96**	--	0.26	0.90	2.90**	--	0.49	0.08	6.28**	--
CFIP x Stress and scheduling	Mean CFIP	0.40	0.08	4.91**	-1.14	-0.33	0.09	-3.84**	-0.81	-0.25	0.09	-2.90**	3.08**
CFIP x Employee well-being	Mean CFIP	0.73	0.08	8.91**	2.78**	-0.66	0.09	-7.58**	-4.42**	-0.56	0.09	-6.53**	-0.92

Note. CFIP = Concern for Information Privacy. Low CFIP = -1SD CFIP, High CFIP = +1SD CFIP. Reference group = Required participation. t_{ss} = *t*-value for test that slope is significantly different than 0.

**$p < .01$

Table 5

Goodness of Fit Comparisons for Two Models of Device Purpose Predicting Three Outcomes

	Enthusiasm to participate			Turnover intentions			Invasion of privacy		
Model	df	Log-likelihood	χ^2	df	Log-likelihood	χ^2	df	Log-likelihood	χ^2
Model 1	5	-2472.61	--	5	-2580.62	--	5	-2489.57	--
Model 2	8	-2437.36	70.50**	8	-2556.85	47.53**	8	-2467.06	45.01**

Note. Model 1 contains only the simple effect of device purpose. Model 2 adds the interaction term of concern for information privacy on device purpose.

**$p < .01$

Table 6

The Moderating Effect of Concern for Privacy on Discretion to Participate for Three Outcomes

		Enthusiasm to participate				Turnover intentions				Invasion of privacy			
Predictor	Level of CFIP	*B*	*SE B*	*t*	t_{ss}	*B*	*SE B*	*t*	t_{ss}	*B*	*SE B*	*t*	t_{ss}
	Low CFIP	3.14	0.08	40.63**	--	3.00	0.08	36.37**	--	3.25	0.07	46.44**	--
Intercept	Mean CFIP	2.99	0.05	54.69**	--	3.07	0.06	52.59**	--	3.45	0.05	69.77**	--
	High CFIP	2.84	0.08	36.71**	--	3.13	0.08	37.98**	--	3.65	0.07	52.21**	--
	Low CFIP	0.14	0.08	1.82	--	-0.17	0.07	-2.23*	--	-0.09	0.08	-1.17	--
Voluntary	Mean CFIP	0.28	0.05	5.09**	--	-0.40	0.05	-7.51**	--	-0.19	0.05	-3.53**	--
	High CFIP	0.41	0.08	5.38**	--	-0.63	0.07	-8.38**	--	-0.29	0.08	-3.83**	--
CFIP	Mean CFIP	-0.22	0.08	-2.77**	--	0.10	0.08	1.14	--	0.29	0.07	4.08**	--
CFIP x Voluntary	Mean CFIP	0.20	0.08	2.51*	-0.26	-0.33	0.08	-4.35**	-2.81**	-0.15	0.08	-1.88	2.03**

Note. CFIP = Concern for Information Privacy. Low CFIP = -1SD CFIP, High CFIP = +1SD CFIP. Reference group = Required participation. t_{ss} = *t*-value for test that slope is significantly different than 0.

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

Table 7

Goodness of Fit Comparisons for Two Models of Discretion to Participate Predicting Three Outcomes

	Enthusiasm to participate			Turnover intentions			Invasion of privacy		
Model	df	Log-likelihood	χ^2	df	Log-likelihood	χ^2	df	Log-likelihood	χ^2
Model 1	4	-2669.01	--	4	-2658.82	--	4	-2618.10	--
Model 2	6	-2667.72	2.58	6	-2652.32	13.00**	6	-2613.35	9.50**

Note. Model 1 contains only the simple effect of discretion to participate. Model 2 adds the interaction term of concern for information privacy on discretion to participate.

**$p < .01$

Table 8
Summary of Support for Study 1 Hypotheses

Hypothesis	Supported	Not Supported
Hypothesis 1: A wearable program that collects data from employees primarily to benefit the organization will be associated with (a) less enthusiasm to participate in the program, (b) stronger perceptions of invasion of privacy, and (c) higher levels of intent to quit than a program that collects data primarily to benefit employees.	a, b, c	
Hypothesis 2: A mandatory wearable program will be associated with (a) less enthusiasm to participate in the program, (b) stronger perceptions of invasions of privacy, and (c) higher levels of intent to quit compared to a voluntary program.	a, b, c	
Hypothesis 3: There will be a negative relationship between concern for information privacy and (a) enthusiasm to participate in the wearable program, and a positive relationship between concern for information privacy and (b) perceptions of invasions of privacy and (c) level of intent to quit.	b	a, c
Hypothesis 4: Concern for information privacy will moderate the relationship between the wearable program purpose and (a) enthusiasm to participate in the program, (b) perceptions of invasion of privacy, and (c) intent to quit, such that individuals who report more concern for information privacy will report stronger associations than individuals who report less concern for information privacy.	a, b, c	
Hypothesis 5: Concern for information privacy will moderate the relationship between the discretion to participate in the wearable program and (a) enthusiasm to participate in the program, (b) perceptions of invasion of privacy, and (c) intent to quit, such that individuals who report more concern for information privacy will report stronger associations than individuals who report less concern for information privacy.	b, c	a

Table 9

Descriptive Statistics, Correlations, and Reliabilities for Study 2 Variables

			Job Description					Administrative Purpose				
Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10
1. Attractiveness	4.33	0.55	**.68**									
2. Intentions	4.31	0.55	.73**	**.76**								
3. Autonomy	3.31	0.66	-.07	.22*	**.14**							
4. Competence	4.46	0.53	.41**	.50**	.12	**.66**						
5. Relatedness	3.99	0.70	.24**	.34**	.30**	.37**	**.59**					
6. Attractiveness	3.63	1.10	.34**	.51**	.11	.34**	.28**	**.90**				
7. Intentions	3.71	1.08	.33**	.52**	.17	.38**	.28**	.95**	**.93**			
8. Autonomy	2.93	0.92	.01	.31**	.65**	.19*	.37**	.59**	.61**	**.51**		
9. Competence	4.07	0.80	.31**	.44**	.19*	.45**	.29**	.78**	.77**	.57**	**.80**	
10. Relatedness	3.72	0.91	.15	.36**	.34**	.22*	.65**	.53**	.51**	.52**	.46**	**.73**
11. Attractiveness	3.90	0.88	.38**	.58**	.12	.27**	.14	.53**	.49**	.27**	.44**	.34**
12. Intentions	3.99	0.89	.35**	.64**	.23**	.32**	.19*	.58**	.58**	.36**	.47**	.38**
13. Autonomy	3.20	0.77	-.11	.25**	.74**	.07	.23**	.24**	.26**	.70**	.25**	.39**
14. Competence	4.23	0.76	.34**	.50**	.20*	.42**	.21*	.42**	.41**	.24**	.51**	.29**
15. Relatedness	3.83	0.83	.24**	.43**	.35**	.20*	.59**	.35**	.35**	.39**	.34**	.65**
16. Attractiveness	3.98	0.92	.33**	.43**	-.01	.27**	.24**	.45**	.43**	.13	.25**	.39**
17. Intentions	4.06	0.87	.29**	.51**	.08	.26**	.26**	.49**	.49**	.24**	.29**	.44**
18. Autonomy	3.29	0.74	-.13	.16	.62**	.10	.25**	.23**	.25**	.62**	.17	.35**
19. Competence	4.26	0.72	.33**	.44**	.11	.45**	.23*	.39**	.38**	.22*	.45**	.28**
20. Relatedness	3.88	0.85	.23**	.39**	.32**	.22*	.58**	.37**	.32**	.42**	.33**	.65**
21. CFIP	4.31	0.46	.39**	.42**	.10	.45**	.20*	.27**	.32**	.12	.32**	.06

Note. Bolded values in the diagonal are measure reliability (α). Attractiveness = Organizational Attractiveness, Intentions = Job Pursuit Intentions. CFIP = Concern for Information Privacy.

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

Table 9 (continued)

Descriptive Statistics, Correlations, and Reliabilities for Study 2 Variables

	Employee Well-being					Stress and Scheduling					
Variable	11	12	13	14	15	16	17	18	19	20	21
1. Attractiveness											
2. Intentions											
3. Autonomy											
4. Competence											
5. Relatedness											
6. Attractiveness											
7. Intentions											
8. Autonomy											
9. Competence											
10. Relatedness											
11. Attractiveness	**.85**										
12. Intentions	.91**	**.91**									
13. Autonomy	.36**	.45**	**.29**								
14. Competence	.65**	.66**	.30**	**.86**							
15. Relatedness	.56**	.60**	.44**	.57**	**.72**						
16. Attractiveness	.60**	.63**	.16	.49**	.46**	**.85**					
17. Intentions	.60**	.70**	.26**	.50**	.51**	.92**	**.91**				
18. Autonomy	.16	.29**	.74**	.15	.30**	.33**	.40**	**.13**			
19. Competence	.48**	.55**	.22*	.74**	.49**	.65**	.66**	.27**	**.82**		
20. Relatedness	.44**	.48**	.41**	.46**	.74**	.54**	.60**	.43**	.51**	**.76**	
21. CFIP	.22*	.22*	.08	.26**	.08	.18*	.20*	.05	.25**	.10	**.78**

Note. Bolded values in the diagonal are measure reliability (α). Attractiveness = Organizational Attractiveness, Intentions = Job Pursuit Intentions. CFIP = Concern for Information Privacy.

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

Table 10

Differences in Applicant Reactions Across Four Conditions

Source	Outcome	SS	df	MS	F	partial η^2
Condition	Organizational Attractiveness	32.14	2.83	11.38	23.74**	0.16
	Job Pursuit Intentions	23.50	2.59	9.08	22.27**	0.15
Error	Organizational Attractiveness	171.91	358.78	0.48		
	Job Pursuit Intentions	133.99	328.70	0.41		

Note. Mauchly's Test of Sphericity indicated that the assumption of sphericity had been violated for organizational attractiveness, $\chi^2(5) = 16.15$, $p < .01$ and job pursuit intentions, $\chi^2(5) = 32.62$, $p < .01$. Degrees of freedom were corrected using Huynh-Feldt estimates of sphericity ($\varepsilon = 0.94$ & 0.86).

**$p < .01$

Table 11

Differences in Anticipated Basic Psychological Need Satisfaction Across Four Conditions

Source	Outcome	SS	df	MS	F	partial η^2
Condition	Autonomy	11.24	2.76	4.08	18.35**	0.13
	Competence	9.92	2.69	3.69	13.11**	0.09
	Relatedness	4.96	3	1.69	6.79**	0.05
Error	Autonomy	77.81	350.21	0.22		
	Competence	96.09	341.60	0.28		
	Relatedness	92.79	381	0.24		

Note. Mauchly's Test of Sphericity indicated that the assumption of sphericity had been violated for autonomy, $\chi^2(5) = 21.83$, $p < .01$ and competence, $\chi^2(5) = 30.02$, $p < .01$. Degrees of freedom were corrected using Huynh-Feldt estimates of sphericity ($\varepsilon = 0.92$ & 0.90).

**$p < .01$

Table 12

Models of the Mediating Effect for Organizational Attractiveness

	Autonomy		Competence		Relatedness	
Effect / Path	*B*	*SE B*	*B*	*SE B*	*B*	*SE B*
X -> M (a)	-0.51**	0.12	-0.83**	0.14	-0.54**	0.15
M -> Y (b)	0.62**	0.14	0.44**	0.13	0.50**	0.09
Indirect (ab)	-0.31*	0.12	-0.37**	0.13	-0.27**	0.09
Direct (c')	-1.17**	0.19	-1.12**	0.20	-1.21**	0.18
Total (c)	-1.48**	0.18	-1.49**	0.18	-1.48**	0.18

Note. X -> M (a) is the path estimate for the wearable awareness conditions to anticipated need satisfaction and M -> Y (b) is the path estimate for anticipated need satisfaction to organizational attractiveness.

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

Table 13

Models of the Mediating Effect for Job Pursuit Intentions

	Autonomy		Competence		Relatedness	
Effect / Path	*B*	*SE B*	*B*	*SE B*	*B*	*SE B*
X -> M (a)	-0.51**	0.12	-0.83**	0.14	-0.54**	0.15
M -> Y (b)	0.52**	0.12	0.37**	0.11	0.39**	0.08
Indirect (ab)	-0.26*	0.10	-0.31**	0.11	-0.21**	0.08
Direct (c')	-0.91**	0.16	-0.87**	0.18	-0.96**	0.14
Total (c)	-1.17**	0.15	-1.17**	0.15	-1.17**	0.15

Note. X -> M (a) is the path estimate for the wearable awareness conditions to anticipated need satisfaction and M -> Y (b) is the path estimate for anticipated need satisfaction to job pursuit intentions.

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

Table 14

The Moderating Effect of Concern for Information Privacy on Applicant Reactions

	Organizational Attraction					Job Pursuit Intentions				
Variable	*B*	*SE B*	β	*F*	R^2	*B*	*SE B*	β	*F*	R^2
Intercept	-1.49	0.20	--	--	--	-1.17	0.16	--	--	--
CFIP	0.02	0.20	0.01	0.10	0.00	0.02	0.16	0.01	0.01	0.00

Note. Degrees of freedom for each *F* test were (1, 126). CFIP = Concern for Information Privacy.

Table 15

The Moderating Effect of Concern for Information Privacy on Anticipated Basic Psychological Need Satisfaction

	Autonomy					Competence					Relatedness				
Variable	*B*	*SE B*	β	*F*	R^2	*B*	*SE B*	β	*F*	R^2	*B*	*SE B*	β	*F*	R^2
Intercept	-0.51	0.13	--	--	--	-0.83	0.15	--	--	--	-0.54	0.15	--	--	--
CFIP	0.00	0.13	0.00	0.00	0.00	-0.08	0.15	-0.04	0.24	0.00	-0.23	0.16	-0.13	2.15	0.02

Note. Degrees of freedom for each *F* test were (1, 126). CFIP = Concern for Information Privacy.

Table 16

Summary of Support for Study 2 Hypotheses

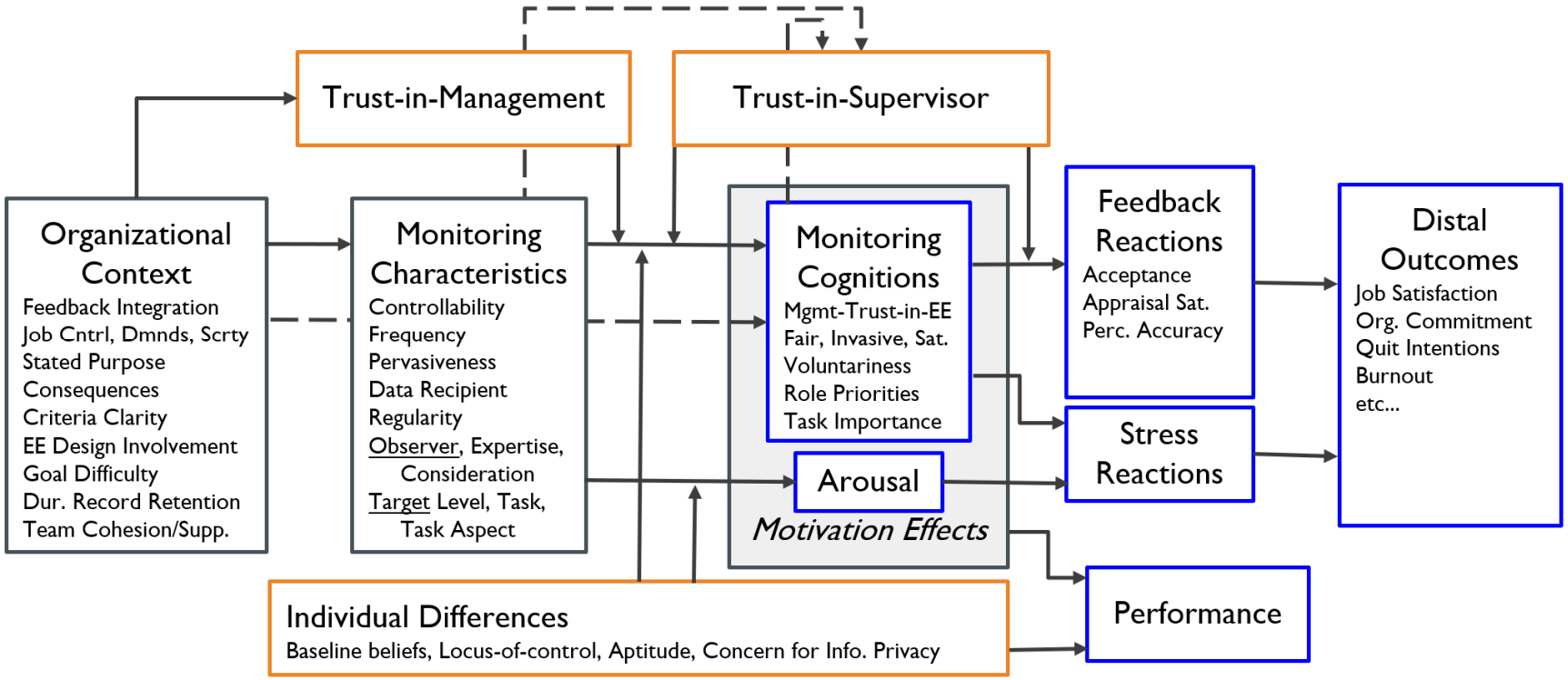
Hypothesis	Supported	Not Supported
Hypothesis 6: A wearable program that collects data from employees primarily to benefit the organization will be associated with (a) less organizational attraction and (b) weaker job pursuit intentions than a program that collects data primarily to benefit employees.	a, b	
Hypothesis 7: Anticipated satisfaction of the basic needs for (a) autonomy, (b) relatedness, and (c) competence will vary between different wearable program purposes.	a	b, c
Hypothesis 8: Anticipated satisfaction of the needs for (a) autonomy, (b) relatedness, and (c) competence will partially mediate the relationship between applicants' awareness of an organization's wearable program and organizational attraction, such that awareness about an organization's wearable program will attenuate need satisfaction, thereby attenuating organizational attraction.	a, b, c	
Hypothesis 9: Anticipated satisfaction of the needs for (a) autonomy, (b) relatedness, and (c) competence will partially mediate the relationship between applicants' awareness of an organization's wearable program and job pursuit intentions, such that awareness about an organization's wearable program will attenuate need satisfaction, thereby attenuating job pursuit intentions.	a, b, c	
Hypothesis 10: Concern for information privacy will moderate the direct effect of awareness of an organization's wearable program on applicant reaction outcomes such that higher levels of concern for information privacy will facilitate the effects of awareness of an organization's wearable program on (a) organizational attraction and (b) job pursuit intentions.		a, b
Hypothesis 11: Concern for information privacy will moderate the indirect effects of awareness of an organization's wearable program on organizational attraction through anticipated satisfaction of the needs for (a) autonomy, (b) relatedness, and (c) competence, such that higher levels of concern for information privacy will facilitate the indirect effects of awareness of an organization's wearable program on organizational attraction.		a, b, c
Hypothesis 12: Concern for information privacy will moderate the indirect effects of awareness of an organization's wearable program on job pursuit intentions through anticipated satisfaction of the needs for (a) autonomy, (b) relatedness, and (c) competence such that higher levels of concern for information privacy will facilitate the indirect effects of awareness of an organization's wearable program on job pursuit intentions.		a, b, c

APPENDIX B

FIGURES

Figure 1

Stanton's (2000a) Framework of Employee Reactions to Being Monitored



Note. Cntrl = control, Dmnds = job demands, Scrty = security, EE = employee, Dur = duration, Supp = support, Mgmt = management, Sat = satisfaction, Perc = perceived, Org = organizational.

Figure 2
Summary of the Hypothesized Effects for Study 1

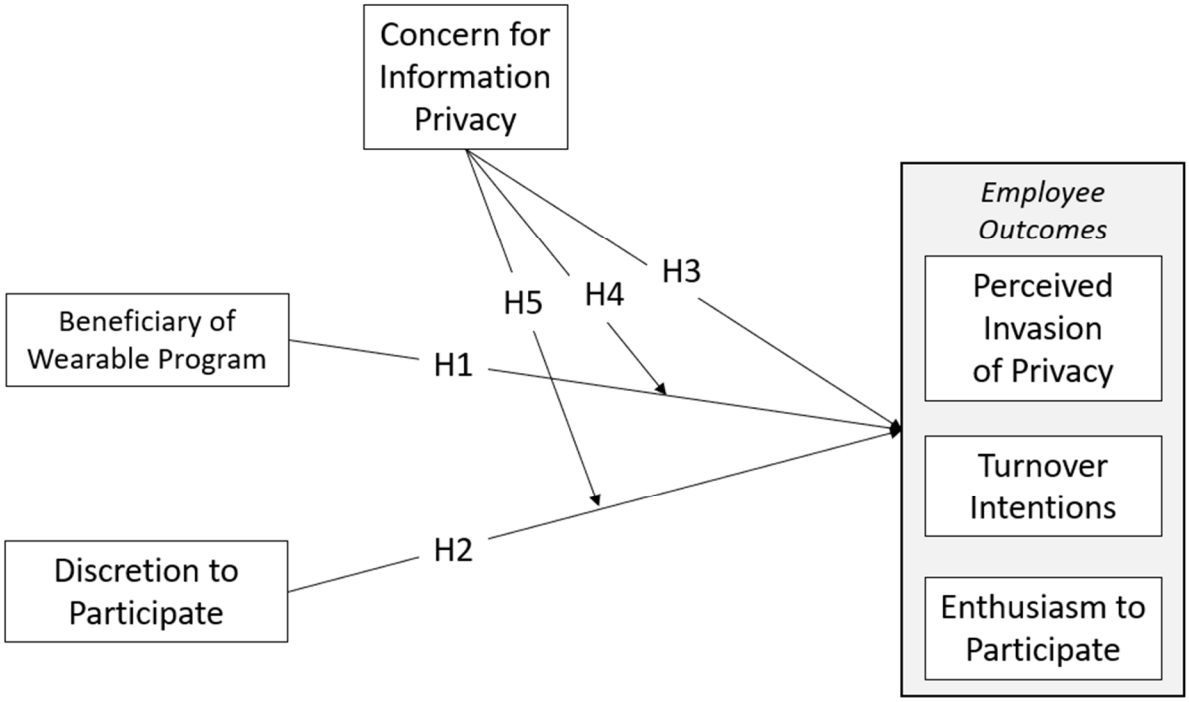
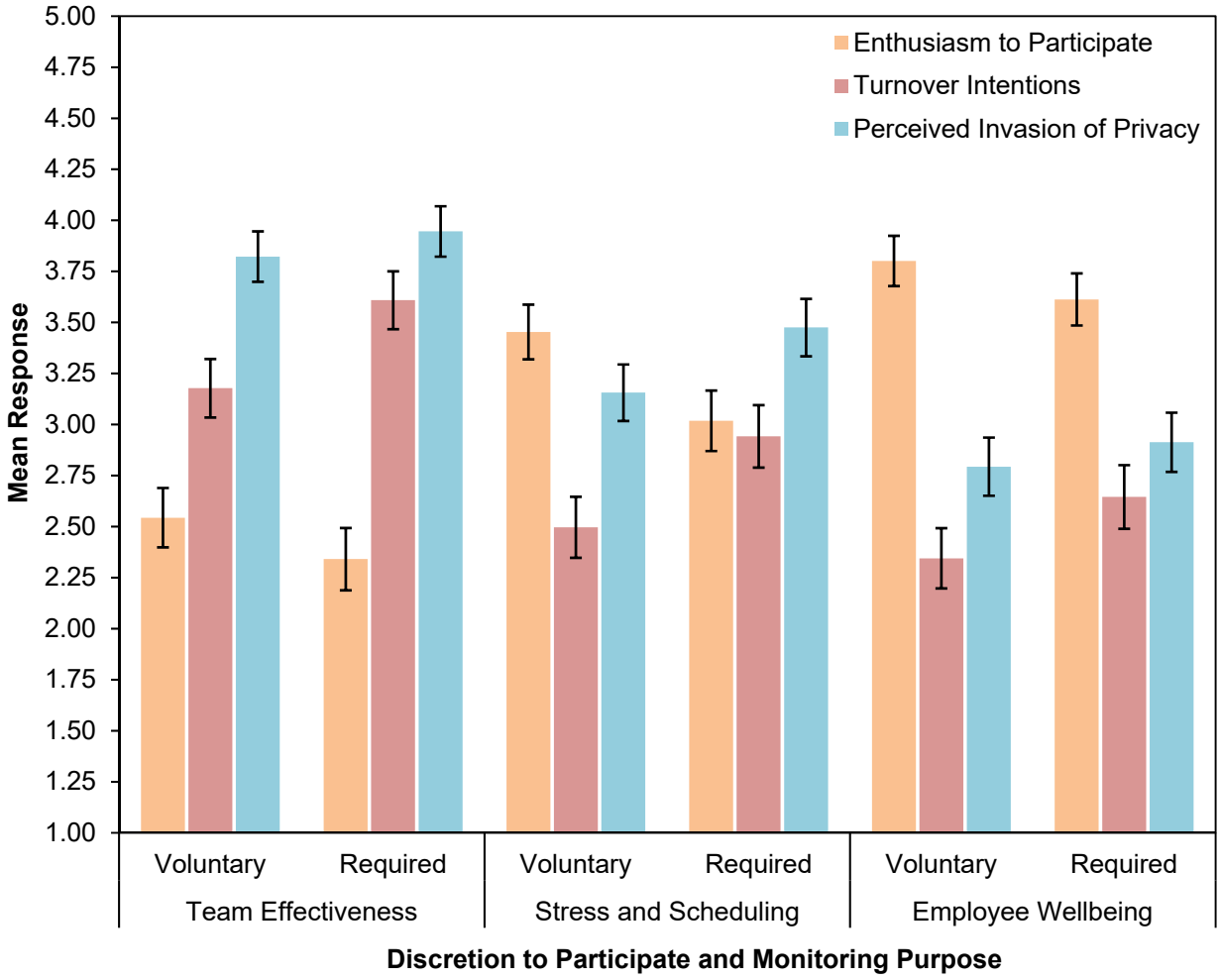


Figure 3

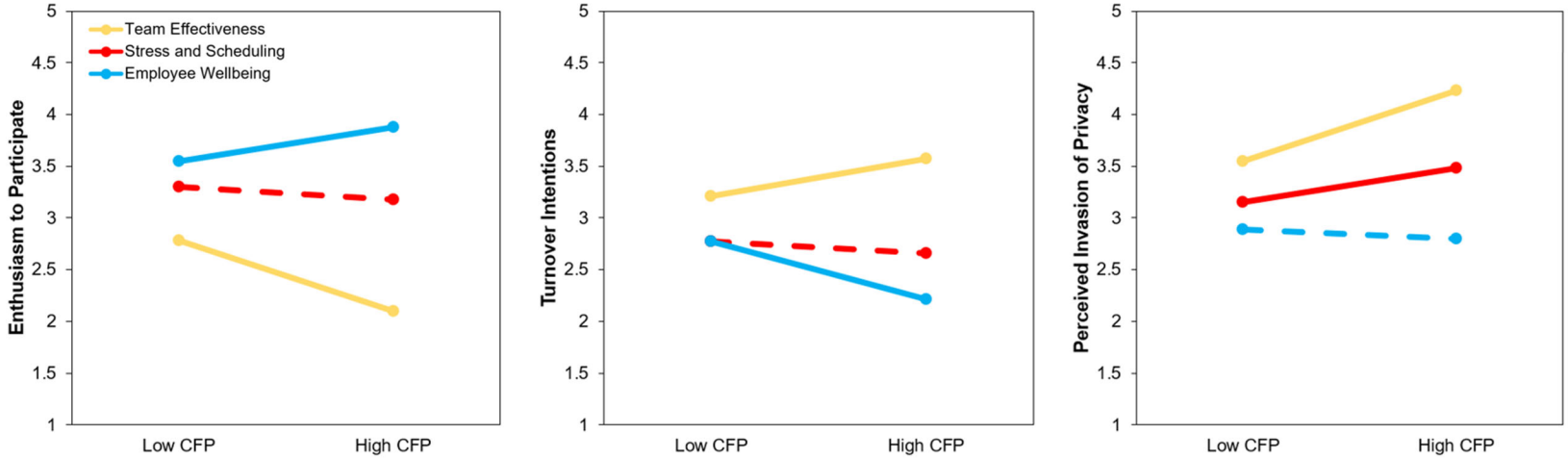
Mean Responses to Employee Reaction Variables



Note. Responses ranged from 1 (strongly disagree) to 5 (strongly agree). Voluntary = participants asked to respond as if participation in the hypothesized program was voluntary. Required = participants asked to respond as if participation in the hypothetical program was mandatory. Error bars represent 95% confidence intervals.

Figure 4

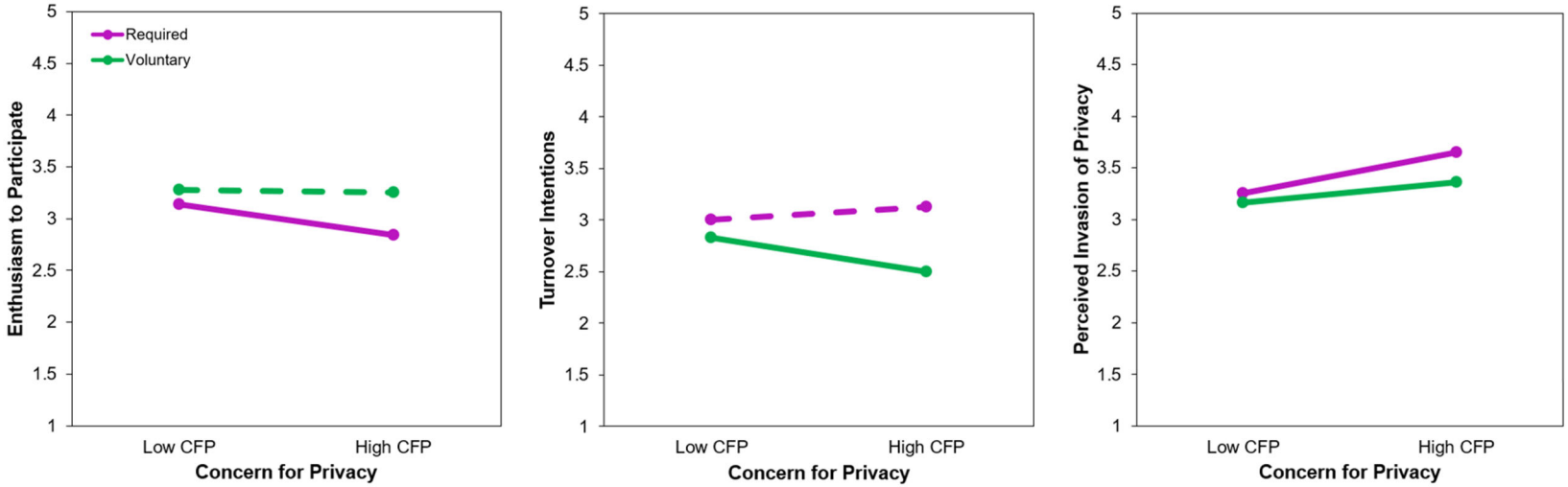
Simple Slopes of Outcomes of Interest by Concern for Information Privacy (CFIP) for Each Wearable Purpose



Note. Responses ranged from 1 (strongly disagree) to 5 (strongly agree). Low CFIP = -1SD, High CFIP = +1SD.

Figure 5

Simple Slopes of Outcomes of Interest by Concern for Information Privacy (CFIP) for Participatory Discretion



Note. Responses ranged from 1 (strongly disagree) to 5 (strongly agree). Low CFIP = -1SD, High CFIP = +1SD.

Figure 6
Summary of the Hypothesized Effects for Study 2

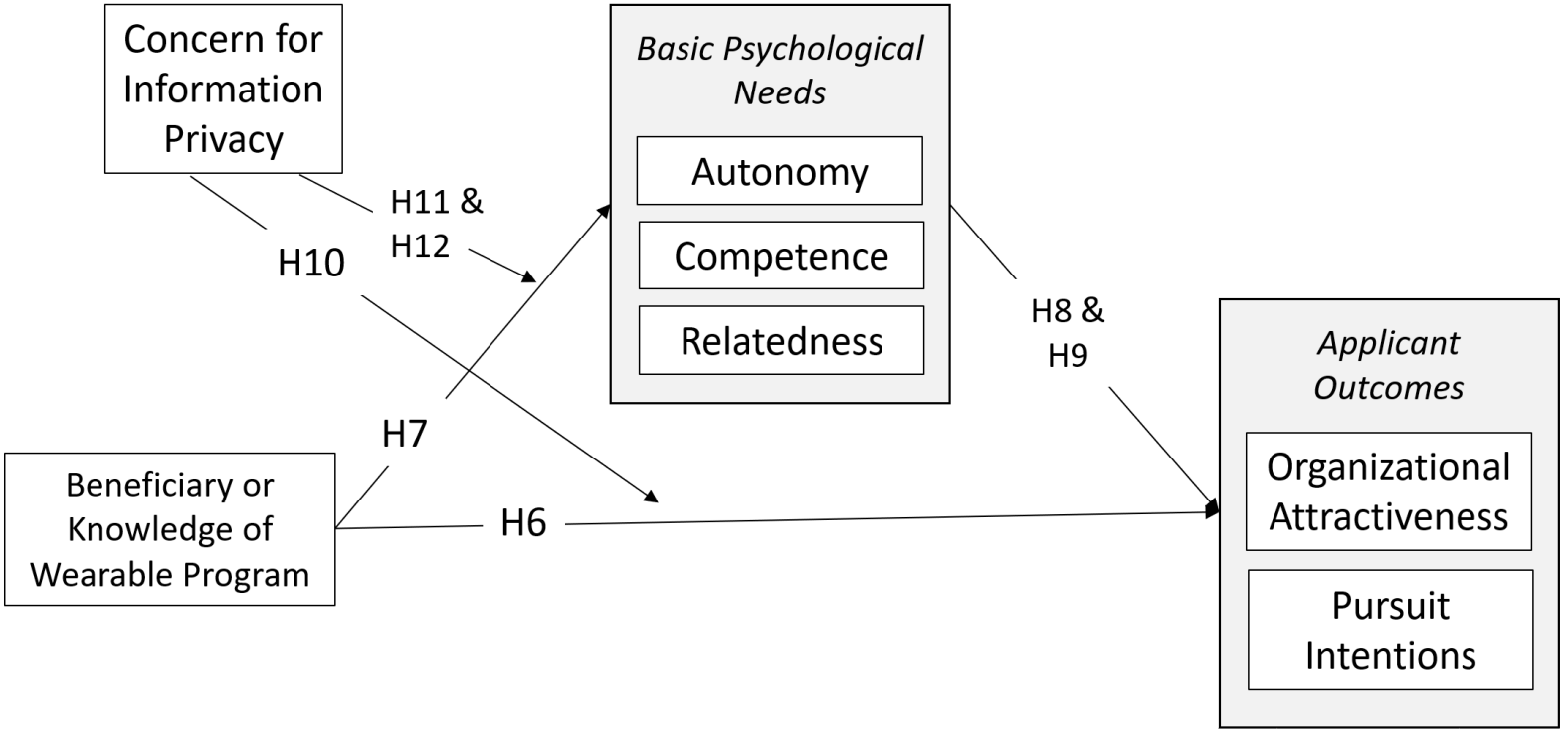
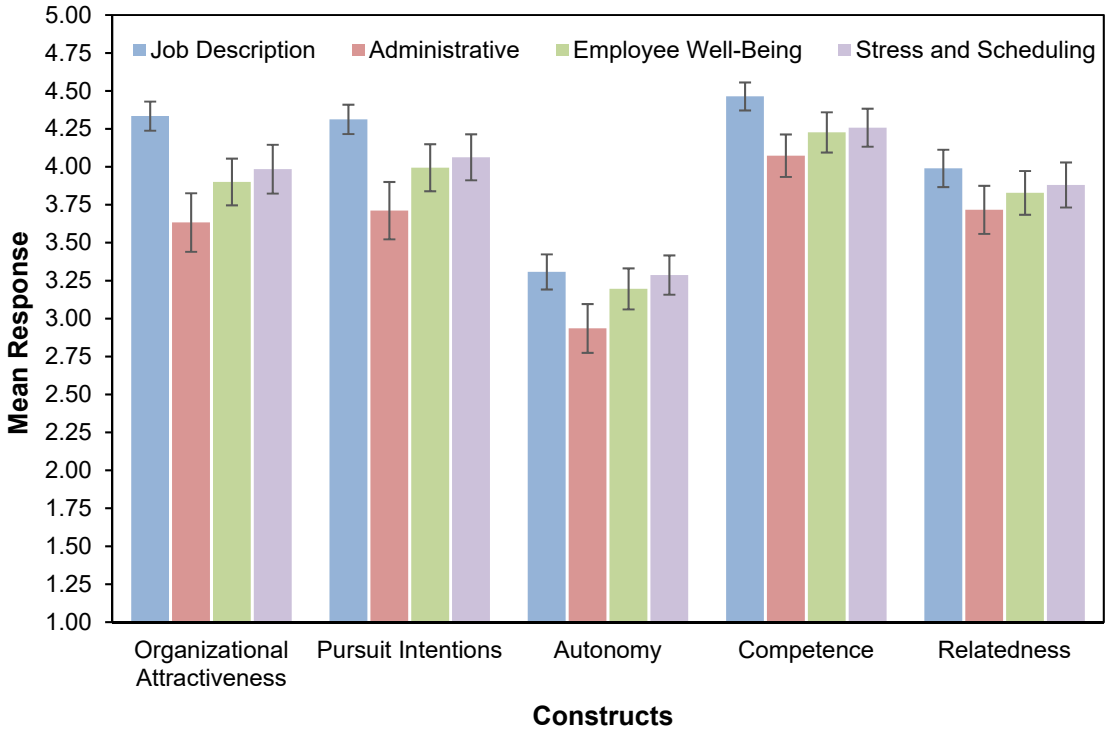


Figure 7

Mean Responses to Applicant Reactions and Anticipated Basic Psychological Needs



APPENDIX C

STUDY 1 MATERIALS AND MEASURES

Concern for Information Privacy; adapted from Smith et al. (1996)
Here are some statements about personal information. From the standpoint of personal privacy, please indicate the extent to which you, as an individual, agree or disagree with each statement by selecting the appropriate number.
1. It usually bothers me when companies ask me for personal information. (C)
2. Companies should not use personal information for any purpose unless it has been authorized by the individuals who provided the information. (U)
3. Companies should devote more time and effort to preventing unauthorized access to personal information. (I)
4. When companies ask me for personal information, I sometimes think twice before providing it. (C)
5. Companies should take more steps to make sure that information gathered from wearable devices is accurate. (E)
6. Companies should have better procedures to correct errors in information gathered from wearable devices. (E)
7. It bothers me to give personal information to so many companies. (C)
8. Companies should never sell the personal information in their computer databases to other companies. (U)
9. Companies should devote more time and effort to verifying the accuracy of information gathered from wearable devices. (E)
10. Companies should never share personal information with other companies unless it has been authorized by the individuals who provided the information. (U)
11. Companies should take more steps to make sure that unauthorized people cannot access personal information in their computers. (I)

Vignette #1:
Please read the following scenario carefully and answer the questions that follow. Imagine that a local hospital has begun giving nurses in the emergency room smartwatches to wear at work. These smartwatches have a variety of functions typical of consumer smartwatches, including heartrate and blood pressure sensors. Based on physiological data from these devices (i.e., heart rate, blood pressure), the nurses' manager makes inferences about the level of stress nurses are experiencing at work and makes scheduling decisions based on this information. Nurses who are significantly more stressed than others are not scheduled for overtime hours until their stress levels return to their baseline levels. Since the implementation of this program, the number of errors that occur in this emergency room have been significantly reduced. Assume that you are a nurse in this hospital. From this perspective, please indicate the extent to which you agree or disagree with the following statements, where (1) is strongly disagree, and (5) is strongly agree.
If participation in this program was VOLUNTARY:

1. I would welcome the opportunity to participate in this program.
2. I would think about quitting my job after learning of the program. (R)
3. I would feel that gathering these data would be an intrusion of my privacy. (R)

If participation in this program was REQUIRED:

4. I would welcome the opportunity to participate in this program.
5. I would think about quitting my job after learning of the program. (R)
6. I would feel that gathering these data would be an intrusion of my privacy. (R)

Vignette #2:

Please carefully read the following scenario carefully and answer the questions that follow. Imagine that a local bank branch has begun giving tellers new badges to wear around their necks that are about the size of a thin deck of playing cards. These devices track how frequently each one of the tellers interact with each other, how long they talk, and the tone of their voice when they talk. These devices help measure how cohesive they are as a team, how information gets shared, how stressed employees are based on their tone of voice, and how co-workers are getting along with one another. These devices have been used in other branches to help managers identifying individuals who were being excluded from teams and identify teams that did not communicate well. The devices allowed managers to create targeted training for teams to increase teamwork, resulting in employees performing better and having more satisfaction with their jobs. Assume that you are a teller in this bank. From this perspective, please indicate the extent to which you agree or disagree with the following statements, where (1) is strongly disagree, and (5) is strongly agree.

If participation in this program was VOLUNTARY:

1. I would welcome the opportunity to participate in this program.
2. I would think about quitting my job after learning of the program. (R)
3. I would feel that gathering these data would be an intrusion of my privacy. (R)

If participation in this program was REQUIRED:

4. I would welcome the opportunity to participate in this program.
5. I would think about quitting my job after learning of the program. (R)
6. I would feel that gathering these data would be an intrusion of my privacy. (R)

Vignette #3:

Please carefully read the following scenario carefully and answer the questions that follow. Imagine that a local power company has begun giving its workers smart wristbands to wear when working in certain conditions. These devices contain sensors that gather physiological data on workers (i.e., body temperature, heart rate), atmospheric data (i.e., air pressure), location data (i.e., GPS) and an accelerometer (i.e., a sensor that measures body acceleration). This information is used to determine the risk of heat exhaustion in a worker, and to determine if a worker collapses or falls. Managers can use this information as needed to quickly advise workers to take a break until the risk of heat exhaustion is reduced, and managers can quickly dispatch emergency services to a worker's exact location if needed. This information has been used to drastically increase emergency response times for critical incidents and has nearly

eliminated injuries related to heat exhaustion. Assume that you are a worker in this company. From this perspective, please indicate the extent to which you agree or disagree with the following statements, where (1) is strongly disagree, and (5) is strongly agree.

If participation in this program was VOLUNTARY:

1. I would welcome the opportunity to participate in this program.
2. I would think about quitting my job after learning of the program. (R)
3. I would feel that gathering these data would be an intrusion of my privacy. (R)

If participation in this program was REQUIRED:

4. I would welcome the opportunity to participate in this program.
5. I would think about quitting my job after learning of the program. (R)
6. I would feel that gathering these data would be an intrusion of my privacy. (R)

APPENDIX D

STUDY 2 MATERIALS AND MEASURES

Concern for Information Privacy; adapted from Smith et al. (1996)
Here are some statements about personal information. From the standpoint of personal privacy, please indicate the extent to which you, as an individual, agree or disagree with each statement by circling the appropriate number.
1. It usually bothers me when companies ask me for personal information. (C)
2. Companies should not use personal information for any purpose unless it has been authorized by the individuals who provided the information. (U)
3. Companies should devote more time and effort to preventing unauthorized access to personal information. (I)
4. When companies ask me for personal information, I sometimes think twice before providing it. (C)
5. Companies should take more steps to make sure that information gathered from wearable devices is accurate. (E)
6. Companies should have better procedures to correct errors in information gathered from wearable devices. (E)
7. It bothers me to give personal information to so many companies. (C)
8. Companies should never sell the personal information in their computer databases to other companies. (U)
9. Companies should devote more time and effort to verifying the accuracy of information gathered from wearable devices. (E)
10. Companies should never share personal information with other companies unless it has been authorized by the individuals who provided the information. (U)
11. Companies should take more steps to make sure that unauthorized people cannot access personal information in their computers. (I)

Modified W-BNS Items (Van den Broeck et al., 2010)
Autonomy
1. At work, I would often feel like I have to follow other people's commands (R)
2. If I could choose, I would do things at work differently (R)
3. The tasks I would have to do at work are in line with what I really want to do
Competence
4. I would feel competent at my job
5. I would be good at the things I do in my job
6. I would really master my tasks at my job
Relatedness
7. I wouldn't really feel connected with other people at my job (R)
8. At work, I would feel part of a group
9. I wouldn't really mix with other people at my job (R)

Applicant Reactions (adapted from Highhouse et al., 2003)
General attractiveness
1. For me, this company would be a good place to work.
2. I would not be interested in this company except as a last resort. (R)
3. This company is attractive to me as a place for employment.
4. I am interested in learning more about this company.
5. A job at this company is very appealing to me.

Intentions to pursue
6. I would accept a job offer from this company.
7. I would make this company one of my first choices as an employer.
8. If this company invited me for a job interview, I would go.
9. I would exert a great deal of effort to work for this company.
10. I would recommend this company to a friend looking for a job.

Manipulation check (presented after each news story)
According to the news story you just read (STORY A/B/C), what will the DigiSol Smartbadge help monitor?
- Adherence to hospital policies and procedures, such as proper hand hygiene, medication administration, and patient charting, in order to ensure the best patient care.
- Location and status of providers during patient interactions, so that quick action can be taken if providers show signs of distress.
- Providers' level of stress during shifts, so that managers can account for providers' stress levels when assigning overtime or highly critical tasks.

Job Description (Adapted from St. David's Healthcare, n.d.)

FL Healthcare

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Description

Forest Lake District Hospital is part of Forest Lake HealthCare, one of the largest health systems in Texas. Forest Lake District Hospital is an acute care facility with 334 beds, offering a range of complex specialties and sub-specialties, including a nationally accredited oncology program with the area's only adult bone marrow transplant program; a trauma program that includes all of the capabilities and programmatic elements of a Level II trauma center to treat the most severely injured and critical patients; a comprehensive cardiac program; full-service maternity and newborn care with Level I and II nurseries; and two full-service emergency centers in the communities of Bear Creek and Round Rock.

We offer you an excellent total compensation package, including competitive salary, excellent benefit package and growth opportunities. We believe in our team and your ability to do excellent work with us. Your benefits include 401k, PTO medical, dental, flex spending, life, disability, tuition reimbursement, employee discount program, employee stock purchase program, and student loan repayment. We would love to talk to you about this fantastic opportunity.

POSITION SUMMARY: The Graduate Nurse Resident is a registered nurse participating in a specified training program which is standardized based on area of specialization. The training includes orientation, combined with unit based, precepted clinical experiences and didactic instruction. The Graduate Nurse Resident is under the direct supervision of their Preceptor and Supervisor Nursing Unit. According to hospital policies and procedures, by the direction of their Preceptor, the Resident assesses, plans, implements, and evaluates nursing care for assigned patients.

Immersion Residency: Details
9 to 24 weeks (depending on specialty):

- *Initial three week on-boarding, including Nursing Orientation, Immersion Orientation, education, and initial unit on-boarding*
- *Remaining 6 to 21 weeks structured to allow the majority of time to be spent on the unit of hire, with a trained preceptor*
- *Specialty education with clinical experts as well as general clinical development*

Specialties include, but are not limited to:
Medical/Surgical, Critical Care (ICU/IMC/PCU) Rehabilitation, Emergency, Oncology, Labor and Delivery, Bone Marrow Transplant, Postpartum, Neurology, Neonatal, Intensive Care, Orthopedics, Pediatrics, Telemetry, Surgical Services

.

EDUCATION: Required – Graduation from an accredited/approved school of professional nursing, no longer than six months ago. Completion of ADN or BSN degree.

Associate's Degree-Major: Nursing. Employee will enroll in a RN to BSN program within first year of employment, and graduate with BSN within three years of enrollment date.

Preferred – BSN degree

EXPERIENCE: Preferred – Experience as a Patient Care Technician in an acute care setting or capstone rotation in Forest Lake HealthCare facilities.

LICENSE/CERTIFICATION: Required – Must pass NCLEX exam and have a current Texas RN License verifiable on the Texas Board of Nursing website, prior to your first day of employment. Current BCLS provider card also required.
Preferred – Registered Nurse license by the Texas Board of Nurse Examiners. If compact license held, RN is required to obtain a Texas RN license within 90 days of their hire date

Story A – Administrative Monitoring (Adapted from Business Wire, 2020)

Forest Lake District Hospital Prepares for Future Smart Hospital with Digital Solutions

July 08, 2021 08:02 AM Eastern Standard Time

AUSTIN, Texas --(BUSINESS DAILY)--DigiSol, Inc. (NYSE:DSOL), a recognized leader in digital clinical workflow solutions, today announced that Forest Lake District Hospital (FLDH) in Austin, Texas is deploying intelligent digital solutions from DigiSol to help protect and connect care teams now and beyond COVID-19. FLDH is in the midst of redevelopment (the Sam Houston Hospital Project) with planning partner Travis Health Advisory, which will serve residents of Austin and a large surrounding area. This new hospital will be built on a strong digital foundation.

Strategic planning for the updated facility includes hardwiring best practices and proven technologies in the existing hospital to ensure the planned smart hospital has the best services and solutions when the doors open in a few weeks. Among those solutions are the wearable DigiSol Smartbadge, which captures a variety of data about the wearer. Powered by the DigiSol Platform, these wearable solutions can help monitor adherence to hospital policies and procedures, such as proper hand hygiene, medication administration, and patient charting, in order to ensure the best patient care. Encouraging and monitoring compliance with hospital policies and procedures is of the utmost importance, according to hospital administrators.

“As we look forward to completing renovations, we want to make sure we already have a reliable and secure

Note. Only the first two paragraphs were legible for each news story.

Story B – Employee Well-Being Monitoring (Adapted from Business Wire, 2020)

Forest Lake District Hospital Prepares for Future Smart Hospital with Digital Solutions

July 08, 2021 08:02 AM Eastern Standard Time

AUSTIN, Texas --(BUSINESS DAILY)--DigiSol, Inc. (NYSE:DSOL), a recognized leader in digital clinical workflow solutions, today announced that Forest Lake District Hospital (FLDH) in Austin, Texas is deploying intelligent digital solutions from DigiSol to help protect and connect care teams now and beyond COVID-19. FLDH is in the midst of redevelopment (the Sam Houston Hospital Project) with planning partner Travis Health Advisory, which will serve residents of Austin and a large surrounding area. This new hospital will be built on a strong digital foundation.

Strategic planning for the updated facility includes hardwiring best practices and proven technologies in the existing hospital to ensure the planned smart hospital has the best services and solutions when the doors open in a few weeks. Among those solutions are the wearable DigiSol Smartbadge, which captures a variety of data about the wearer. Powered by the DigiSol Platform, these wearable solutions can help monitor the location and status of healthcare providers during patient interactions, so that quick action can be taken if providers show signs of distress. Monitoring the safety of providers at all times is of the utmost importance, according to hospital administrators.

“As we look forward to completing renovations, we want to make sure we already have a reliable and secure

Note. Only the first two paragraphs were legible for each news story.

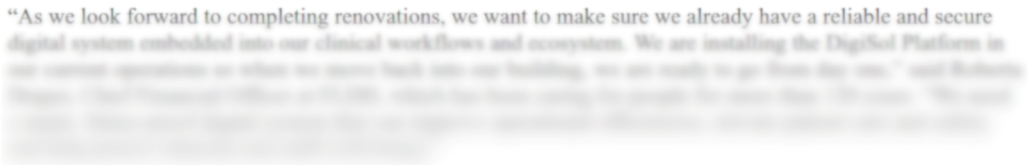
Story C – Stress Monitoring for Scheduling (Adapted from Business Wire, 2020)

Forest Lake District Hospital Prepares for Future Smart Hospital with Digital Solutions

July 08, 2021 08:02 AM Eastern Standard Time

AUSTIN, Texas --(BUSINESS DAILY)--DigiSol, Inc. (NYSE:DSOL), a recognized leader in digital clinical workflow solutions, today announced that Forest Lake District Hospital (FLDH) in Austin, Texas is deploying intelligent digital solutions from DigiSol to help protect and connect care teams now and beyond COVID-19. FLDH is in the midst of redevelopment (the Sam Houston Hospital Project) with planning partner Travis Health Advisory, which will serve residents of Austin and a large surrounding area. This new hospital will be built on a strong digital foundation.

Strategic planning for the updated facility includes hardwiring best practices and proven technologies in the existing hospital to ensure the planned smart hospital has the best services and solutions when the doors open in a few weeks. Among those solutions are the wearable DigiSol Smartbadge, which captures a variety of data about the wearer. Powered by the DigiSol Platform, these wearable solutions can help monitor providers' level of stress during shifts, so that managers can account for providers' stress levels when assigning overtime or highly critical tasks. Monitoring and accounting for providers' well-being when engaging in workforce planning is of the utmost importance, according to hospital administrators.



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