Electronic Monitoring and Self-Regulation: Effects of Monitoring Purpose on Goal State, Feedback Perceptions, and Learning

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B.S. in Psychology, June 2010, The Ohio State University

A Dissertation submitted to

The Faculty of
the Columbian College of Arts and Sciences
of The George Washington University
in partial fulfillment of the requirements
for the degree of Doctor of Philosophy

May 17, 2015

Dissertation Directed by

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Electronic Monitoring and Self-Regulation: Effects of Monitoring Purpose on Goal State, Feedback Perceptions, and Learning

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Dedication

To my grandparents, whose appreciation for education opened a world of opportunity.

Acknowledgements

I am grateful to the aid provided by GWU and the SIOP Foundation in support of my dissertation. These scholarships and fellowships were instrumental in helping me complete my dissertation in a timely manner.

I would like to express my highest gratitude to my advisor and mentor, Tara Behrend. Her dedication to her students' personal and professional development is truly unmatched and the reason for my graduate and professional accomplishments. I will forever strive to uphold the standard of excellence she has set.

I would also like to extend thanks to my committee members. David Costanza, Sharon Hill, Tonya Dodge, and Katherine Ely not only helped me develop the ideas presented in this dissertation, but each had a unique developmental role in my graduate career. I am grateful for the guidance they have each provided me with throughout my time at GWU and at Fors Marsh Group.

Many students at GWU have helped support me academically and personally through my graduate career, including graduate students and members of the WAVE lab. In particular, I would like to thank Garett Howardson who spent hours discussing research, statistics, and scientific philosophy with me. I will hold close the memories we shared and the lessons he has taught me.

Finally, I am forever grateful to my family and friends who have supported me in every decision I have made. No accomplishment is truly mine, for each one will always be a direct result of my parents' support and guidance. My fiancée Ann has taught me what it means to be a truly dedicated and focused researcher and a patient individual. I will continuously seek to find ways to support her in the ways she has supported me

Abstract of Dissertation

Electronic Monitoring and Self-Regulation: Effects of Monitoring Purpose on Goal State, Feedback Perceptions, and Learning

In order to remain effective in an increasingly digital workplace, many organizations have shifted towards the automatic and electronic collection of employee performance data. For example, employees completing computer-based training may be monitored to collect objective performance information for either developmental or administrative purposes. Though this allows for more objective employee feedback and evaluation, little remains known about the effect of pervasive electronic monitoring on key self-regulatory processes which underlie learning. This study was designed with this gap in mind and explores the relationship between electronic monitoring type (developmental or administrative), goals, and feedback perceptions, feedback usage, and learning. In order to understand this relationship, the current study extends classical theories of performance management and self-regulation to supplement emerging research on electronic monitoring. Results of this experiment suggest that monitoring purpose does not have a strong impact on state goals. Monitoring purpose, however, may affect feedback perceptions. Using the results of this study, evidence-based recommendations can be made for the theoretical understanding and practical of monitored training.

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Chapter 1: Introduction

Traditional face-to-face training delivery methods are used to build employees' skills and can benefit individuals, organizations, and society as a whole (Brown & Sitzmann, 2011; Aguinis & Kraiger, 2009). As organizations shift from this traditional delivery method to one that is enhanced by technology, more flexible (DeRouin, Fritzsche, & Salas, 2004; Welsh, Wanberg, Brown, & Simmering, 2003), and potentially more interactive (Kraiger, 2008), there is an increased need to understand effective and ineffective technology-enhanced training delivery methods (DeRouin et al., 2004).

Monitored training is one such integration of technology and training. Monitored training is broadly described as the automatic collection of electronic trainee data during e-learning (Watson et al., 2013). The desire to monitor trainees during e-learning is driven primarily by two distinct reasons. First, monitoring gives organizations data on trainee enrollment, engagement, and completion. Contrasted with face-to-face training, organizations are traditionally less aware of learner behaviors and engagement during e-learning. In face-to-face training, instructors can take attendance to ensure that learners are actually attending training and monitor trainees to determine how engaged each is during training. E-learning, on the other hand, is a black box for organizations where they may not know whether learners have attended training and how engaged they were during training. Second, monitoring trainees creates the potential for reactive and adaptive training. Traditionally, e-learning was considered static as it often took the form of non-interactive videos or lecture slides. Monitoring may create the potential for e-learning to be reactive to learners' progress, much like an instructor would be. For example, monitoring systems described by Bell and Kozlowski (2002) actively react and adapt to learner progress and provide learners with tailored suggestions based on this

progress. This automatic adjustment and reaction is important as research on e-learning has suggested that many learners are unwilling or unable to engage in self-regulatory processes necessary for monitoring their own progress (Bell & Kozlowski, 2002; Brown, 2001).

The current study extends existing notions that training design and delivery methods can directly affect individual outcomes, such as learning and satisfaction (Orvis, Fisher, & Wasserman, 2009; Sitzmann, Kraiger, Stewart, & Wisher, 2006), by examining the effects of monitoring purpose on key self-regulatory processes. Two distinct monitoring purposes are identified: *Administrative monitoring*, which may be used to determine whether learners have fully completed training, engaged with content, and not misused learner control features (Thompson, Sebastianelli, & Murray, 2009), and *developmental monitoring*, which may be implemented in order to help trainees develop their skills (Bell & Kozlowski, 2002; Sitzmann, Bell, Kraiger, & Kanar, 2009). Despite relying on identical technology, there is reason to believe that developmental and administrative monitoring systems may have differential effects on self-regulatory processes.

It is proposed that monitoring purpose directly affects goal setting, the first stage of self-regulation. Classical self-regulation research has identified two separate types of goals: mastery and performance. Whereas individuals with a mastery goal might focus on learning instructional material to enhance self-competence, those with a performance goal might focus on learning instructional material in order to appear competent to others (DeShon & Gillespie, 2005). These goals are important because they shape learners' interactions with training content, reactions to feedback, and intentions to use feedback

(Elliot & McGregor, 2001). For example, individuals with a mastery goal tend to view feedback as an opportunity for self-development and may be more likely to act upon feedback and individuals with a performance goal may be more likely to view feedback as evaluative and self-threatening (Dweck & Leggett, 1988; Stevens & Gist, 1997). As such, goals are an essential part of self-instruction and e-learning since they shape learners' perceptions of, and reactions to, feedback.

The notion that monitoring purpose affects goal setting is based in evidence that learners' goals may be determined by the situation, such that particular cues can elicit one goal or another (Button, Mathieu, & Zajac, 1996; Deshon & Gillespie, 2005). For example, highly evaluative contexts may be more likely to elicit performance goals and highly developmental contexts may be more likely to elicit mastery goals (Sansone, Sachau, & Weir, 1989). Because monitoring represents a situational context, the effect of monitoring on self-regulation should be dependent on whether monitoring is developmental or evaluative (i.e., the purpose of monitoring).

As such, the current study proposes that monitoring type affects goal setting through creating a strong developmental or evaluative context. This relationship is important since the goals that learners set drive feedback perceptions, feedback usage, and ultimately learning. This model is graphically depicted in Figure 1 and serves as the basis of the current study. In order to develop hypotheses further, it is essential to understand the full context surrounding monitored training. The following chapter reviews research on e-learning and electronic performance monitoring as a whole. This review provides context for why monitoring might be implemented and further clarifies the characteristics of monitoring programs. Following this review, self-regulation

research is reviewed in order to understand why and how monitoring might influence self-regulation. Finally, these two streams of research are integrated to form hypotheses regarding monitoring type, goals, and feedback perceptions and usage.

By doing so, the current study provides significant contributions to a number of research streams. First, the current study contributes to the theoretical development of e-learning. Recently, research has begun to examine various aspects of monitoring. For example, Kanar and Bell (2013) examined how feedback framing might influence self-regulation and Watson et al. (2013) examined how monitoring synchronicity affects self-regulation. Both of these examine related, but non-overlapping, areas of monitored training. The current study contributes to this growing literature by examining an additional area of monitored training, namely monitoring type. Second, few studies have examined feedback perceptions and usage in e-learning. With the increased array of information available to organizations as a result of monitored training, it is essential to understand the factors that influence whether learners might actually use this feedback and perceive it as useful. Third, the study contributes to the practical development of e-learning programs. By understanding how training design, such as monitoring, influences proximal states (such as goal setting and feedback perceptions), the current study is well-positioned to provide recommendations for developing effective e-learning. The current study thus contributes to both the practical and theoretical development of e-learning and monitored training.

Chapter 2: Literature Review

Self-regulatory processes are essential to self-instruction and may be affected by contextual factors, such as training technology. The current study integrates research on e-learning with research on self-regulation in order to understand these effects. In order to do so, it is necessary to review the broader context surrounding monitored training and why organizations might implement this technology. As such, this literature review is divided into two sections. The first section reviews e-learning research in order to understand why organizations might implement monitoring technology and differences in how monitoring technology can be applied. The second section reviews self-regulation research with a focus on how contextual factors (such as monitoring) might influence early stages of self-regulation (such as goal setting). Separating these into their individual sections allows for full development of each before they are integrated.

Review of E-Learning and Electronic Performance Monitoring Literatures

Prior to e-learning's popularity, organizations primarily relied on face-to-face training in order to develop employees' skills. As e-learning emerged, organizations took advantage of the ability to present information in multiple forms of media, such as video, audio, and simulations (DeRouin et al., 2005; Kraiger, 2008). E-learning presented a number of additional benefits to organizations and trainees that led to its high adoption rates, such as increased customizability, flexibility, and satisfaction. Each of these has implications for how learners self-regulate throughout training and interact with training content.

First, e-learning is more customizable than face-to-face training. Learner control features allow learners to have some input regarding the content that is being presented, the order it is being presented in, and how this information is being presented (Kraiger &

Jerden, 2007). These learner-controlled training programs offered trainees the opportunity to thoroughly interact with training content. One touted benefit of learner control was that those that already had familiarity in introductory topics would be able to skim or skip these areas, saving their cognitive resources for more demanding, challenging, or relevant content (Orvis et al., 2009). This would in essence create training that could be customized to each learner individually. By doing so, learners are able to have increased autonomy during training, which classical research suggests would lead to subsequent increases in motivation and engagement (Ryan & Deci, 2000).

Second, e-learning is more flexible than face-to-face training (Welsh et al., 2003). This flexibility allows organizations increased savings in training and development (Noe, 2010), but also provides learners with another opportunity to exert control over training (Karim & Behrend, 2014). This permits personnel completing mandatory compliance training can choose to pause training to take a break; choose to train during a break in the day, or in five-minute increments throughout the day; and choose to complete the in the office or at home. By providing learners with training that is more flexible to their schedule and needs, e-learning again has the potential for greater autonomy than face-to-face training. That is, in addition to having input over what content is being presented or the pace at which it is being presented, learners can also have input over the time and location of training.

Third, and perhaps as a result of the first two points, trainee satisfaction is often higher in e-learning than it is in face-to-face training (Sitzmann, Brown, Casper, Ely, & Zimmerman, 2008) and higher when learners have control over their training (Orvis et al., 2009). Trainee reactions, such as satisfaction, might be particularly important in

computer-based instruction. Trainee reactions have been linked to learner engagement (Sitzmann et al., 2008), training intentions, and intentions to enroll in future courses (Brown, 2005; Long, DuBois, & Faley, 2008). The higher levels of autonomy learners experience as a result of increased flexibility and customizability may be driving this increased satisfaction (Orvis et al., 2009), since a sense of control over one's actions and self is a critical component of satisfaction and well-being (Lang & Heckhausen, 2001; Ryan & Deci, 2000).

Thus far, it has been suggested that e-learning provides learners with greater autonomy by allowing them to provide input into the presentation and administration of training. This is in contrast to face-to-face training, wherein lecturers and trainers have control over these elements. Contrary to classical notions that increased autonomy is better, training may be a case where autonomy results in satisfaction but not necessarily learning (Kraiger & Jerden, 2007). In a classroom, it is the lecturer's or instructor's job to actively monitor student or trainee progress and adapt the presentation of information as needed (Noe, 2010). Instead of learners making decisions about training content, it is the instructor's role to determine the content that is appropriate to cover given the experience of the audience, the order and pace at which information is covered, and the number and duration of practice opportunities or breaks. By monitoring trainee progress and engagement, instructors can decide to increase or decrease the difficulty of content, give learners a break, or give additional practice opportunities. In many senses, this frees cognitive resources from learners and allows them to focus on training content (Kanfer & Ackerman, 1989).

In fact, self-regulation and e-learning research suggests that increased autonomy may only enhance learning under limited circumstances (Kraiger & Jerden, 2007). This may be a result of three distinct reasons. First, these learner control features may require learners to continuously make decisions regarding their training (Brown, 2001). As Brown and Ford (2002) state, "Once the computer program is set up, the burden for active learning switches to the learner" (p. 194). Active learning requires learners to make decisions about training and navigational features that may be mentally distracting from training content. Given a fixed set of cognitive resources, learners who are distracted by navigational materials or focused on self-regulation may have fewer cognitive resources to dedicate to training content itself (Kanfer & Ackerman, 1989; Karim & Behrend, 2014). Second, not all learners are willing to use learner control appropriately (Brown, 2001; Kraiger & Jerden, 2007; Steinberg, 1989). For example, whereas motivated learners might control to engage more deeply with the training content, unmotivated ones might use this same control to disengage completely (Brown, 2001).

Third, self-paced learning requires learners to engage in self-regulation and self-monitoring and may require learners to make decisions about training content (Kraiger & Jerden, 2007). Although they enjoy the increased autonomy that comes from e-learning, learners might not be effective decision-makers when it comes to their own learning (Kruger & Dunning, 1999). Classical metacognitive research has demonstrated that individuals may lack the skills for self-driven instruction (e.g., Kruger & Dunning, 1999). In order to make effective decisions about training, individuals must be able to create schemata that summarize the information known about training content (Lawless & Brown, 1997). A schema represents an individual's knowledge of the world and their

own abilities (Armbruster, 1986). Individuals are, however, notoriously poor judges of their own ability and may be overconfident in their shortcomings (Kruger & Dunning, 1999). For example, meta-cognitive perceptions and judgments may be affected by heuristics and biases (Schwarz, Bless, Strack, Klumpp, Rittenauer-Schatka, & Simmons, 1991; Tversky & Kahneman, 1973). As such, decisions based on these biases may result in ineffective learning strategies. Given the prevalence of biases in the metacognitive processes underlying learning, it should come with little surprise that learners might misuse control features as a result of this overconfidence, despite having the option to use control (Bell & Kozlowski, 2008; Kirschner, Sweller, & Clark, 2006). This is especially true in highly complex training, where learners might overstate their ability create effective learning schema (Granger, 2012). Thus, although there is some evidence for a positive relationship between learner control and learning (Fisher, Wasserman, & Orvis, 2010; Reeves, 1993), research elsewhere has suggested this might not always be the case (e.g., Bell & Kozlowski, 2002; Carolan, Hutchins, & Wickens, 2014; Granger, 2012; Karim & Behrend, 2014).

The desire to monitor employees during e-learning arose out of the above notion that not all learners are willing or able to effectively self-regulate throughout self-paced training. Monitoring was proposed as a method of collecting detailed information on learners' in-training decisions and attention. With monitored training programs, learners are still able to exercise control over their learning by using learner control features. However, organizations are now able to gather information on exactly how learners are using these features and more detailed information on learners' in-training behaviors (Kaner & Bell, 2013; Watson et al., 2013). In essence, monitored training collects

detailed information about how learners use control, navigate through training content, and self-regulate throughout the course of training. This information can play a crucial role in theoretical development (Orvis et al., 2009), employee development (Bell & Kozlowski, 2002), and training evaluation (Thompson et al., 2009).

Electronic Performance Monitoring: Prevalence and Types

Monitored training is one of many examples of how organizations have been using automatically collected electronic data. It seems that the shift toward digital work has made organizations concerned over effectively evaluating employee performance. In fact, the Society for Industrial and Organizational Psychology (SIOP) cited employee monitoring and tracking software as a top trend for workplaces in 2014. With the increasing expansion of monitoring technology to a variety of workplace decisions (including personnel selection, training, and performance management; Lohr, 2013; Peck, 2013; Stanton, 2000), researchers have dedicated substantial effort to understanding the effects of monitoring on employee performance. For example, Stanton (2000) has described the application of monitoring to employee performance, Watson et al. (2013) to training (monitored training), and Karim, Kaminsky, and Behrend (2014) to personnel selection.

Electronic monitoring is broadly defined in the current study as the electronic and automatic collection of performance data across a variety of work contexts. More specifically, monitored training is defined as the electronic collection of learner behaviors during computer-based training. In many ways, EPM is used to recreate face-to-face environments. For example, using EPM during employee selection tests can help recreate a proctored environment (Karim et al., 2014). Similarly, EPM may be implemented in training in order to recreate the face-to-face experience of capturing learner attendance

and engagement during the training itself. However, there are reasons to believe that EPM is substantially different from face-to-face monitoring during training. For example, learners in classroom settings are directly aware of what is being measured and when. Learners in an online setting, on the other hand, may not be aware of exactly what is being measured and may be subject to constant monitoring (Alge, Ballinger, & Green, 2004). Similarly, information collected during face-to-face training may be subject to the biases of the trainer and there is a general lack of social context when information is collected electronically. Information collected during online training is considerably more objective and less likely to be subject to biases and monitored individuals may lack social cues and feedback regarding the information being collected (Stanton, 2000). This may be why computer-based monitoring may be more perceived as more procedurally-, but less interpersonally-, just than face-to-face supervision (McNall & Roch, 2007). As such, there is reason to believe that EPM implemented during training may have more pronounced or unique effects than traditional instructor-based monitoring.

However, electronic monitoring is not simply one thing. In fact, monitoring technology may differ in a number of systematic ways, including its synchronicity (the extent to which data is being collected and analyzed in real-time; Douthitt & Aiello, 2001; Stanton, 1996; Stanton & Sarkar-Barney, 2003; Watson et al., 2013) and its purpose (the extent to which monitoring is framed as a developmental or evaluative tool; Stanton, 2000); both of which may influence cognitive, affective, and behavioral outcomes (Stanton, 2000). In order to understand how monitoring purpose can influence these outcomes, it is first necessary to fully define each purpose.

Purpose. Data collected from electronic monitoring systems may be used for either developmental or administrative purposes (Stanton, 2000). In this sense, electronic monitoring is similar to traditional performance monitoring. Both collect information regarding employee performance (either electronically or through behavioral observation). This information may be then incorporated into annual performance evaluation cycles or developmental feedback (Stanton, 2000).

Through collecting information regarding learners' in-training behaviors, administrative monitoring programs are designed to enhance the effectiveness of training through increased information to management (Aiello & Svec, 1993). For example, administrative monitoring might be used when researchers are completing mandated human subjects protection training to ensure that they are spending sufficient time reading each module, not searching for answers online, and have fully completed all required modules. Automatic data collection during this training can provide a more detailed evaluation of trainee performance than traditionally captured by post-test declarative knowledge. A number of additional examples of administrative monitoring have recently been described in popular media. For example, Wong (2013) describes software that uses built-in cameras to track employees' eye movements during training. This software could be easily downloaded and installed on company computers and tablets. If the program senses a decrease in attention, it pauses until the employee focuses back on the training. Similar software has been integrated into popular smartphones, suggesting similar software could be applied to a variety of emerging technology. The software also collects information regarding trainees' progress throughout training and provides comprehensive reports outlining the sections of training that employees have

completed as well as the time spent per section. Such comprehensive reports detailing the amount of time each employee spends on training and their progress throughout the course have become commonplace in a variety of LMSs (Noe, 2010).

Within organizations, this type of administrative monitoring may be used to determine whether or not learners have satisfactorily completed training. Summaries of learner behaviors may be examined to determine specific modules which did not receive full attention and, in this sense, monitoring may be used to inform personnel decisions surrounding company mandated training. In contexts outside of organizations, such as online certification and courses, information collected from monitoring may be used for administrative purposes in that it can inform whether or not learners received outside help or paid attention during required modules. This information is not only needed to determine whether or not learners satisfactorily completed various modules, but is also needed in a more global sense to maintain the integrity of online certification programs.

Alternatively, organizations may collect information on employees during training (e.g., progress, completion rates, and attention focus) in order to foster employee development. For example, if the system described by Wong (2013) was used only for developmental purposes, employees could be provided with detailed feedback regarding their training behaviors or learning strategies. Similarly, a professor may use the tools Blackboard provides to send students mid-semester feedback or to provide students suggestions on how to improve in the class.

Despite having different motives, developmental and administrative monitoring both rely on the same technology. For example, many universities provide faculty and students access to Blackboard's LMS. Blackboard allows faculty to post course content,

including important announcements, syllabi, assignments, optional readings, and even full lectures online for students to access at any time. This allows students who were absent from class to still receive the day's lecture and allows all students to have access to these lectures when reviewing for exams and assignments. Professors who use Blackboard are provided with up-to-date information regarding learner engagement, including the date and time the student last accessed Blackboard and whether a student has downloaded a particular assignment or lecture. Blackboard's new *retention center* combines all of these student metrics, among others, into one easily used dashboard. The data collected and presented by Blackboard is a form of monitoring. It is up to the professor to determine whether they will use this information to evaluate whether students are engaging with course content (administrative monitoring) or to provide students with tailored suggestions on how to succeed in the course (developmental monitoring).

Importantly, monitoring is simply a means through which objective information is automatically collected. This information serves no inherent purpose until it is received or used by some entity. An automatic system or an individual must decide how information will be used and whether it will be used in a developmental or an administrative sense. As such, it is learners' perceptions regarding monitoring that are of utmost importance since the purpose a learner attributes to monitoring is more likely to influence their behaviors than the objective purpose itself.

Research on monitored training. Developmental monitoring has been the primary focus of e-learning researchers, despite it not being called directly as such. For example, Sitzmann and colleagues (e.g., Sitzmann et al., 2009; Sitzmann & Ely, 2010)

describe software that tracks learners' progress and provides them with prompts to refocus their attention. Evidence provided by Sitzmann and her colleagues seems to demonstrate that such prompts can be effective in facilitating effective learning strategies (Sitzmann et al., 2009).

Elsewhere, Bell, Kozlowlski, and their colleagues (e.g., Bell & Kozlowski, 2002; Kanar & Bell, 2013) have described programs based on the principle of adaptive guidance. Adaptive guidance, introduced by Bell and Kozlowski in 2002, was based on the extant instructional method of *advisement*. Advisement provides individuals with the information necessary to make effective decisions regarding their learning (Santiago & Okey, 1992). Much of this research was in fact based in researchers attempting to find a middle-ground between program-controlled training (i.e., training that lacks learner control) and learner-controlled training. Since learners enjoyed having control over instructional features (Park & Tennyson, 1983), but these control features were often associated with decreased learning (Tennyson, 1980), advisement was proposed as a method for integrating the affective benefits of learner control with the cognitive benefits of program control. Learners had freedom to make a variety of decisions regarding the pace, content, or sequence of training material but were provided with useful suggestions on how to best use this control (Tennyson & Buttrey, 1980).

Adaptive guidance relies on the same electronic monitoring techniques described above. As noted by Bell and Kozlowski (2002), "It utilizes computer technologies to monitor and assess individuals' progress, and provides trainees with recommendations based on these evaluations" (p. 270). Adaptive guidance seeks to collect detailed information regarding employee progress through training and on learning strategies in

order to provide detailed and tailored feedback and recommendations to facilitate learning. This feedback may then be subsequently framed as either autonomy-supportive (e.g., "you might want to") or controlling (e.g., "you should"), with greater learning occurring for controlling feedback (Kanar & Bell, 2013). By providing learners with reminders to focus their attention on training content (Sitzmann et al., 2009) or with detailed feedback regarding their in-training behaviors (Bell & Kozlowski, 2002), developmental monitoring programs are designed to enhance the effectiveness of training through increased feedback to the learner.

Adaptive guidance is heavily integrated into self-regulatory processes and designed to address many of the cognitive biases described above. This deep integration is the primary advancement of adaptive guidance over advisement techniques (Bell & Kozlowski, 2002). Specifically, adaptive guidance targets self-monitoring and is designed to facilitate strategy revisions. The intention is to provide learners with more feedback about their training performance during the training itself along with recommendations on how to better learn material based on their performance. By providing learners with tailored and detailed information about their progress throughout training and strategies that can be used to facilitate the development of essential knowledge and skills, adaptive guidance is a form of a feedback intervention.

Since monitoring directly targets self-regulatory processes (such as goal setting and revisions), it stands to follow that electronic monitoring may impact key self-regulatory processes during learning. Furthermore, classical self-regulation research provides evidence to believe that the exact type of monitoring might differentially affect these processes. With this in mind, the following section provides an overview of the

theoretical foundations necessary to understand the differential impact of administrative and developmental monitoring. It is proposed that monitoring purpose influences goal states, the first stage in the self-regulatory cycle. To support this proposal, the self-regulatory process is described below with a focus on goals, their situational specificity, and their impact on feedback perception and usage. In order to provide this overview, research is integrated from performance management and training literatures.

Overview of Self-Regulation Research

Monitoring purpose (i.e., developmental or administrative) may affect self-regulatory processes during learning. In order to understand the relationship between monitoring purpose and self-regulatory processes, the current study draws upon self-regulatory theories that identify two distinct stages of performance: goal setting and goal striving (Diefendorff & Lord, 2008). Goal-orientation theory defines goals as action patterns used in achievement situations that are affected by both trait and situational components (DeShon & Gillespie, 2005). These achievement goals have been shown to affect a number of key processes, such as feedback perceptions (Dweck & Leggett, 1988), intentions to use feedback (Ilgen, Fisher, & Taylor, 1979), and ultimately learning (Payne, Youngcourt, & Beaubien, 2007). Thus, goals are considered to play a key role in the learning process and are of central importance to the current study. The theoretical overview below details the self-regulatory process, including the situational emergence of learning goals.

Self-Regulation: Goal Setting, Feedback Perceptions, and Behavioral Change

The self-regulatory process. The self-regulatory process broadly involves two interdependent and cyclical stages: Goal setting and goal striving. Goals reflect learners' action patterns used in achievement settings (DeShon & Gillespie, 2005). Behavior is

generally described as goal-directed, with goals conceptualized as internal representations of desired end states (Diefendorff & Chandler, 2010). These goals are generally hierarchically arranged, such that any one goal does not exist in a vacuum and is directly affected by its link to higher-order goals (DeShon & Gillespie, 2005; Diefendorff & Chandler, 2010). In this sense, motivation is best described as a discrepancy reduction strategy, in which effort is directed towards goals with the greatest discrepancy between ideal and current states (DeShon & Gillespie, 2005). Feedback is used to provide information regarding the degree of discrepancy, or error, between a current state and a desired state (DeShon & Gillespie, 2005). As individuals make progress toward one goal (i.e., reduce the discrepancy on that activated goal), they shift their attention toward other activated goals (Fishbach & Dhar, 2005). As such, discrepancies are detected and reduced over time in a systematic and universal way (Diefendorff & Chandler, 2010; Ilies & Judge, 2005); this cyclical and interdependent process is the foundation of self-regulation. Relevant to the current study is the emergence of goals and the interplay between goals and feedback perceptions.

The structure and importance of goals. As described above, goals reflect desired end states that have been activated in some way (DeShon & Gillespie, 2005). The most prominent goal theory was proposed by DeShon and Gillespie in 2005. Deshon and Gillespie's (2005) Motivated Action Theory (MAT) identifies two broad categories of goals, based on the work of Dweck and her colleagues (e.g., Dweck & Leggett, 1988). Deshon and Gillespie define *performance goals* as those focused on demonstrating one's competence to others and *mastery goals* as those focused on increasing one's competence (Dweck & Leggett, 1988; Elliot & McGregor, 2001).

The original research on mastery and performance goals was primarily driven by Dweck and her colleagues. Dweck and Leggett (1988) state that mastery and performance goals are primarily representative of response patterns to performance feedback. Early research focused on what was described as *adaptive* and *maladaptive response patterns*. The maladaptive response pattern is most often seen when learners are pursuing performance goals and results in performance discrepancies being attributed to personal inadequacy and resulting in negative affect. Alternatively, Dweck and Leggett (1988) described an *adaptive response pattern* in which performance discrepancies are viewed as an opportunity for growth and not attributed to personal inadequacy. Dweck and Leggett (1988) noted that the adaptive response pattern was most often observed in individuals pursuing mastery goals. This overall finding led Dweck and Leggett (1988) to conclude that goal choice crates a situation in which the same outcome is interpreted differentially across individuals. Because they influence perceptions of feedback, goals are a central part of the self-regulatory process.

Subsequent research in both social and Industrial/Organizational psychology has built upon Dweck and Leggett's (1988) original notions of adaptive and maladaptive response patterns. For example, Stevens and Gist (1997) suggested that mastery and performance goals create a framework for interpreting and responding to events that occur during task performance. In line with Dweck and Leggett's (1988) theory, Stevens and Gist (1997) suggest that individuals pursuing performance goals tend to view outcomes as diagnostic of their ability level. When faced with a performance discrepancy, these individuals see little value in exerting additional effort or changing task strategies.

Similarly, Bobko and Coella (1994) have suggested that an individual's goal shapes their interpretation and perception of the purpose of feedback.

VandeWalle and his colleagues have been instrumental in advancing the relationship between goals and feedback perceptions. For example, VandeWalle and Cummings (1997) found that across two studies, individuals pursuing mastery goals were more likely to seek post-performance feedback. In 2001, VandeWalle et al. argued that though mastery and performance goals are useful in predicting performance, their true utility is in their ability to describe reactions to performance feedback. VandeWalle and colleagues' findings are in line with meta-analytic evidence provided by I/O psychologists suggesting that feedback is best delivered when it is not viewed as evaluative (Kluger & DeNisi, 1996).

Similar patterns have been noted within multi-source evaluations. For example, DeShon and Gillespie (2005) and Brett and Atwater (2001) note that individual reactions to the multi-source feedback process are largely determined by their patterns of goal activations. Whereas one individual might view this feedback as highly informative and useful, another might view this same information as a threat to their self-esteem or affiliation. Ultimately, patterns of goal activation can affect individuals' reactions to and perceptions of the feedback process.

In summary, individuals with a mastery goal tend to interpret feedback as useful, diagnostic, and as a way to correct errors while individuals with a performance goal tend to view feedback being viewed as evaluative and judgmental about the self (VandeWalle et al., 2001). Individuals pursuing mastery goals may use performance feedback to evaluate their performance, redirect attention toward acquiring knowledge related to this

feedback, and will not be concerned with mistakes during the learning process (DeShon & Gillespie, 2005). Individuals pursuing a performance goal, however, will likely interpret this feedback as evaluative and anxiety-evoking (DeShon & Gillespie, 2005).

Situational specificity of goals. Whereas the research above was primarily conducted on situationally-specific goals, much of the research on achievement goals within workplace settings has focused on *goal orientation*, a dispositional variable that reflects an individual's tendency to pursue a particular goal (i.e., either mastery or performance; DeShon & Gillespie, 2005). Individuals with a performance orientation, for example, will tend to set performance-focused goals and focus on how their performance is viewed by others across a variety of situations.

Due to its dispositional nature, the relationship between trait goal orientation and training outcomes within a particular situation may be weak (Payne et al., 2007). More proximal to behaviors are the *state goals* describe above, which reflect the goal being pursued by an individual within a particular context (DeShon & Gillespie, 2005). These state goals may represent and interaction between trait goal orientation and situational factors (Button et al., 1996; Payne et al., 2007). For example, Button et al. (1996) suggested that in the absence of situational cues, an individual will tend to set goals in line with his/her dispositional goal orientation. However, situational characteristics may result in incongruence between trait goal orientation and state goals.

Researchers have largely supported Button et al.'s (1996) suggestion that goal state may be affected by situational cues (e.g., Elliot & Dweck, 1988; Gist & Stevens, 1998; Kozlowski et al., 2001; Kraiger, Ford, & Salas, 1993; Martocchio, 1994; Stevens & Gist, 1997). In fact, a number of studies rest on the notion that goal state can be

experimentally manipulated through framing effects. For example, Sansone et al. (1989) demonstrated that goal state can be manipulated by simply altering the framing of the performance task. In one study presented by Sansone et al. (1989), the authors manipulated the description of an activity to either emphasize exploration or skill and performance. They concluded that differences in this frame affected individuals' goals which drove task enjoyment and persistence. Thus, it seems that goals are best considered as situationally-specific (DeShon & Gillespie, 2005).

Applying this research to multi-source evaluations, Brett and Atwater (2001) had hypothesized that goal orientation would moderate the relationship between ratings and perceived accuracy and reactions. They note that the non-significant relationship found between goal orientation and feedback perceptions may be a result of the difference between state goals and trait goal orientation. As discussed above, situations may evoke non-congruent goals in individuals (Button et al., 1996), such that individuals with a mastery orientation develop performance goals within a particular context. In fact, Brett and Atwater (2001) note that, "the 360 process may create an 'evaluative' context in which a performance-prove goal orientation has been induced by the situation" (p. 938). As such, Brett and Atwater (2001) support the notion that situational contexts and cues may drive goal state.

The person by situation perspective of goal setting is prevalent throughout psychology research and is reflective of the classic person-situation debate fueled by Mischel's (1968) book. Though there is generally consensus that personality is fairly stable longitudinally and can be used to predict life and organizational outcomes (e.g., Judge, Higgins, Thoresen, & Barrick, 1999; Barrick, Mount, & Judge, 2001; Barrick &

Mount, 1991), it is also accepted that the expression of personality traits is affected by situational cues that can result in high levels of intraindividual variance (e.g., Fleeson, 2001). Building upon this perspective, models of organizational behavior (e.g., within training) have been created to account for a person by situation interaction (e.g., ATI). Thus, though the interactionist is framed differently in each subfield (e.g., social cognition research uses "if…then…" statements, and I/O psychology uses ATIs), the notion that situations and traits interact to predict behavior has caught on. Mischel himself has even proposed a model that accounts for both individual and situational characteristics (CAPS; Mischel, 2009).

Perhaps one of the more recent and popular models of person by situation interactions is described by Tett and Guterman (2000). Tett and Guterman (2000) proposed trait activation theory as an update to the interactionist perspective of personality. Interactionist perspectives are not new and have had a large presence throughout personality research in psychology. Interactionist perspectives, such as trait-activation theory, are founded on the principle that personality traits require trait-relevant situations for their expression (Kenrick & Funder, 1988). To demonstrate this, researchers (e.g., Haaland & Christiansen, 2002; Tett & Burnett, 2003) often give the example of measuring aggression at a religious service or other social gatherings where aggression is inappropriate. That is, while individuals may differ in their aggressive propensities, most individuals are unlikely to act aggressive in these contexts.

The previous example highlights the importance of a situation's *trait relevance*. Scholars have long argued that situations affect individuals' trait-related behavior. Tett and his colleagues (e.g., Tett & Burnett, 2003; Tett & Guterman, 2000) use the term trait

relevance to describe the thematic connection between a situation and a trait. Tett and Guterman (2000) tested the effects of a situation's trait relevance effect on the relationship between self-report trait measures and trait-relevant behavioral intentions. They concluded that situational trait-relevance moderates this relationship, such that the correlation between trait-relevant behavioral intentions and self-report measures was stronger for trait-relevant situations.

Situations thus may exist along a continuum of trait relevance, from irrelevant (as with the example of measuring aggression at a religious service) to relevant (e.g., measuring aggression in a combat scenario). However, trait relevance is only one aspect of trait activation theory. It may be just as inappropriate to measure a trait in situations that do not allow for variation in this trait's expression. In the example provided above (measuring aggression in a combat scenario), differences in trait aggression will not be detected as all individuals (regardless of their "true" aggression) will respond in an aggressive manner. Tett and Burnett (2003) describe this as *situational strength* and argue that strong situations do not allow for variation in trait expression. In other words, strong situations may negate individual differences in responses as all individuals respond in a similar fashion. Thus, while a situation may be highly trait-relevant, it may not differentiate individuals on that trait effectively. Alternatively, w*eak situations* likely allow for greater variance in trait expression. This is similar to the notion that Brett and Atwater (2001) suggested wherein the 360 process was such a strong and evaluative context that most individuals were likely pursuing performance goals, regardless of their goal orientation.

The relationship between trait goal orientation and state goals may function in mechanisms similar to those described by Tett and his colleagues. Button et al. (1996) suggested that situations may be strong enough to evoke non-congruent goals and reduce interpersonal variance in goals. Strong situations that are relevant to performance will likely evoke performance goals in individuals while strong situations relevant to learning will likely evoke mastery goals (Button et al., 1996; Tett & Burnett, 2003). This notion has been applied to a range of psychology research, including assessment centers (Haaland & Christensen, 2002), and monitored training (Watson et al., 2013).

As is described above, goals represent desired end states that reflect an interaction between person and situation factors (DeShon & Gillespie, 2005). However, in strong and relevant contexts, situational factors may result in individuals pursuing a non-congruent goal and in less interpersonal goal variance. Because goals are primarily understood through their effects on interpreting and using feedback (Dweck & Leggett, 1998), it follows that strong situational contexts can ultimately drive later stages of self-regulation, such as feedback perceptions and usage. The critical role of feedback in self-regulation is described below.

The role of feedback in self-regulation. Feedback plays a central role in the self-regulatory process through affecting the goal striving and goal evaluation stages (DeShon & Gillespie, 2005; Ilies & Judge, 2005). Specifically, feedback allows an individual to identify the magnitude and direction of goal discrepancies (or error; DeShon & Gillespie, 2005). That is, feedback provides critical information about the individual's performance relative to their goals and the effectiveness of various task strategies in meeting these goals (Lam, DeRue, Karam, & Hollenbeck, 2011). More narrow views of feedback have

suggested that this mechanism is partially mediated by self-efficacy, such that feedback affects self-efficacy and that self-efficacy drives subsequent goal setting (Tolli & Schmidt, 2008).

As such, feedback is an essential part of the performance evaluation and training processes (London, 2003). In a review of feedback, London (2003) notes that feedback may be used to influence subsequent goal setting and to foster employee development. Since individuals will often overstate their own competence or performance quality (Kruger & Dunning, 1999; London, 2003), performance feedback can ground employees to the reality of their performance. However, this discrepancy between an employee's anticipated performance and subsequent performance evaluations may lead to denying of, minimizing the importance of, or disregarding of feedback (Keeping & Levy, 2000; Kruger & Dunning, 1999). As such, simply providing an individual with feedback does not ensure behavioral change, as individuals may deny or ignore this feedback based on how it is perceived. The role and importance of feedback perceptions in the feedback delivery process is described below.

Feedback perceptions. When receiving feedback, individuals cognitively and affectively evaluate and react to performance information (Brett & Atwater, 2001; Keeping & Levy, 2000). These perceptions can in turn affect behavioral intentions, acceptance of feedback, and ultimate behavioral change (Taylor, Fisher, & Ilgen, 1984). Within the context of performance appraisals, researchers have recently noted that appraisal effectiveness is largely a function of employees' reactions to the appraisal process (Brown & Sitzmann, 2011; Keeping & Levy, 2000). For example, the extent to which feedback influences self-regulatory processes, such as self-efficacy, may be

moderated by the employee's attributions. Feedback is most likely to influence self-efficacy when performance information is internally attributed and least likely when it is externally attributed (i.e., attributed to the situation or the task; Tolli & Schmidt, 2008)

When examining the performance appraisal process as a whole, reactions may include satisfaction, fairness, accuracy, and utility (Keeping & Levy, 2000). In an examination of the structure of these reactions, Keeping and Levy (2000) found that reactions were hierarchically structured. Specifically, a higher order factor (appraisal effectiveness) was found to cause variation in lower order reactions (system satisfaction, session satisfaction, perceived utility, perceived accuracy, procedural justice, and distributive justice), such that the reactions represented distinct but related constructs. Similar models have been adopted within the training literature (e.g., Brown, 2001 notes that the training reactions of enjoyment, relevance, and satisfaction all relate to the higher order construct of training reactions) and for 360-evaluations (e.g., Brett & Atwater, 2001). Based on this literature, feedback perceptions are defined as satisfaction, fairness, accuracy, and utility perceptions

Satisfaction is the most often measured reaction to the performance appraisal process (Giles & Mossholder, 1990) and reflects the extent to which an individual is satisfied with the appraisal interview, with the appraisal system, or the performance ratings (Keeping & Levy, 2000). The parallels for these in the current context (training) would be satisfaction with the way in which feedback was delivered, with the data-collection system, and the feedback itself. Perceived fairness largely has its roots in organizational justice literature and was traditionally conceptualized as the perceived fairness of performance ratings or with the process as a whole (Keeping & Levy, 2000).

Subsequent definitions (e.g., Korsgaard & Roberson, 1995) have defined fairness at a more granular level, including perceived fairness of the ratings, system, procedural justice, and distributive justice. Perceived utility reflects the extent to which an individual feels that the information they have been provided is useful, however some have used it to define the usefulness of the system as a whole (Keeping & Levy, 2000). Finally, individuals make cognitive evaluations of the extent to which they feel their performance has been accurately evaluated (Brett & Atwater, 2001; Keeping & Levy, 2000). These cognitive evaluations are represented in perceived accuracy.

The above reactions (satisfaction, utility, fairness, and accuracy) may be affected by individual characteristics, such as goal pursuit (Bret & Atwater, 2001; VandeWalle et al., 2001). Initial reactions to feedback can influence whether employees use this feedback and ultimately change their behavior and may be affected by employees' goals (Smither, London, & Reilly, 2005). The relationship between feedback perceptions and behavioral change is described below.

Feedback perceptions and behavioral change. There is growing consensus that the overarching purpose of performance management and employee feedback should be performance improvement and behavioral change (Taylor et al., 1984). This foundation has led researchers to be increasingly interested in employees' perceptions and usage of feedback information. For example, Ilgen et al. (1979) outline a model in which feedback perceptions and psychological acceptance of feedback are key predictors of feedback usage and ultimate behavioral change. Similar models have emerged for multi-source feedback (e.g., Smither et al., 2005).

Ilgen et al.'s (1979) model suggests that individuals first and foremost make evaluations regarding feedback information (termed broadly as *perceived feedback*). Perceived feedback, Ilgen et al. (1979) continue, is a function of both person and stimulus. That is, feedback perceptions are affected by the actual characteristics of the feedback as well as individual characteristics (such as goal disposition). Evaluations of accuracy are a direct result of the way individuals perceive feedback and subsequently predict an individual's desire to respond to feedback (Ilgen et al., 1979). After setting a behavioral plan for acting upon feedback, whether or not individuals act upon feedback is ultimately a function of external constraints (i.e., the ability to act upon the feedback information). This model is summarized in Figure 2. The current study examines measurable subsections of this model, including individual differences (goal pursuit), feedback perceptions, acceptance, and responses.

These models share conceptual overlap with other popular psychological; theories. For example, Ajzen's theory of planned behavior (Ajzen, 1991) suggests that three factors (behavioral attitude, subjective norms, and perceived behavioral control) influence an individual's *intention* to change their behavior. The link between intentions and outcomes is in turn affected by the individual's locus of control, among other factors. A similar model applies here. Behavioral change (i.e., accepting feedback) is directly a function of an individual's intention to act upon feedback provided to them. Combined with the above arguments, this intention is largely a function of an individual's goal (with mastery goals linked to stronger behavioral intentions than performance goals). Within performance management, an individual's reactions to feedback can directly influence their intentions to change their behavior (Ilgen et al., 1979). As such, feedback reactions

influence an individual's readiness to change their behavior and those with positive reactions are more likely to change their behaviors than those with negative reactions.

Tolli and Schmidt (2008) highlighted the importance of internal attributions of feedback in the self-regulatory process. Specifically, they argued that feedback is only likely to result in behavioral or attitudinal changes when it is accepted by the employee. Similar notions have carried through in subsequent literature on performance evaluation. For example, Brown and Sitzmann (2011) suggest that individuals that have positive feedback perceptions are more likely to use this feedback and ultimately benefit from the process.

Smither et al. (2005) demonstrated that feedback does not change the behaviors of all employees. As a result, they proposed a model in which feedback reactions are situated as key mediators for the relationship between feedback and behavioral change. Specifically, Smither et al. (2005) suggest that performance improvement following multi-source feedback is a result of the individual using this feedback. According to their model, feedback usage is in turn affected by initial reactions to the feedback and subsequent goal setting. Directly tying into the current study, they also hypothesized that *feedback orientation* and personality traits would influence reactions to the feedback (akin to Hypothesis 2). In fact, Smither et al. (2005) found that feedback was more likely to result in behavioral change when it was used for developmental purposes (a result, they hypothesize, of subsequent goal states).

Classical meta-analytic evidence provided by Kluger and DeNisi (1996) notes that feedback that threatens an individual's self-esteem is less likely than non-threatening feedback to result in behavioral change. This is described in Kluger and DeNisi's (1996)

feedback intervention theory. Again, the mechanism through which this relationship is described is directly tied to an individual's actual usage of the feedback. When individuals have negative reactions to feedback, they are less likely to use this information and feedback is less likely to have an effect on subsequent behavior (Kluger & DeNisi, 1996; Smither et al., 2005).

Further linking goal states into the self-regulatory process through examining feedback may benefit the development of goal state literature as a whole. Previously, the relationship between goal state and learning has remained somewhat inconsistent. In their meta-analysis of the nomological network of goal orientation, Payne et al. (2007) found a positive relationship between mastery goals and learning. However, they noted that these findings were only based on two studies and that there was an insufficient number of studies to examine the relationship between performance goals and learning. This may be because goals are at their core a framework for interpreting and utilizing feedback (DeShon & Gillespie, 2005; Dweck & Leggett, 1988). In situations where feedback is neither accessible nor presented (i.e., in most e-learning studies), the relationship between goal state learning should be dampened. However, when learners are provided with feedback, goals have an opportunity to influence subsequent learning through influencing learners' interpretation of feedback.

Chapter 3: Hypotheses

The current study draws upon self-regulatory theories to examine a new and emerging context: Monitored training. By drawing from research on goal setting and feedback perceptions, hypotheses may be made regarding the emergence of situationally-specific goals and the interplay between these goals and feedback perceptions. Specific hypotheses are detailed below.

Perceived Monitoring Purpose and Goal State

As described above, contextual factors may orient an individual towards either performance or mastery of a task. Although goal orientation may affect an individual's tendency to approach a task in a particular way (i.e., either mastery or performance orientation; VandeWalle et al., 2001), contextual factors may also influence how evaluative or developmental an individual perceives the situation and the goals they set (Button et al., 1996). This means that within a general performance context, individuals may be more likely to be oriented towards performance than mastery. On the other hand, a learning context, such as training, may orient individuals towards mastery (Button et al., 1996). This difference in context (i.e., either performance-focused or mastery-focused) is one of the main differences between EPM implemented for on-the-job performance and EPM implemented for training. However, EPM within training may be framed in such a way that it changes the otherwise mastery-oriented context towards one that is more performance oriented. As such, monitoring purpose may influence goal states through affecting individuals' perceptions of monitoring. This is elaborated upon below.

Goal orientation reflects an individual's tendency to approach tasks with either a mastery or performance focus (VandeWalle et al., 2001). In the absence of situational cues, an individual's goal within a particular situation is largely a function of their goal

orientation (Button et al., 1996). Subsequently, some situations may create a context in which noncongruent goals emerge. For example, all individuals may be more likely to pursue a performance goal in highly evaluative contexts, independent of their trait goal orientation (Smither et al., 2005). These situations would be described as being high on situational strength and relevance (Tett & Guterman, 2000). That is, evaluative contexts are more relevant to performance goals than mastery goals. Furthermore, the strength of the context (highly evaluative) implies that there would be less variation across individuals, such that the expression of a mastery goal would be least likely in this context.

As with all situations, EPM may be classified in terms of its strength and relevance. EPM likely creates a strong context in which particular behaviors are evaluated and re-enforced. For example, when EPM is used for evaluating performance, individuals are aware of this intent and may tailor their behaviors accordingly. By recording individuals' behaviors, those that would have otherwise been open to exploring new methods and perhaps encountering errors along the way may be less likely to do so since each error is logged (Stanton, 2000). Because EPM creates a strong situational context, adding EPM to the otherwise mastery-oriented context of learning may affect learners' perceptions of the training context and subsequent goal states (Button et al., 1996; DeShon & Gillespie, 2005). However, trait relevance must also be considered.

EPM may either be relevant towards either performance or mastery, depending on its perceived purpose (Wells et al., 2007). That is, the same monitoring technology may be used to provide learners with prompts intended to refocus their attention and create adaptive guidance, or to provide management with in-depth analyses regarding learners'

in-training behaviors. Each of these is relevant to its own aspect of achievement. Adaptive guidance and learning prompts may be more conductive to mastery and administrative monitoring may be more conductive to performance. As such, EPM represents a strong context that is either relevant to performance or mastery and an individual's perceptions of EPM's purpose should orient them either towards performance or mastery goals.

Initial research on EPM and in performance management supports this idea. For example, Wells et al. (2007) suggested that perceived EPM purpose can affect fairness, satisfaction, commitment, and obligation. Similarly, administrative performance management systems may result in employees that focus more on evaluative components of performance management than developmental components (Arvey & Murphy, 1998; DeNisi & Sonesh, 2011). Similar arguments have been made in the multi-source feedback literature. For example, Smither et al. (2005) suggest that feedback used to guide employee development creates a mastery orientation and subsequently improves performance while feedback used in evaluative purposes will result in a performance orientation.

Together, this suggests that the monitoring purpose can influence the goal-setting process through orienting an individual towards mastery or performance. Individuals that perceive monitoring as being highly evaluative may be more oriented towards performance goals, even when controlling for their trait goal orientation. Similarly, individuals that perceive monitoring as being highly developmental may be more oriented towards mastery goals, even when controlling for their trait goal orientation. As

a result of the situational strength of EPM, there may subsequently be less variance in goals under EPM. Thus, I hypothesize:

Hypothesis 1: Monitoring purpose will influence goal states, when controlling for state goal orientation, such that:

Hypothesis 1a: Individuals being monitored for developmental purposes will perceive the monitoring system as being more developmentally-focused and have higher levels of mastery-focused goals

Hypothesis 1b: Individuals being monitored for administrative purposes will perceive the monitoring system as being more performance-focused and have higher levels of performance-focused goals

Hypothesis 1c: The control group will have more variance in goals than either monitored condition

Goal State and Feedback Perceptions

Goals shape employees' reactions to and perceptions of feedback (Dweck & Leggett, 1988; Stevens & Gist, 1997). This may be due to the effect of goal pursuit on attentional focus and attributions. When individuals are geared toward evaluation or performance, they are more likely to perceive feedback as threatening and representative of their personal ability. However, when oriented toward development, individuals may perceive this same feedback as less self-threatening and as a developmental opportunity (Kluger & DeNisi, 1996).

Monitored training may ultimately provide learners with feedback regarding the information collected. When provided with this feedback, trainees may form immediate perceptions of the feedback that are a function of both person and situation components. Ilgen et al.'s (1979) model of feedback integration suggests that feedback perceptions,

including satisfaction, fairness, accuracy, and utility perceptions, may be affected by an individual's goals. In many ways, Ilgen et al.'s (1979) model is integrated into the self-regulatory processes described by DeShon and Gillespie (2005). In this sense, feedback serves the purpose of identifying goal discrepancies that are essential to directing subsequent effort. However, Ilgen et al.'s (1979) model suggests that feedback is not an objective characteristic. Instead, it is a subjective evaluation that is a function of objective characteristics (the actual discrepancy level) and individual characteristics (goal pursuit). Given standardized feedback, then, feedback perceptions should largely be a function of patterns of activated goals (Dweck & Leggett, 1988; Ilgen et al., 1979; Kluger & DeNisi, 1996; VandeWalle et al., 2001).

As described above and in the previous chapter, the relationship between goal pursuit and feedback perceptions is well established, with Dweck and Leggett's (1988) research serving as the foundation for an entire subsequent body of literature (e.g., Brett & Atwater, 2001; DeShon & Gillespie, 2005; Kluger & DeNisi, 1996; VandeWalle et al., 2001). However, little research has been conducted to extend this evidence to electronic delivery of feedback. In the research described above, performance information is often collected by a supervisor or coworker and delivered in face-to-face reviews. Electronic monitoring alters this process through collecting and delivering performance data automatically (Stanton, 2000). This automatic process differs psychologically from the traditional context in a few systematic ways. First, electronic monitoring may occur continuously, whereas a supervisor is unable to continuously watch one trainee. Second, it is not always clear what information electronic monitoring is capturing. That is, trainees are unsure what aspects of their performance are being captured by the

monitoring technology and how this information is being used to generate feedback or evaluations. Third, electronic monitoring is able to capture information objectively and report it to the trainee, whereas employees may otherwise be aware of biases and the subjective nature of traditional evaluations. Fourth, the actual objectivity of the information collected may influence the relationship between goals and feedback perceptions. Since information collected and presented from EPM is in fact more accurate (as opposed to subject to individual biases; Stanton, 2000), it is possible that individuals simply do not form accuracy or fairness perceptions. This notion will be tested in the current study prior to analyzing the dimensionality of feedback perceptions.

As such, a few studies have examined differences between EPM and traditionally-delivered feedback. For example, Earley (1988) found that employees had higher trust in feedback that was generated electronically than feedback that was delivered by supervisors. This may be due to employees perceiving more control over electronic feedback, since it removes some element of subjectivity (Stanton, 2000). Elsewhere, Chalykoff and Kochan (1989) suggested that EPM may in fact enhance job attitudes, such as job satisfaction. Because EPM occurs frequently, it is more able to capture relevant performance information than supervisors that capture infrequent or second hand performance information. However, EPM may be associated with increased anxiety and potentially follow patterns of social facilitation and inhibition (Aiello & Kolb, 1995; Aiello & Svec, 1993; Stanton, 2000).

Stanton's (2000) framework for EPM has provided a framework for subsequent monitoring literature. A key component of Stanton's (2000) model is that monitoring characteristics, such as its purpose, may influence monitoring cognitions and feedback

perceptions. This study uses established self-regulation research to elaborate on this relationship. Specifically, the mechanism through which monitoring characteristics influence feedback reactions is through influencing employees' goals. Goals, in turn, are a key factor in the feedback perception process.

Thus, the current study extends the well-researched notion that goals influence feedback perceptions to a new domain: Electronic collection and delivery. However, given the substantial body of evidence to support this research in traditional context (including meta-analytic evidence), there is reason to believe that goals should indeed shape feedback perceptions in an electronic environment as well. As such I hypothesize that:

Hypothesis 2: Goal state will affect learners' feedback perceptions, such that:

Hypothesis 2a: Mastery goals will positively predict feedback perceptions

Hypothesis 2b: Performance goals will negatively predict feedback perceptions

Feedback Perceptions and Behavioral Change

Feedback usage is central to the feedback intervention process (Kluger & DeNisi, 1996; Smither et al., 2005). That is, behavioral change is most likely when individuals accept the feedback that is given to them. Based on Ajzen's (1991) classic theory of planned behavior, individuals form behavioral intentions that drive subsequent actions. When an individual perceives the ability to change their behavior, these intentions will likely turn to action. In the current context, behavioral change (i.e., accepting and using feedback) is directly a function of an individual's intention to act upon the feedback provided. In order for feedback to influence subsequent behavior, employees must internalize this feedback and perceive the ability to change their behavior (Smither et al., 2005).

Kanar and Bell (2013) more recently indirectly demonstrated this in the context of monitored training. Kanar and Bell (2013) sought to examine characteristics of feedback that were most beneficial to subsequent performance improvements in an adaptive guidance training. They examined two forms of feedback: autonomy-supportive and controlling and found that, contrary to theoretical hypotheses, controlling feedback (framed as you "you should") was more likely to result in subsequent performance improvements than autonomy-supportive feedback (framed as "you might consider"). Taken in the context of the above discussion, a key missing mediator (feedback usage), may be the reason for this difference. That is, individuals receiving controlling feedback may have been more likely to actually use this information, since it may have been perceived as more mandatory than the autonomy-supportive feedback. As such, their examination has little to do with the theoretical implications discussed (the role of supporting vs. restricting autonomy) and may be more adequately explained by noting that individuals are more likely to use feedback they feel is mandatory and feedback usage was related to learning.

At its core, monitored training parallels performance management and there is reason to suspect similarities in psychological processes related to feedback across the two contexts. That is, monitored training is used to collect information regarding trainee performance for either administrative or developmental reasons. This bears striking similarities to performance management, or the systematic evaluation of employees conducted for developing, describing, and evaluating performance (Wildman, Bedwell, Salas, & Smith-Jentsch, 2011). Both involve collecting information regarding employee performance (either on-the-job or during training) for either the purpose of evaluation or

developmental purposes. Furthermore, employee acceptance and usage of feedback is critical to both performance management success (DeNisi & Sonesh, 2011) and training success (e.g., Kanar & Bell, 2013). Given the similarities between the two and the importance of feedback usage on the relationship between reactions and subsequent performance, I hypothesize:

Hypothesis 3: Feedback perceptions will indirectly affect learning, such that:

Hypothesis 3a: Feedback perceptions are positively related to feedback usage

Hypothesis 3b: Feedback usage is positively related to learning

Summary

To review, the current study combines emerging research on monitored training (e.g., Kanar & Bell, 2013; Watson et al., 2013) with extant research on electronic monitoring (e.g., Wells et al., 2007), and feedback (e.g., Ilgen et al., 1979) to understand how monitoring purpose affects self-regulatory processes. Based on this integration, goal state is posited as a key mediator in the relationship between monitoring purpose and training outcomes (feedback acceptance and learning). A process model is proposed, such that administrative monitoring results in increased pursuit of performance goals, more negative feedback perceptions, decreased feedback usage, and decreased learning and that developmental monitoring results in increased pursuit of mastery goals, more positive feedback perceptions, increased feedback usage, and increased learning. An indirect effect is hypothesized between feedback perceptions and learning, such that the relationship between feedback perceptions and learning can be primarily attributed to the role of feedback usage. A proposed model that summarizes these relationships is presented in Figure 2.

Chapter 4: Method

Design

Given the emergence of Internet-based training in organizations (Brown & Sitzmann, 2011), this study was conducted online. Since Internet-based testing allows learners to complete training at a time and location of their choice, learners had one week from signup to complete the study at a time and location of their choice.

This study's primary interest is in the relationship between monitoring purpose and training outcomes. In order to examine this, this study used a 3 condition (non-monitored vs. administrative vs. developmental) between-subjects experimental design.

Manipulation. Participants were randomly assigned to one of three conditions: A non-monitored condition, a monitored condition with an administrative purpose, and a monitored condition with a developmental purpose. Monitoring for this study included tracking learners' clicks and time spent per page during training. In order to collect full behavioral data from all conditions, all participants were in fact monitored. As such, deceit was used in the non-monitored condition in order to lead learners to believe that this information was not being collected. The experimental manipulation consisted of the following text:

Non-monitored condition.

> "The following training program will cover information necessary to learn about basic functions in Microsoft Excel. The navigational tools provided will allow you to pause, fast forward, rewind, or skip material as you'd like. After completing the videos, you will be provided with feedback and suggestions.

Below, you will see whether automatic monitoring has been turned on or off. If monitoring is on, the software will track your behaviors throughout training. If monitoring is off, this information will not be tracked or recorded. Please click below to acknowledge that monitoring has been turned off."

Monitored: administrative

"The following training program will cover information necessary to learn about basic functions in Microsoft Excel. The navigational tools provided will allow you to pause, fast forward, rewind, or skip material as you'd like. After completing the videos, you will be provided with feedback and suggestions.

Below, you will see whether automatic monitoring has been turned on or off. If monitoring is on, the software will track your behaviors throughout training. Information collected (on how long you spent per video, engagement, attention focus, and number of videos watched) will be used for **tracking and evaluating your performance during this HIT.**[1] **The researchers may have access to this information when determining whether you have fully completed the HIT.** A sample completion report is provided below. Please click below to verify that monitoring has been turned on."

Monitored: Developmental

[1] HIT refers to a Mechanical Turk Human Intelligence Task. Further information on Mechanical Turk is provided in the following section.

> "The following training program will cover information necessary to learn about basic functions in Microsoft Excel. The navigational tools provided will allow you to pause, fast forward, rewind, or skip material as you'd like. After completing the videos, you will be provided with feedback and suggestions.
>
> Below, you will see whether automatic monitoring has been turned on or off. If monitoring is on, the software will track your behaviors throughout training. Information collected (on how long you spent per video, engagement, attention focus, and number of videos watched) will be used for **providing you with suggestions for maximizing how much you learn from the videos.** Although the researchers will also have access to this information, **this information is purely for your own use and will have no bearing on whether you have met the requirements for this HIT**. A sample completion report is provided below. Please click below to acknowledge that monitoring has been turned on."

Learners were presented with a sample completion report that could be generated from the online monitoring. This is similar to the approached used by Watson et al. (2013) to increase the credibility of the monitoring manipulation and inform users of the type of information that could be reported or created. This is presented in Appendix A.

Finally, the top of each video displayed the condition learners have been assigned to (i.e., "Monitoring is On" or "Monitoring is Off") in order to ensure that monitoring remained salient throughout the training.

Participants

This study's population of interest is working-age adults within the United States. Based on the above hypotheses, a subsample of 500 individuals from this population was desired. A total of 1,094 participants were recruited from Amazon's Mechanical Turk (MTurk). Mechanical Turk is an online market place that allows researchers and individuals to post tasks (or Human Intelligence Tasks, HITs) for workers to complete in exchange for monetary compensation. MTurk was chosen for the current context since its population tends to be more diverse than traditional undergraduate research pools and may more adequately sample from the population of interest (working-age adults within the United States; Behrend, Sharek, Meade, & Wiebe, 2011). MTurk has become an increasingly attractive method of data collection within psychology research due to this increased diversity at no detriment to data quality (Behrend et al., 2011; Buhrmester, Kwang, & Gosling, 2011; Paolacci, Chandler, & Ipeirotis, 2010) and increased ability to filter participants at multiple stages of the research process (Karim et al., 2014). Despite MTurk originally being a crowdsourcing board, participants from MTurk are more likely to be driven by self-development and thus oriented towards mastery than other participants (e.g., undergraduate samples, Behrend et al., 2011; Cavanaugh, Callan, & Landers, 2014).

Data filtering

Participants were screened based on their location (U.S. only permitted), quality (pervious HIT approval rate of at least 95%), and age (18-65). Participants were filtered by location and age in order to ensure generalizability to the population of interest (working age Americans.) Participants were screened based on their approval rating to increase data quality. Participants with low approval ratings may have failed to complete

previous tasks to researchers' standards. In order to ensure high-quality data, those with less than a 95% approval rating were not be permitted to complete the study.

These filters were completed using MTurk's built-in filters and verified at the beginning of the survey (i.e., participants will also be asked to provide their age and location. Those who responded outside the range of acceptable answers were not permitted to complete the study). Participants who passed MTurk's filter (i.e., had their account registered within the US, had an approval rating of at least 95%, and were of the ages 18-65) but fail the secondary screening were removed prior to beginning the study. Participants were also filtered post-data-collection based on data quality checks (e.g., "if you are paying attention, please respond 'strongly disagree' to this question) and other data quality checks. Similar measures have been suggested when conducting research on MTurk. For example, Paolacci et al. (2010) recommend adding items that typically would lack variance. For example, "While watching the television, have you ever had a fatal heart attack?" Participants that were not paying attention may have responded in the affirmative to this question.

Demographics

Basic demographic data (age, gender, race/ethnicity, education, and employment status) were collected at the end of the study to ensure that the sample is indeed representative of the intended population. Participants were primarily white (77%) and female (63%). Smaller proportions of participants were Black (9%), Hispanic (5%), Asian (4%), and other/multi-racial (5%). All participants had completed at least a high school degree, with 27% having completed a 2-year college or associate's degree, 34% having completed a 4-year college or Bachelor's degree, and 15% having earned a

master's degree or higher. The majority of participants were employed at least part-time (71%).

Procedure

Upon providing their informed consent to participation, participants were randomly assigned to the non-monitored, monitored (administrative), or monitored (developmental) condition. Participants were unaware of the other conditions. So as to capture the situational specificity of goals, participants completed the state goal measure immediately following random assignment. Following this, learners completed the training program. Following each training module, learners completed a declarative knowledge check (framed as an opportunity to "Test Yourself" for learners). After training, learners received feedback on their performance, had the opportunity to revisit any module they would like, and then completed a post-training skills test.

Training Program

The training program used in the current study was a 12 minute Microsoft Excel training program that covered the use of "vlookup" functions, which is a common and useful method for manipulating data within Excel for organizations. These videos were created and distributed by Microsoft for individuals to learn common Excel functions. This content area was chosen because of its likely usefulness and application beyond the scope of the study, providing trainees with motivation beyond monetary incentives for learning the material. Furthermore, given the ubiquity of Excel and similar products in the modern workforce, the study presents a realistic condition for organizational training.

The training program was broken into four separate modules and embedded into the survey software itself (as opposed to Microsoft's website). Doing so presents a number of benefits. First, this increased the credibility of the manipulation. That is, it is

unlikely that the researchers would be able to monitor trainees' progress throughout the training program if the content is hosted on an official Microsoft website. By moving the content to a website created by the researcher, it becomes plausible that the survey has tracking capabilities (which is indeed the case). Second, the survey software used allowed for very low levels of monitoring to take place. Specifically, the survey was able to capture the amount of time spent on each module, present this information back to learners (if they are in one of the two monitored conditions), and capture whether learners used the feedback that is provided. Thus, re-hosting the training within the survey software allowed for a more credible manipulation and more behavioral measures to be captured. A screenshot of the re-hosted training (including a monitoring reminder) is presented in Appendix A.

After each module, learners were presented with a "knowledge check" in the form of three declarative knowledge items that covered the range of information covered in the module. These 12 total items (three per module) were automatically scored by the survey software. Learners received the score and detailed feedback (regardless of condition) following completion of all training modules. This served as the primary form of feedback for learners.

Post-Training

After completing training, learners were directed to the post-training section of the survey. Learners were provided with feedback on their performance during the declarative knowledge checks. They then rated their perceptions and subjective acceptance of this feedback and had the opportunity to re-watch any video they would like. Finally, learners completed a post-training skills test (assessing learning).

At the completion of the training program, learners were provided with a completion report. For all learners, the completion report included their declarative knowledge score (per module), the recommended amount of time for that module, and a prompt that they should revisit this module. For those that were randomly assigned to one of the two monitored conditions, the completion report also detailed the amount of time they spent on each module. An example completion report is presented in the Appendix B.

Using this information, learners provided their perceptions and acceptance of feedback and indicated which modules they would like to revisit, if any. Clicking the link for that module launched the training section in a new window, allowing the survey to remain active and capturing how long learners spent reviewing material. This method also allowed for an objective measure of whether or not learners intended to use feedback that was provided to them**.**

A measure of feedback acceptance was created post data collection. The survey presented all learners with feedback on their declarative knowledge checks. Learners then had the opportunity to revisit any section they wish after receiving this feedback and before proceeding to the final skills test. Learners were then prompted/suggested to revisit any module where they did not score a perfect score on the post-training declarative knowledge check. Behavioral feedback acceptance was defined as the number of modules revisited over the number of modules suggested for revisit.

After learners returned to the survey after revisiting content or after learners decided not to accept the feedback, learners completed the post-training questionnaire. The post-training questionnaire included learning and demographics. Learning

conceptualized as including cognitive and skill-based learning. Feedback perceptions were based on Keeping and Levy's (2000) model of performance appraisal reactions.

Scale Development

A scale development process was undertaken to develop the monitoring purpose scales and to test a number of crucial elements of the current study, such as the credibility of the manipulation, accuracy of survey skip-logic, difficulty and relevance of learning measures, and time of the full study. Items for the perceived monitoring scale were assessed for their relevance and clarity. Based on this, additional items were written for this scale to bring this scale more in line with monitoring's conceptualization and operationalization.

Measures

Manipulation check. Learners were asked to indicate, from 0% to 100%, the probability that their behaviors during training were monitored.

Perceived purpose. The perceived purpose of monitoring was measured using an adapted version of Wells et al.'s (2007) scale in combination with items written for the current study. The measure was comprised of two subscales: perceived developmental purpose (e.g., "The monitoring system was used to help me learn better.") and perceived administrative purpose (e.g., "The monitoring system was used to help prevent wrongdoing on the part of Mechanical Turk workers"). Perceived developmental purpose was measured using a five-item scale (α=.94) and perceived administrative purpose was measured using a four-item scale (α=.90). The process used to develop these items is detailed in the results section.

Goal orientation. Goal orientation was measured using VandeWalle's (1997) 12-item goal orientation measure assessing performance-prove (α=.87), performance-avoid

(α=.88), and mastery orientation (α=.89; 4 items each). Scale items were measured on a 6-point Likert scale, ranging from 1 (strongly disagree) to 6 (strongly agree). For example, "I often look for opportunities to develop new skills and knowledge" (mastery).

Goal state. Goal state was measured using Bell and Kozlowski's (2008) measure of state goals that covers mastery and performance goals. For example, "On this task, I would like to avoid situations where I might demonstrate poor performance to myself" (performance-avoid), and, "The opportunity to learn new things about this task is important to me" (mastery). The dimensionality of this scale was tested (results in the following section) and item statistics were examined. Results suggested a three-factor solution measuring performance-prove (α=.83), performance-avoid (α=.85), and mastery (α=.89) state goals (each measured using four items).

Feedback perceptions. Keeping and Levy's (2000) model of feedback perceptions was used to inform the measurement of feedback perceptions. Specifically, Keeping and Levy (2000) suggest that lower-level constructs such as feedback satisfaction, perceived utility, perceived accuracy, and perceived justice are all related to the higher-order construct of feedback perceptions. Therefore, although the current study made hypotheses regarding feedback perceptions as an overarching construct, hypothesis testing will be done on these lower-order constructs. Specifically, feedback perceptions were measured using five subscales, measuring trainees' satisfaction with the feedback, perceived utility of the feedback, perceived accuracy of the feedback, procedural justice perceptions, and distributive justice perceptions. Satisfaction with feedback was measured using Greller's (1978) three-item measure (e.g., "I am satisfied with the feedback"). Perceived utility of the feedback was measured using Greller's (1978) four-

item measure (e.g., “The feedback helped me understand how I can learn the material better”). Perceived accuracy of the feedback was measured using Stone, Gueutal, and Mcintosh’s (1984) nine-item scale (e.g., “I believe the feedback was correct”). Procedural justice perceptions were measured using Keeping, Makiney, Levy, Moon, and Gillette’s (1999) three-item scale (e.g., “The procedures used to generate the feedback were fair”). Distributive justice perceptions was measured based on Korsgaard and Roberson’s (1995) four-item scale (e.g., “The feedback fairly represented my performance on the task”). All feedback perceptions measures were modified slightly to refer to the feedback delivered within the current context. The dimensionality of these measures (including whether subjective acceptance can be conceptualized as a feedback perception) was tested prior to modeling. Full results are presented in the following section. Results suggested a two-factor solution measuring fairness perceptions (9 items, α=.84) and utility perceptions (4 items, α=.89)

Feedback acceptance. Behavioral feedback acceptance was assessed using a behavioral measure. Specifically, behavioral feedback acceptance was calculated as the number of modules an individual chose to revisit following the engagement index. All learners were allowed, and encouraged, to revisit all modules. This data was collected automatically through the survey software immediately after learners received feedback but before they chose whether or not they act upon this feedback.

Learning. Cognitive and skill-based learning were assessed. Cognitive learning was calculated using a 6-item declarative knowledge test created by Microsoft specifically for this training (m=4.3, sd=1.2). Skill-based learning was assessed by providing learners with a task to be completed post-training. An Excel sheet was

embedded into the survey that allowed learners to view, but not type into, a multi-tab spreadsheet. Learners assumed the role of an HR manager who needed to use the Vlookup function in order to match employee names to their positions, positions to hourly wages, and names to timesheets. Learners were asked to provide three separate functions (match names to positions, match positions to hourly wages, and match names to hours worked). This test spanned the range of information covered during all four training videos and allowed for partial credit. For example, learners that used the correct formula but forgot to properly use the $ sign to allow the formula to be copied received partial credit. The skills test is presented in Appendix C. Responses were coded independently by three coders. Interrater reliability was assessed using ICCs. Results suggested sufficiently high reliability for the three open-ended questions (ICC=.99, .99, and .98). A total of 8 points were possible per question (Q1: m=4.3, SD=2.8; Q2: m=4.0, SD=2.7; Q3: m=3.6, SD=2.5). The overall average for the open-ended skills test was 10.9/24 (SD=7.7).

Demographics. Following completion of the survey, participants were asked to provide basic demographics (i.e., age, gender, race/ethnicity, employment status, and educational level).

Analysis Plan

The model presented in Figure 1 was tested in multiple steps. First, the hypothesis that perceived purpose will differ across conditions was tested using an ANOVA. Specifically, it was hypothesized that individuals in the developmental-monitored condition would have higher developmental perceptions than those in the administrative and control groups, and that those in the administrative-monitored condition would have higher administrative perceptions than those in the developmental and control groups.

The hypothesis that goal state variance will differ across conditions was tested using an *F-test* of equality of variances. Specifically, it was tested whether there was less variance in performance goals in the administrative condition compared to the control condition and whether there was less variance in mastery goals in the developmental condition compared to the control condition.

The remainder of the model was tested using a structural equation model (SEM). Specifically, perceived developmental monitoring and perceived administrative monitoring were modeled as exogenous variables. Goal state, feedback perceptions, feedback acceptance, and learning were modeled as endogenous variables. The model was tested in Mpus Version 7 (Muthén & Muthén, 2012).

Chapter 5: Results

All data were entered into Stata version 13.1. Stata was used for data management, scale reliability indices, factor analyses, and all other tests not related to the structural equation model. The structural equation model, including the measurement model, was tested in mPlus Verion 7.

Data filtering

A total of 1,094 participants accepted the HIT. Although this is markedly higher than the desired sample and the final sample, this includes all participants who accepted the HIT regardless of the number of questions answered. Observations were filtered based on two criteria. First, participants who failed at least one of the two attention checks were removed from the sample. This resulted in 140 observations being removed from analysis for responding to the attention checks incorrectly and 491 observations being removed from analysis for failing to respond to the attention checks. The majority (83%) of participants who did not respond to the attention checks did not complete the study and thus can be classified as non-respondents. Post-random assignment dropout rates were examined, where dropout was defined as a participant having a missing response for a variable which was automatically generated to 1 if the participant completed the training. About 20% of those who were not monitored, 25% of those in the evaluative monitoring condition, and 24% of those in the developmental monitoring condition withdrew post random-assignment. An ANOVA suggested that dropout rates did not differ by condition ($F(2,928)=1.23$, $p=.29$). Next, IP addresses were analyzed to determine repeat respondents. Only the first occurrence of each IP address was allowed. This resulted in a total of 3 observations being removed from analysis. Although additional repeat respondents were found (a total of 71), the majority of these

observations did not respond to the attention checks and were thus filtered out in a previous step. Therefore, the final usable sample included 518 respondents. Again, this large discrepancy is primarily a result of missing data from participants that viewed the study but did not ultimately complete it.

Preliminary Analyses

A number of preliminary analyses were conducted to inform the proposed structural model. Specifically, the factor structure of perceived monitoring purpose, state goals, and feedback perceptions was tested. Additionally, item statistics were examined for perceived monitoring purpose since many of these items were written for the current study. Results suggest a two-factor solution for perceived monitoring purpose (developmental and administrative), a three-factor solution for state goals (performance-approach, performance-avoid, and mastery), and a two-factor solution for feedback perceptions. Each of these is detailed below.

Perceived monitoring purpose. First, the factor structure for perceived monitoring purpose was examined. An exploratory factor analysis (iterated principal factor) with a promax rotation was conducted on the 15 items used to measure perceived monitoring purpose. Item statistics, Eigen values, and the proportion of variance explained by each factor was examined. Additionally, a parallel analysis was conducted using the user-generated *fapara* package in Stata. The *fapara* package conducts a parallel analysis by creating a random dataset based on random sampling from the original dataset. A factor analysis is conducted on the correlation matrix produced from this dataset and the number of factors retained is determined by comparing the eigen values between the two sets of results. Specifically, factor solutions are only retained if the eigen

value from original data is greater than the Eigen value generated from the parallel analysis. Additionally, the *fapara* package graphically depicts this by overlaying the Eigen values generated from the parallel analysis on top of those generated from the original data. Ten replications were conducted for the parallel analysis. Results support a two-factor solution that explained 93% of the shared variance in the set of items. Item statistics are presented in Table 1. Uniqueness reflects the percentage of variance in the item that is not shared among the set of items (i.e., uniqueness is 1-communality). Items with a high uniqueness (>.6) and high cross-loading (>.3) were removed. Factor loadings less than .25 are suppressed in the Table.

State goals. Next, the factor structure of state goals was tested. There is a general lack of consensus regarding the dimensionality of state goals. Although the current study proposed a simplistic model of performance and mastery goals, other models have suggested up to four dimensions (e.g., Elliot & McGregor, 2001). Further, most of these models are based on the trait aspect of goals and the dimensionality of state goals has generally not been examined. An exploratory factor analysis (iterated principal factor) was conducted on the 12 state-goal items. After examining the eigen values, the proportion of variance explained for each factor, and the parallel analysis, a three-factor solution was chosen that explained 83.7% of the shared variance in the set of items. The resulting factors aligned with the three-factor model used by VandeWalle and Cummings (1997), including mastery, performance-prove, and performance-avoid. All items had sufficiently high communalities and factor loadings. These items are detailed in Table 2.

Feedback perceptions. The dimensionality of feedback perceptions was tested using an iterated principal factors factor analysis with a promax rotation. Prior to this, the

relevance and appropriateness of each feedback perception was assessed. This was done by examining the percentage of participants that stated that a particular item did not apply to the current context. No item measuring acceptance, utility, or satisfaction had more than 1% of participants indicating that the item did not apply to the current context. The items measuring justice, however, did have a marginal percentage of respondents who felt that the items did not apply (all items had at least 1%, but no more than 3%, indicating that the item did not apply). Additionally, the distribution and variance of each item was examined. Because all items had a sufficiently low percentage of respondents who stated that the item did not apply and exhibited acceptable variance, all items were retained and entered into the factor analysis. Data were recoded to missing for participants who stated that the item did not apply, so as to not confound the results of the factor analysis.

After examining the Eigen values, the proportion of variance explained for each factor, and the parallel analysis, a two-factor solution was chosen that explained 88.3% of the shared variance in the final set of items. Specifically, acceptance and justice (procedural and distributive) loaded highly onto the same factor while utility perceptions loaded onto a separate factor. The three items measuring satisfaction were removed due to high uniqueness and cross-loading. A three-factor solution resulted in satisfaction loading onto its own factor but with two of the three items having high cross-loadings on other factors. Therefore, the two-factor solution was deemed more acceptable and used in subsequent analyses. Each item's loading and uniqueness is listed in the table below. Factor 1 generally represents fairness perceptions and factor 2 generally represents utility perceptions. Factor loadings are displayed in Table 3.

Manipulation checks. Participants in each group were asked to rate the likelihood that they were monitored during training (from 0% to 100%). A one-way ANOVA suggests that the manipulation did have the intended effect of making participants feel that they were being monitored ($F(2,503)=18.71$, $p<.01$). On average, participants in the administrative and developmental conditions were 65% confident that their actions were being monitored during training. Participants in the non-monitored condition were largely unsure if their progress was being monitored (47% likelihood on average) despite being informed that their progress was not being monitored.[2]

A multivariate analysis of variance suggested that perceived monitoring purpose differed across condition ($F(4,1028)=115.32$, $p<.01$). Post-hoc univariate tests suggest that participants in the administrative monitoring condition had higher administrative perceptions than participants who were not monitored ($t=14.26$, $p<.01$) and that participants in the developmental condition had higher developmental perceptions than participants who were not monitored ($t=15,7$, $p<.01$). Overall, monitoring condition explained 30% of the variance in administrative perceptions and 34% of the variance in developmental perceptions. Therefore, it is concluded that administrative and developmental perceptions were higher in their respective conditions and that the monitoring manipulation had the intended effect.

Measurement Model

[2] No participants were dropped based on their response to the monitoring likelihood question since this uncertainty reflects the reality of implementing monitoring and therefore is relevant to the question at hand. For informative purposes, hypotheses were tested with only those who "passed" this item. Removal of these participants did not meaningfully affect the study's results or conclusions.

Means, standard deviations, and correlations between study variables are presented in Table 4. Affective knowledge was dropped prior to analysis, due to poor item loadings likely stemming from a high number of reverse-coded items.

The measurement model underlying Figure 1 was tested using mPlus version 7. An initial test suggested marginal fit for the proposed model (χ^2=2015.6, *df*=944, *p*<.01; RMSEA=.05, CFI=.94, SRMR=.04). An examination of the modification indices generated from this test suggested the addition of three sets of correlated error terms (two perceived developmental monitoring items, two perceived justice items, and two reverse-coded acceptance items.)[3] Other modifications to the proposed measurement model were examined but did not result in meaningful changes to the model's fit. Because these changes did not have a meaningful impact on the interpretation of the model and resulted in a marginal increase in fit, they were added. After accounting for these correlated error terms, model fit increased to more acceptable levels (χ^2=1,649.4, *df*=941, *p*<.01; RMSEA=.04, CFI=.96, SRMR=.04). Therefore, the model with the added correlated error terms was used for the subsequent structural equation model.

Structural Equation Model Results

The full structural model demonstrated marginal to poor fit for the proposed model (χ^2=2,321.7, *df*=1,091, *p*<.01; RMSEA=.05, CFI=.93, SRMR=.09). Again, modification indices were examined to determine potential increases in model fit. Modification indices suggested the addition of covariance between utility and fairness perceptions and among all state goals. Alternative models were tested (e.g., dropping or adding paths), but no theoretically-justifiable modifications could be found that resulted

[3] Paths suggested by modification indices were added in an iterative process, adding the path with the highest expected impact and then running the model.

in strong increases in model fit. Because the addition of covariance increased model fit and did not change the interpretation of many paths, the above modifications were made. The adjusted model exhibited better fit (χ^2=1,935.5, *df*=1,087, *p*<.01; RMSEA=.04, CFI=.95, SRMR=.05). This adjusted model was used for hypothesis testing.

Hypothesis 1. Hypothesis 1 suggested that monitoring purpose would influence goal states when controlling for goal orientation. Specifically, Hypothesis 1a stated that the perceived developmental nature of monitoring would predict state mastery goals. This hypothesis was not supported (β=-.03, *p*=.5). Hypothesis 1b stated that the perceived administrative nature of monitoring would predict state performance goals. The perceived administrative nature of monitoring did not predict state performance-avoid goals (β=.05, *p*=.31) when controlling for trait goal orientation. However, perceived administrative nature of monitoring did significantly predict state performance-prove goals when controlling for trait goal orientation (β=.14, *p*<.01). Therefore, results provide partial support for Hypothesis 1b in that perceptions of administrative monitoring were independently and positively related to state performance-prove goals.

Hypothesis 1c suggested that there would be greater variance in state goals for the non-monitored condition. No support was found for this hypothesis.

Hypothesis 2. Hypothesis 2 suggested that state goals would influence learners' feedback perceptions, such that mastery goals would positively predict feedback perceptions (Hypothesis 2a) and performance goals would negatively predict feedback perceptions (Hypothesis 2b). Results suggest that neither state mastery goals (β=.07, *p*=.22) nor state performance-prove goals (β=.10, *p*=.10) significantly predicted fairness perceptions. State performance-avoid goals did significantly predict fairness perceptions

(β=-.19, p<.01). Utility perceptions, on the other hand, were significantly and positively related to state mastery goals (β=.15, p=.02) but not state performance-prove (β=.04, p=.50) or state performance-avoid (β=-.03, p=.60) goals. Therefore, partial support was found for Hypothesis 2a, in that fairness perceptions were related to state performance-avoid goals and utility perceptions were related to state mastery goals.

Hypothesis 3. Hypothesis 3 suggested that feedback perceptions would indirectly influence learning, such that they would be positively related to feedback usage and feedback usage would be positively related to learning. Results suggest that neither utility perceptions (β=.13, p=.06) nor fairness perceptions (β=.04, p=.55) predicted objective acceptance of feedback. Objective acceptance, in turn, was not significantly related to declarative knowledge (β=.03, p=.50) or skills test performance (β=.08, p=.06). Therefore, no evidence was found to support Hypothesis 3.

Post-Hoc Tests

Limited support was found for the hypothesized model. Therefore, alternative explanations were examined through an exploratory process. Specifically, overall effects of monitoring purpose were examined. It was found that fairness perceptions differed across monitoring groups (F(2,515)=3.26, p=.04), such that fairness perceptions were higher for the developmental monitoring condition than when monitoring was off (p=.04). Utility perceptions (F(2,491)=2.39, p=.09), acceptance (F(2,515)=2.05, p=.13), declarative knowledge (F(2, 515)=.20, p=.82), and skills test performance (F(2, 489)=2.61, p=.07) did not significantly differ across monitoring groups.

Following this, the overall impact of monitoring (regardless of purpose) was tested. Monitored trainees overall were less likely to pursue state mastery goals than

participants who were not monitored (t=-2.2, p=.01). Further, individuals who were monitored may have had higher fairness perceptions ($m_{non\text{-}monitored}=3.9$, $SD_{non\text{-}monitored}=.07$, $m_{monitored}=4.2$, $SD_{monitored}=.05$; t=1.87, p=.06) and performed marginally better on the skills test than those who were not monitored ($m_{non\text{-}monitored}=3.6$, $SD_{non\text{-}monitored}=.21$, $m_{monitored}=4.1$, $SD_{monitored}=.15$; t=1.94, p=.05). Regarding fairness perceptions, it seems that fairness perceptions were strongly affected by how confident an individual was that their behavior was being monitored. Monitoring likelihood alone was significantly related to fairness perceptions (β=.16, p<.01) and this relationship held true when controlling for monitoring condition (β=.15, p<.01). In fact, a dominance analysis[4] suggested that monitoring likelihood explained about 67% of the recovered variance in fairness perceptions, compared to about 33% explained by monitoring condition. Additionally, interactive effects were examined for those who "failed" the manipulation check (i.e., responded that they were confident they were monitored when in fact they were not or vice versa). Significant interactions were found for fairness perceptions, such that this effect was actually stronger for those who "passed" the manipulation check. Those who "failed" had higher fairness perceptions when they weren't monitored. Therefore, an individual's confidence that they are being monitored may be a stronger predictor of fairness perceptions than whether or not they were actually monitored. This is fitting, given that many participants in the non-monitored condition were fairly confident they were in fact monitored.

Finally, all hypotheses were tested using only those participants who passed the manipulation check, where passing was defined as either being in the non-monitored and being confident that they were not being monitored (less than 25% certain that they were

[4] Conducted using the user-generated domin package in Stata.

being monitored) or being in one of the monitored conditions and being confident that they were being monitored (at least 75% certain that they were being monitored). This resulted in a substantial decrease in participants (only 209 remained after this filter was applied). The underlying structural model again demonstrated poor fit (χ^2=1736.6, *df*=1,085, *p*<.01; RMSEA=.05, CFI=.91, SRMR=.06). Modification indices suggested the addition of the same correlated error terms that were added to the original model, bringing the measurement model's fit to marginally better levels (χ^2=1598.7, *df*=1,082, *p*<.01; RMSEA=.05, CFI=.93, SRMR=.06). The full structural model again demonstrated marginal fit (χ^2=1728.4, *df*=1,091, *p*<.01; RMSEA=.05, CFI=.91, SRMR=.1) and suggested the addition of the same covariances that were added in the original test. The addition of these covariances resulted in a marginal increase in fit (χ^2=1,594.1, *df*=1,087, *p*<.01; RMSEA=.05, CFI=.93, SRMR=.07). Results of this model are presented in Table 6. Importantly, limiting the sample to only those who passed the manipulation check did not meaningfully change the study's conclusions.

Summary

Perceived monitoring purpose did not have a strong influence on learners' state goals, which were more strongly driven by their trait goal orientations. Further, state goals were only marginally predictive of feedback perceptions and feedback perceptions did not have an impact on learning outcomes. At the bivariate level, declarative knowledge was positively related to performance-prove orientation. Developmental monitoring, mastery orientation, state mastery goals, and acceptance were positively correlated with skills test performance. Perceived evaluative monitoring, state performance-avoid orientation, fairness perceptions, and utility perceptions were

negatively correlated with skills test performance. Full path coefficients generated from the model are presented in Table 5.

Chapter 6: Discussion

The current study examined the impact of monitoring training environments on learning processes and outcomes. The study contributed to the theoretical and practical understanding of technology-enhanced training by examining what effects, if any, electronic monitoring has on trainees' goals, reactions, and learning outcomes. Building on existing theories of electronic monitoring, self-regulation, and performance management, it was hypothesized that monitoring would not have a uniform impact on learning processes and outcomes. Instead, it was hypothesized that these effects would depend on how monitoring was perceived by learners. Trainees who perceived monitoring as helping them develop their skills would be more likely to pursue mastery goals that result in more positive feedback perceptions and learning outcomes. In turn, trainees who perceived monitoring as evaluating their performance would be more likely to pursue performance goals that result in more negative feedback perceptions and learning outcomes. These hypotheses were built on well-established theories of self-regulation and performance management (e.g., Button et al., 1996; DeShon & Gillespie, 2005).

Some support was found for the hypotheses laid out above. Specifically, learners who perceived monitoring as having an administrative purpose were more likely to pursue performance-prove goals, and state mastery goals were positively related to how useful learners perceived feedback. Although both of these are in-line with established elements of the self-regulatory process (e.g., Elliot & McGregor, 2001), limited and inconsistent support was found for this model overall.

Instead, it seems that monitoring may be more likely to have a uniform, although limited, effect on trainees. Post-hoc analyses suggested that although monitoring may

result in lower mastery goals, it may also result in higher fairness perceptions and higher skills-test performance. Combined with the model results discussed above, this study can inform the theoretical development and practical implementation of monitored training environments. Both of these are explored in the following sections.

Theoretical Implications

The current study applied established self-regulatory theories to the emerging context of monitored training. Therefore, this study has theoretical implications for both self-regulation research and the development of theory around monitored training environments. Each of these is discussed separately below.

Self-regulation. Self-regulatory theory suggests that goals shape how individuals react to and use feedback for future behaviors (e.g., Deshon & Gillespie, 2005). Specific to learning, self-regulation requires high levels of metacognition and the ability to be an active participant in one's own learning (Zimmerman, 1990). A key feature of self-regulated learning strategies is one's ability to engage in intermediate goal setting, generate self-oriented feedback, and use this feedback to further one's knowledge (Carver & Scheier, 1981). Strongly influenced by Dweck and Leggett's (1988) original work, learning is viewed to be dependent on one's ability to not only generate feedback, but also to interpret this feedback in a manner which furthers self-instruction. Dweck and Legget (1988) referred to patterns of feedback interpretation as the adaptive and maladaptive response patterns. Importantly, an individual's goals are said to create a situation in which the same outcome might be interpreted differently. As it relates to learning, then, an individual pursuing a performance goal might interpret a performance discrepancy as diagnostic information about their self and their ability. An individual

pursuing a mastery goal might interpret this same information as diagnostic of their learning strategies and revise these strategies accordingly (Stevens and Gist, 1997). Therefore, the theory states that goals shape an individual's feedback-seeking behaviors (VandeWalle & Cummings, 1997) and their intentions to act upon this information (Brett & Atwater, 2001).

This study may have identified a boundary condition to which self-regulatory theory may be less applicable. Much of the work on achievement goals has been conducted on children (e.g., Dweck & Elliot, 1988) and has been focused on an individual's ability to ignore distractions or persist on a particular task (e.g., Zimmerman, 1990). Many studies have been conducted in traditional educational settings in which an instructor and a student have personal interactions. This model of student and teacher interactions does not directly apply to the current study's conceptual or operational context. Learners in this study were in a one-time learning context in which there was no direct instructor. This difference may highlight a boundary condition for traditional models of self-regulation and imply that a social element of this theory may be driving its effects. Students in this traditional model develop over a longer period of time through which they have interpersonal interactions with the instructor. Further research is needed to examine whether the core tenants of self-regulatory theory apply to online learning. This study has provided preliminary evidence that the theory may not fully replicate in this context.

One particular area that the theory seemed to not replicate was in the interplay between situations, traits, and states. One key element of self-regulatory theory is that goals are a function of both individual and situational factors. Originally discussed by

Button et al. (1996), situational factors were hypothesized to override an individual's goal orientation in strong situational contexts. No support for this was found in the current study; state goals were largely a function of trait goal orientation and not situational characteristics. Therefore, it is possible that this element of the theory may be limited to situations in which there are defined interpersonal interactions between a student and an instructor.

Perhaps a more relevant theory to draw from for this is DeShon and Gillespie's (2005) Motivated Action Theory (MAT). Specifically, they suggested the way individuals view a particular situation is shaded by their pattern of activated goals. Drawing a parallel between goals and personality traits, they argued that deviations from an individual's goal orientation exist but are minimal. This is similar to existing personality research which suggests that individuals will tend to exhibit behaviors in line with their personality traits, despite engaging in behaviors which fall along the full continuum of personality traits (Fleeson, 2001). The current study provides moderate support for DeShon and Gillespie's (2005) hypotheses regarding the dynamics between trait goal orientation and situations. Goal levels were more strongly related to an individual's goal orientation than their situational perceptions. Although situational perceptions did have some effect on goal pursuit, this effect was not large enough to be considered statistically significant. Therefore, it seems that goals are largely a function of an individual's goal orientation and that situational characteristics may have a limited impact on activated goal levels in this context.

DeShon and Gillespie's work on goal orientation can be combined with research on situational strength to further understand the potential interplay between states and

traits in an online context. In an online context, this implies that situational strength may be dependent on learners being aware that they are being monitored. For example, monitoring's strength may be dependent on how aware individuals are that they are being monitored (i.e., monitoring salience). Situational strength research has also suggested that strength might be a function of the variety of cues and incentives the situation offers (Meyer, Dalal, & Bonaccio, 2009). For example, situational strength is highest when an individual's decision-making autonomy is limited and when their decisions have strong consequential outcomes (Meyer & Dalal, 2009). Therefore, monitoring might be expected to have stronger results when monitored behaviors are tied to important consequences (to the extent that the monitoring and these outcomes remain salient). Thus, although the current study's hypotheses rested on the notion that monitoring inherently creates a strong situation, certain factors (such as consequences or perceived autonomy) might create stronger situations and therefore outcomes. As such, the results of this study highlight the importance of considering, and measuring, situational strength.

Finally, it should be noted that many of self-regulatory theory's underlying studies were tested using relatively simplistic analyses (correlations and t-tests; e.g., Pintrich & De Groot, 1990). In this sense, the current study's model-based approach is one of its strengths and contributions to theoretical development. Correlations and t-tests fail to account for the intercorrelations among goals. As such, these studies have examined the overall effect of a particular goal, rather than its unique contribution. This approach has persisted throughout self-regulatory research within organizational psychology. Many of the studies used to develop theory in this area have failed to account for the relationships among goals (e.g., Button et al., 1996; VandeWalle et al., 1999) and those which have

accounted for these intercorrelations have found similarly mixed results (e.g., Elliot & McGregor, 2001). This is evidenced in the fact that bivariate correlations found in this study do provide support for existing elements of self-regulation theory and the adaptive and maladaptive patterns suggested by Elliot and Dweck were found at this level. Mastery goal levels were positively related to fairness perceptions, utility perceptions, and skills-test performance. Performance-avoid goals were negatively related to fairness perceptions, feedback acceptance, and skills-test performance. At the bivariate level, goals in the current study were therefore related to feedback perceptions, acceptance, and learning outcomes in the theoretically-supported directions. Studies in this area which have used a model-based approach have focused on measuring self-regulatory learning strategies (e.g., McKenzie, Gow, & Schweitzer, 2004) or focused solely on trait goal orientation (e.g., Meece, Blumenfeld, & Hoyle, 1988; Phillips & Gully, 1997). Studies which have examined both state and trait goal orientation within a model have generally found that state goals are strongly related to trait goal orientation (e.g., Vandewalle, 1999) or have focused on interactive effects between training design and goal orientation (e.g., Bell & Kozlowski, 2008, Watson et al., 2013). The current study contributes to this area by examining the extent to which state goals are shaped by training characteristics. Overall poor fit for the model along with weak and inconsistent path coefficients provides preliminary evidence that the adaptive and maladaptive patterns hypothesized by Dweck and Elliot may be more complex than theorized. Although the theory has evolved since Dweck and Elliot's categorical classification of goals (i.e., classifying individuals as pursuing either performance or mastery goals) to allow for varying goal levels on multiple goals (e.g., Elliot & McGregor, 2001), the theory has not been re-

evaluated as a complete model. Although small components of the model may hold, the theory overall may benefit from continued model-based testing.

As such, this study contributes to self-regulatory theory by identifying potential limitations in the theory, including its applicability and its complexity. This study examined a context to which this theory had not been applied, online learning devoid of interpersonal interaction, and applied a model-based analytical technique. The overall lack of significant findings can be informative to the continued development of self-regulatory theory beyond its traditional classroom education–based origins.

Monitored Training. Organizations' desire for data-driven decisions, including recent big data trends, has placed a burden on researchers to understand the impact of electronic data collection methods on key outcomes. Combined with existing research, this study contributes to theoretical development in this area.

The current study hypothesized that goals, feedback perceptions, and feedback acceptance would be important factors to consider when examining the relationship between electronic monitoring and outcomes. Little support was found for this overall; although goals were predictive of feedback perceptions and acceptance at the bivariate level, these effects greatly decreased when controlling for trait goal orientation and other state goals. Therefore, other areas of self-regulated learning are perhaps of greater value for understanding electronic monitoring. In particular, electronic monitoring might have an effect on perceived task importance and task persistence (Stanton, 2000).

Additionally, electronic monitoring has implications for the development and importance of one's metacognitive ability. Whereas self-regulated learning research has stressed the importance of metacognition (e.g., Zimmerman, 1990), e-learning research

has demonstrated that learning prompts can facilitate important metacognitive processes (e.g., Sitzmann et al., 2010). As training moves toward increased data collection and feedback, the importance of metacognitive ability (as defined as a skill or trait) might decrease since the burden of metacognition is shifted toward training software instead of the individual. Therefore, although the elements of self-regulatory theory drawn upon within the current study provided limited explanatory power, other elements of self-regulated learning theories might still remain relevant for future research.

In particular, feedback perceptions, especially those related to justice, seem to be of greatest importance for theoretical development in this area. Within the current study, fairness perceptions were a strong driver of feedback acceptance and skills test performance. Those who perceived that information was collected in a fair and accurate manner were more likely to accept the feedback given and perform well. In particular, monitoring provides a means through which objective data can be collected for developmental or administrative purposes; the more confident learners were that their behaviors were monitored, the more fair they perceived the feedback to be. This relationship has been hypothesized elsewhere in the literature. For example, Stanton (2000) highlights that monitoring implemented consistently, with employees' knowledge, and with justification, can result in higher interactive, procedural, and distributive justice perceptions. The current study replicates this in a learning context. The electronic monitoring used in the current study met these criteria and resulted in similar effects. Therefore, the role of perceived information objectivity is one area prime for future development. Future research should directly test the perceived objectivity of feedback as it relates to monitoring, its justification, and feedback perceptions.

Practical Implications

Electronic monitoring can be a useful tool for organizations seeking to make decisions informed by objective data. Instead of wondering whether employees paid attention during training, managers can check performance logs automatically collected by training programs. Additionally, log data might be accessed to improve the training program (as is done in user experience research), to provide detailed information about employee performance on various modules, and to better understand each employee's learning process. This can provide timely and objective insight into employee performance and can help managers identify potential areas for employee development.

In this sense, electronic monitoring is a promising method for increasing the objectivity of decisions; a fact that might be appreciated by employees. The results of the current study demonstrate this point. The more confident learners were that their behaviors were monitored, the more likely they were to perceive the feedback as fair and just. Extant studies have shown this as well. For example, Stanton (2000) suggested that employees had higher fairness perceptions when monitoring was justified and explained to employees. Similarly, Niehoff and Moorman (1993) found that monitoring frequency was positively related to fairness perceptions.

This leads to two related implications. First, monitoring should be a transparent process. As data collection tools become more convenient and ubiquitous, many employees may have suspicions that their at-work behaviors are being tracked. Many participants in the non-monitored condition suspected that they were being monitored (about 20% of participants in this condition stated that they were at least 75% confident they were being monitored), despite being explicitly told they were not being monitored;

a finding which has been stressed in previous monitoring research (e.g., Thompson et al., 2009). Acknowledging monitoring and stating its purpose should increase the transparency of the process and allow participants to understand what was being monitored and why. This may work through an uncertainty-reduction mechanism.

However, fairness perceptions were only higher when individuals were told that they were being monitored for developmental reasons. This leads to the second implication: Not any justification will do. Trainees who were informed that they were being monitored in order to help evaluate their true performance did not feel that the process was any fairer than those who were told that their performance was not monitored at all. Those who were informed that they were being monitored to help them develop their skills, however, were more likely to feel that the monitoring was fair. Therefore, although monitoring purpose did not necessarily impact learners' goals, it did affect how fair they perceived the process to be.

Finally, the overall small effects found in the current study might be promising for future e-learning and training development. As universities and organizations begin to offer online degrees and certifications, they are looking toward electronic monitoring to maintain training and testing integrity (e.g., Foster, 2009). At their core, online certifications are generally comprised of two steps: learning and testing/demonstrating. Previous research has suggested that although monitoring during testing may decrease cheating, it can also result in negative affect (Karim et al., 2014). This study contributes to the growing body of literature (e.g., Thompson et al., 2009; Watson et al., 2013) examining monitoring during the learning process itself. Similar to the findings of Karim et al. (2014), this study has shown that monitoring might be an effective means of

capturing behaviors and providing feedback with few immediate negative behavioral outcomes. As such, in high-stakes contexts which require online learning and certification, electronic monitoring might be an appropriate tool to ensure that learners are actually completing the required training and not cheating on certification tests. This is an important step in online learning certification and adoption since it helps maintain the integrity of the certification.

Limitations

The current study is not without its limitations. In particular, the study's sample and manipulation might limit its generalizability.

Sample. First, the sample used in the current study consisted of online workers who were paid to complete a short-term training program; a situation which may differ from more traditional organizationally-led e-learning. In particular, the workers and the researchers had a short-term relationship that did not extend beyond the training program. Whereas the current study examined how monitoring might affect in-training processes, monitoring's effects can occur outside training itself. For example, an organization's decision to implement electronic monitoring might be seen as a sign of mistrust by employees (Tabak & Smith, 2005). The interdependent relationship between workers and the organization relies on mutual trust, which when violated may result in decreased commitment and future distrust (Schoorman, Mayer, & Davis, 2007). These effects are too far-reaching to have been captured in the current study, which was rather limited in its focus. Related to this point, the study may have also benefited from the inclusion of a wider range of outcomes, including future behavioral intentions (i.e., intent to enroll in future training) and perceptions of trust. Outside of the organizational training literature,

the self-regulated learning literature identifies a number of additional variables which were not identified in this study. For example, metacognitive ability and task persistence are often identified as important variables for self-regulated learning (e.g., Pintrich & De Groot, 1990), despite not being directly included in the current study's theoretical framework. As is discussed in the following future directions section, the act of monitoring might signal cues regarding task importance which could foster increased persistence. The addition of these constructs could have provided initial insight into long-term outcomes of electronic monitoring during training.

It is important to note that although the sample and context used might limit the study's scope of generalization, this sample and context were appropriate for the research questions examined. The training paradigm used in the current study is most applicable to one-off training programs or modules, such as online certifications, on-the-job training, or self-initiated learning (e.g., voluntary enrollment in a MOOC). Additionally, the sample achieved its intended purpose of providing a diverse range of participants in terms of race/ethnicity, educational background, and age. Further, the sample's convenience itself should not be viewed as a limitation (Landers & Behrend, 2015). Finally, recent research in the area suggests that Mechanical Turk workers may be an appropriate sample for studying short-duration online learning as a result of their higher motivation to learn and representativeness (Cavanaugh et al. , 2014).

Two potential limitations arise specific to the use of Mechanical Turk workers. First, the nature of their work might lead to lower privacy and trust expectations. Because of the inherent anonymity of workers and requesters in this relationship, workers may have come to expect various tools being used to monitor the quality of their work.

Research in this area may benefit from examining this hypothesis more directly to understand the appropriateness of online workers for electronic monitoring studies. Second, MTurk workers may be more likely to pursue self-development goals than participants in other samples. This could explain the higher levels and decreased variance in mastery goals, which may be the cause of a few of the study's small effects.

Generalizability. Second, as with any experiment, the generalizability of the findings are dependent on the accuracy, strength, and representativeness of the manipulation. Manipulation checks suggested that the manipulation did have its intended effect of leading participants to believe that their behaviors were being monitored and that the monitoring was being conducted for one of two reasons. However, the manipulation may not have been strong enough to result in the expected differential outcomes. Drawing from DeShon and Gillespie's (2005) framework, goal states exist within a broader hierarchy of goals such that goals are a function of activation patterns at higher levels of the hierarchy. The manipulation used in the current study was not targeted at the higher-level self-goals which are most likely to result in goal trait-state incongruence (agency, affiliation, and esteem). Instead the manipulation was more in line with the theory's principle goals of growth, fairness, structure, and social value (although primarily focused on growth and fairness). This level of the hierarchy may have limited effects on achievement goals and action plan goals (such as feedback seeking). Although the manipulation was chosen to most accurately replicate monitoring's implementation in organization-led training, this may have resulted in smaller effects. Therefore, although the monitoring manipulation may have been accurate and representative of how

monitoring is used in practice, it may not have been strong enough to result in the hypothesized effects.

Future Directions

Much work is still needed to understand the application of electronic monitoring to training. Specifically, future work in this area may build upon the current study's scope and purpose. Each of these is detailed below.

Scope. As discussed above, the current study limited its focus to in-training behavioral processes and outcomes affected by monitoring. Self-regulatory theory was used as a framework to examine how monitoring might affect micro-level effects, such as goal setting and learning. However, monitoring may have a more profound and macro-level effect on employees and organizations. For example, Stanton's (2000) model of electronic monitoring suggests that electronic monitoring might affect employees' role priorities and perceived task importance. This implies that the act of monitoring might lead learners to believe that the task is more important and direct more of their attention toward this task. Since monitored behaviors are captured and potentially evaluated, learners may be more motivated to direct their attention toward tasks that are explicitly monitored.

Stanton's (2000) model also suggests that monitoring might affect *attributed trust*, or the extent to which workers believe that the organization trusts them to sufficiently perform their work. With respect to training, learners might think that the organization does not believe they have the capability to engage in the self-regulatory skills necessary for self-instruction (a fact which has led some to specifically design interventions with this in mind; e.g., Sitzmann & Ely, 2010). Monitoring and interventions do not exist in a

vacuum; although such interventions might be effective at increasing learning outcomes, when applied to organizational training, these interventions may imply a lack of trust on behalf of the organization. Future research is needed to examine this highly cognitive outcome and attribution as this might help illuminate longer-term effects of employee monitoring and how monitoring affects the evolution of the employee-employer relationship. This is of critical importance if monitoring is to be used during completion of onboarding or company-mandated training when employees are first beginning the job and when the employer-employee relationship is first evolving.

Outside of organizationally-initiated monitoring, recent trends have encouraged self-initiated monitoring. For example, fitness trackers and wearables allow individuals to quantify their daily behaviors. In fact, many elements of one's life (from the amount and quality of sleep to the number of steps taken in one day) are now able to be quantified. The fact that individuals readily engage in self-initiated monitoring has strong implications for organizationally-led monitoring. First, it stresses the role of autonomy. As highlighted in Stanton's (2000) model, individuals who feel a sense of control over electronic monitoring perceive it as less invasive and more just. The current study certainly echoes the notion that individuals may enjoy elements of their behavior being quantified. As discussed previously, monitoring may lead to an increased perception of information objectivity and feedback acceptance. Therefore, organizational training may benefit from self-initiated monitoring. In order to further this area, research is also needed into the personality and situational characteristics which encourage self-initiated monitoring.

These individuals may be in stark contrast to those who are generally suspicious of data collection and organizational uses of data. This further stresses the role of individual differences in electronic monitoring which should be explored in future research. Specifically, research should examine the factors that lead an individual to be suspicious that their behaviors are being monitored and the impact of this suspicion on behaviors. Within the current study, for example, about one-fifth of individuals who weren't monitored were suspicious that their behaviors were in fact monitored. These individuals may be generally suspicious of others' use of their data. For example, Stone, Gueutal, Gardner, and McClure (1983) highlight that individuals differ in their value for and beliefs in privacy for organizationally-relevant data. Preliminary evidence suggests that individuals who distrust organizational uses of data are generally higher on evaluation apprehension and may have lower context-specific self-efficacy (Karim et al., 2014). Therefore, individual differences (particularly those related to trust in data collection or usage) may be relevant for monitored training since individuals who do not trust the entity which is collecting their data may be more likely to be anxious during training. The role of individual differences in electronic monitoring cognitions and acceptance should be further explored.

Purpose. Monitoring is used for a range of purposes, including personnel selection (e.g., Karim et al., 2014), performance evaluation (e.g., Stanton, 2000), and training (e.g., Watson et al., 2013). Although the current study continued the integration of these three lines of research, further work is needed in this area. In particular, future research should examine the key contextual variables that differentiate these three applications. One factor which differentiates these three contexts could be the maturity of

the employer-employee relationship. Electronic monitoring during employee selection occurs before the formal beginning of the employer-employee relationship and thus negative reactions to monitoring at this stage might be related to withdrawal from the application process (Karim et al., 2014). Those applicants who remain through the selection process and ultimately join the organization may be doing so with a lack of attributed trust. Adding performance monitoring to onboarding and new employee training might further strain this relationship and limit overall employee commitment. Continued monitoring into the performance management process might strain this relationship further yet. Simply put, monitoring might convey a lack of trust on behalf of the employer; a perception which might negatively impact development of organizational commitment and trust. Therefore, future research is needed to further understand the full scope of electronic monitoring's effects and how these effects might be driven by relationship maturity.

Chapter 7: Conclusion

The current study examined the effects of perceived monitoring purpose on in-training behaviors and outcomes. By doing so, this study contributes to the burgeoning area of electronic monitoring research and the practical need for experimental research in this area. It was found that perceived monitoring purpose did not have a strong effect overall. Although this might be encouraging news for organizations at the surface, more research is needed in order to truly understand the impact of electronic monitoring on employees. These effects might extend beyond training to influence how employees approach their full range of tasks and employees' attitudes toward the organization. Regardless, it is recommended that, when implemented, monitoring should be clearly explained and justified to employees and that employees' voice in the manner be considered.

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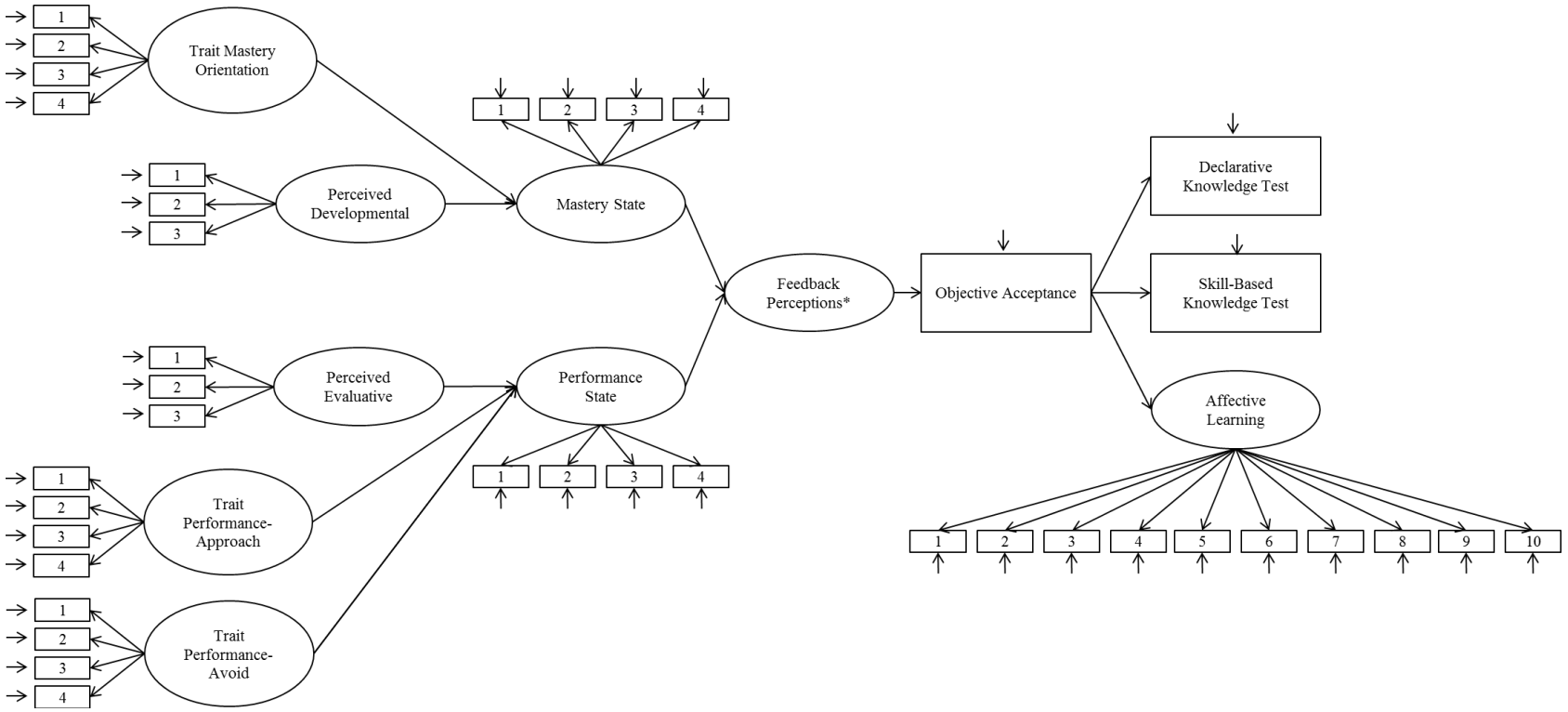


Figure 1. Overview of Structural Equation Model. *Note: Dimensionality and structure of feedback perceptions will be tested prior to analysis.

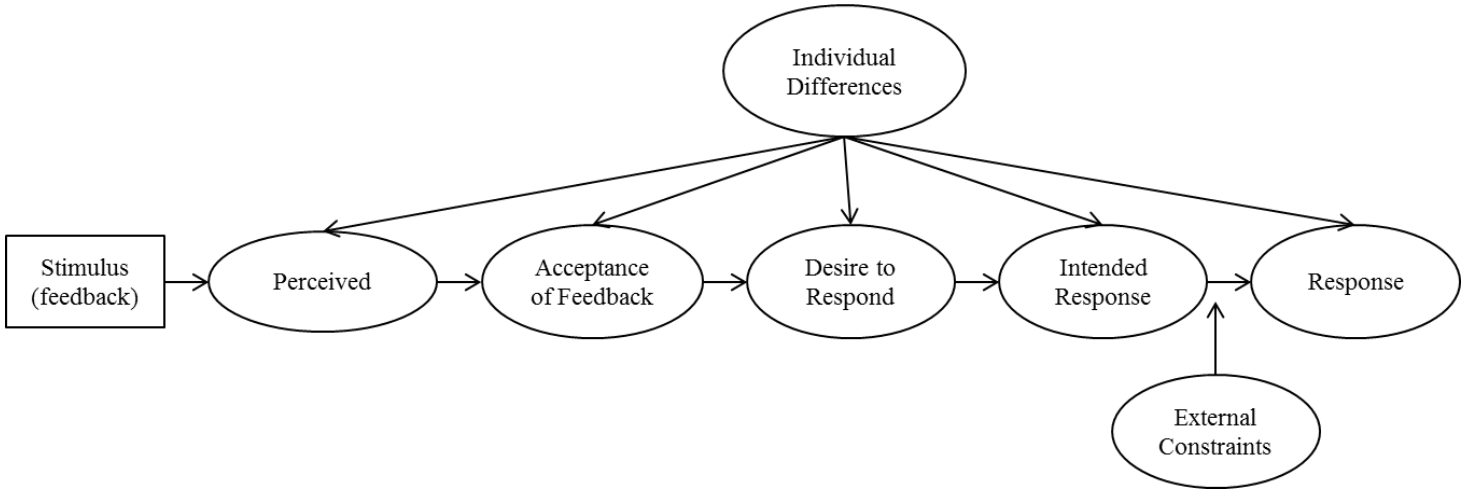


Figure 2. Model of Feedback Acceptance, Reproduced from Ilgen et al. (1979).

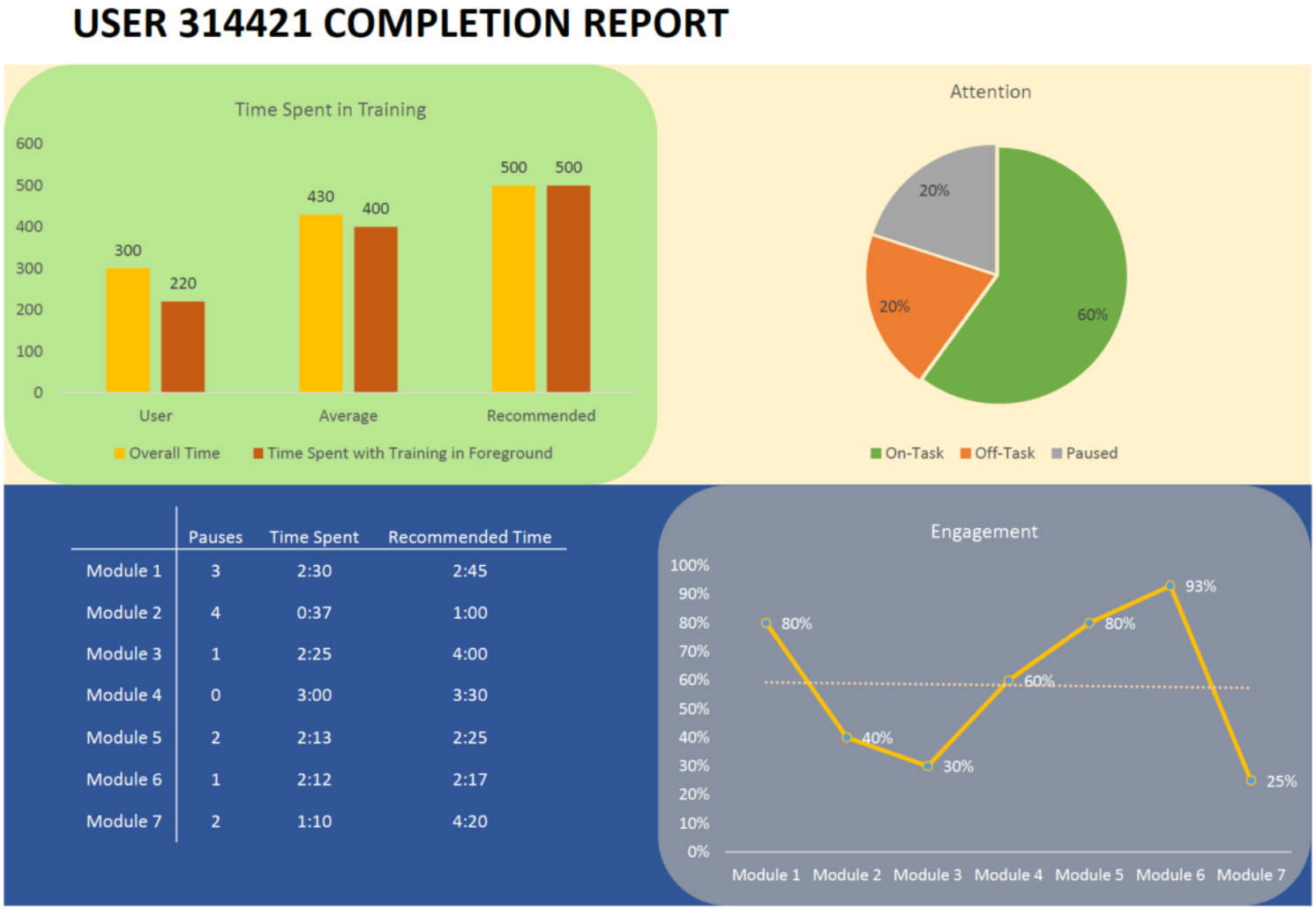


Figure 3. Example Completion Report.
Note: Figure 3 was presented to learners prior to completing training. Participants were notified that this full completion report will only be generated for the researchers and they would receive a more minimal report.

Table 1. Perceived Monitoring Purpose Factor Loadings

Item	Factor 1	Factor 2	Uniqueness
This training will use monitoring to help me learn better during training	.88		.23
This training will use monitoring to produce feedback that can be used to help me learn better during training	.91		.19
This training will use monitoring to identify areas of my performance that could be further developed during training	.84		.27
The monitoring software will be used to help me become a better learner	.88		.23
The monitoring software will be used to help me maximize how much I learn	.86		.26
This training will use the monitoring system to prevent wrong doing during training		.81	.29
This training will use monitoring to detect possible misconduct or fraud during training		.94	.13
This training will use monitoring to discourage workers from doing something wrong during training		.92	.18
The monitoring software may be used to determine whether or not I have fully completed the HIT		.68	.51

Table 2. State Goals Factor Loadings

Item	Factor 1	Factor 2	Factor 3	Uniqueness
In training, I would like to hide that other workers are better than me			.85	.33
In training, I would like to avoid situations where I might demonstrate poor performance			.69	.53
In training, I would like to try to avoid discovering that other workers are better than me			.87	.28
I would be reluctant to ask questions about this training because the requesters may think I'm incompetent			.63	.57
It is important to me to perform better than other workers		.66		.52
It is important to me to impress the requesters by doing a good job on this training		.82		.35
I want the requesters to recognize that I am one of the best at this training		.87		.28
I want to show myself how good I am at this training		.54		.59
I prefer to work on aspects of this training that force me to learn new things	.74			.46
I am willing to work on challenging aspects of this training that I can learn a lot from	.82			.32
The opportunity to learn new things about this training is important to me	.88			.25
The opportunity to work on challenging aspects of this training is important to me	.84			.25

Table 3. Feedback Perceptions Factor Loadings

Item	Factor 1	Factor 2	Uniqueness
The feedback I received was an accurate evaluation of my performance	.81		.29
It was hard to take this feedback seriously	.67		.56
I did not agree with the feedback provided	.79		.37
The procedures used to generate feedback were fair	.79		.33
The procedures used to generate feedback were appropriate	.78		.33
The feedback I received was fair	.88		.22
I agreed with the feedback I received on the task	.81		.18
I agreed with the way the training rated my performance	.84		.19
The feedback fairly represented my work on the task	.82		.22
The feedback helped me understand how I can learn the material better		.76	.34
I learned a lot from the feedback		.85	.19
The feedback helped me understand my mistakes		.70	.40
I had a clearer idea of what is expected because of the feedback		.82	.31

Table 4. Variable Means, Standard Deviations, and Correlations

	M	SD	Monitoring Off	Monitoring Develop	Monitoring Admn	Perceived Admn	Perceived Develop	Mastery
Monitoring Off	0.38	0.49	1.00					
Monitoring Develop	0.31	0.46	-0.53	1.00				
Monitoring Admn	0.31	0.46	-0.53*	-0.45*	1.00			
Perceived Admn	2.56	1.20	-0.38*	-0.14*	0.53*	1.00		
Perceived Develop	2.93	1.19	-0.55*	0.44*	0.14*	0.39*	1.00	
Mastery	4.16	0.67	0.07	-0.07	-0.01	-0.01	-0.06	1.00
PPO	3.70	0.88	0.09*	-0.06	-0.04	-0.03	-0.05	0.31*
PAO	2.52	0.92	<.01	-0.03	0.03	0.05	0.02	-0.38*
State Mastery	3.92	0.66	0.09*	-0.10*	<.01	<.01	-0.05	0.57*
State PPO	3.41	0.86	0.08	-0.13*	0.05	0.09*	0.02	0.15*
State PAO	2.40	0.91	0.07	-0.06	-0.02	0.04	<.01	-0.28*
Fairness	4.09	1.00	-0.07	0.11*	-0.03	<.01	0.12*	0.10*
Utility	3.40	1.17	-0.02	0.09*	-0.08	0.04	0.14*	0.13*
Acceptance	0.71	1.20	<.01	-0.07	0.08	0.02	0.04	0.07
Declarative	4.34	1.16	0.01	0.01	-0.03	-0.04	-0.04	0.05
Skills Test	3.93	2.71	-0.09	0.09*	<.01	-0.11*	-0.08	0.14*

*Note: M=mean, SD=Standard Deviation, Admn=Administrative, PPO=Performance-Prove Orientation, PAO=Performance-Avoid Orientation. N=493-518, pairwise correlation used. *=p<.05.*

Table 4 (Continued)

	PPO	PAO	State Mastery	State PPO	State PAO	Fairness	Utility	Acceptance	Declarative	Skills Test
Monitoring Off Monitoring Develop										
Monitoring Admn Perceived Admn										
Perceived Develop Mastery										
PPO	1									
PAO	0.14*	1								
State Mastery	0.16*	-0.32*	1							
State PPO	0.52*	0.18*	0.33*	1						
State PAO	0.08	0.51*	-0.23*	0.26*	1					
Fairness	0.08	-0.15*	0.16*	0.07	-0.18*	1				
Utility	0.06	-0.10*	0.13*	0.10*	-0.04	0.65*	1			
Acceptance	-0.07	-0.08	0.10*	<.01	-0.14*	0.14*	0.16*	1		
Declarative	0.11*	0.01	0.03	0.08	-0.07	-0.09	-0.08	0.03	1	
Skills Test	0.02	-0.04	0.09*	-0.01	-0.14*	-0.18*	-0.20*	0.11*	0.29*	1

*Note: M=mean, SD=Standard Deviation, Admn= Administrative, PPO=Performance-Prove Orientation, PAO=Performance-Avoid Orientation. N=493-518, pairwise correlation used. *=p<.05.*

Table 5. Path Coefficients

	β	*p*
State Mastery (R^2=.41)		
LGO	.56	<.01
PPO	.02	.63
PAO	-.13	.01
Perceived Develop	-.03	.51
Perceived Admn	.03	.57
State Performance-Avoid (R^2=.33)		
LGO	-.12	.03
PPO	.05	.35
PAO	.51	<.01
Perceived Develop	-.03	.56
Perceived Admn	.04	.45
State Performance-Prove (R^2=.38)		
LGO	.02	.74
PPO	.57	<.01
PAO	.10	.06
Perceived Develop	-.01	.78
Perceived Admn	.14	<.01
Fairness (R^2=.05)		
State Mastery	.07	.23
State PPO	.10	.10
State PAO	.19	<.01
Utility (R^2=.03)		
State Mastery	.15	.02
State PPO	.04	.49
State PAO	-.03	.59
Objective Acceptance (R^2=.03)		
Fairness	.04	.55
Utility	.13	.06
Declarative Knowledge (R^2=.01)		
Objective Acceptance	.03	.50
Skills Test (R^2=.01)		
Objective Acceptance	.08	.06

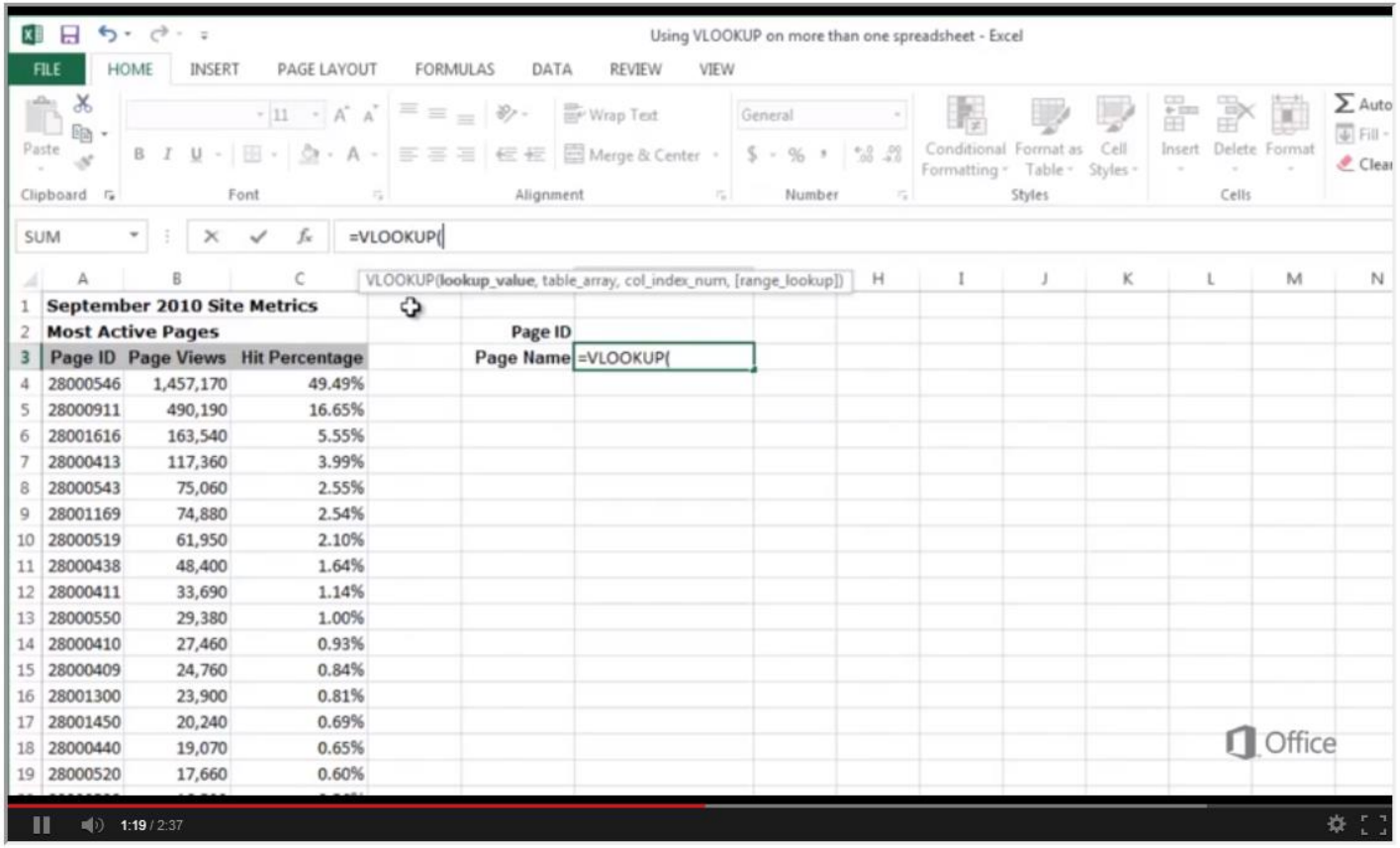
Table 6. Path Coefficients for Restricted Sample

	β	*p*
State Mastery (R^2=.54)		
LGO	.64	<.01
PPO	.05	.42
PAO	-.18	.01
Perceived Develop	-.07	.28
Perceived Admn	-.02	.72
State Performance-Avoid (R^2=.25)		
LGO	-.18	.03
PPO	.15	.07
PAO	.36	<.01
Perceived Develop	-.10	.20
Perceived Admn	.05	.53
State Performance-Prove (R^2=.38)		
LGO	.03	.66
PPO	.59	<.01
PAO	.02	.82
Perceived Develop	-.03	.65
Perceived Admn	.18	.01
Fairness (R^2=.02)		
State Mastery	-.07	.41
State PPO	.08	.40
State PAO	-.17	.05
Utility (R^2=.04)		
State Mastery	.02	.06
State PPO	.05	.58
State PAO	.11	.23
Objective Acceptance (R^2=.03)		
Fairness	.03	.78
Utility	.14	.14
Declarative Knowledge (R^2<.01)		
Objective Acceptance	.04	.58
Skills Test (R^2=.01)		
Objective Acceptance	.08	.27

Appendix A: Training Video

Vlookup Part Three

Monitoring is On



Appendix B: Feedback Presented After Each Module

Vlookup Part 3 Test Yourself Feedback

You got 2 out of 3 questions correct for this video.

Your responses and the correct responses to each question are listed below.

	Your Response	Correct Response
What symbol do you need to use when referencing the name of another worksheet?	!	!
You have two tabs. One called "Address" and one called "Phone." You would like to match the data on "Phone" with that on "Address." Which function would accomplish this?	=vlookup(A3,Address!B3:C50,2,False)	=vlookup(A3,Address!B3:C50,2,False)
Why was "False" used in the above example?	Because the function used multiple tabs	To return an exact match

Time spent on video: 75.322 seconds.

Recommended time for video: 183 seconds.

It is recommended that you review this video.

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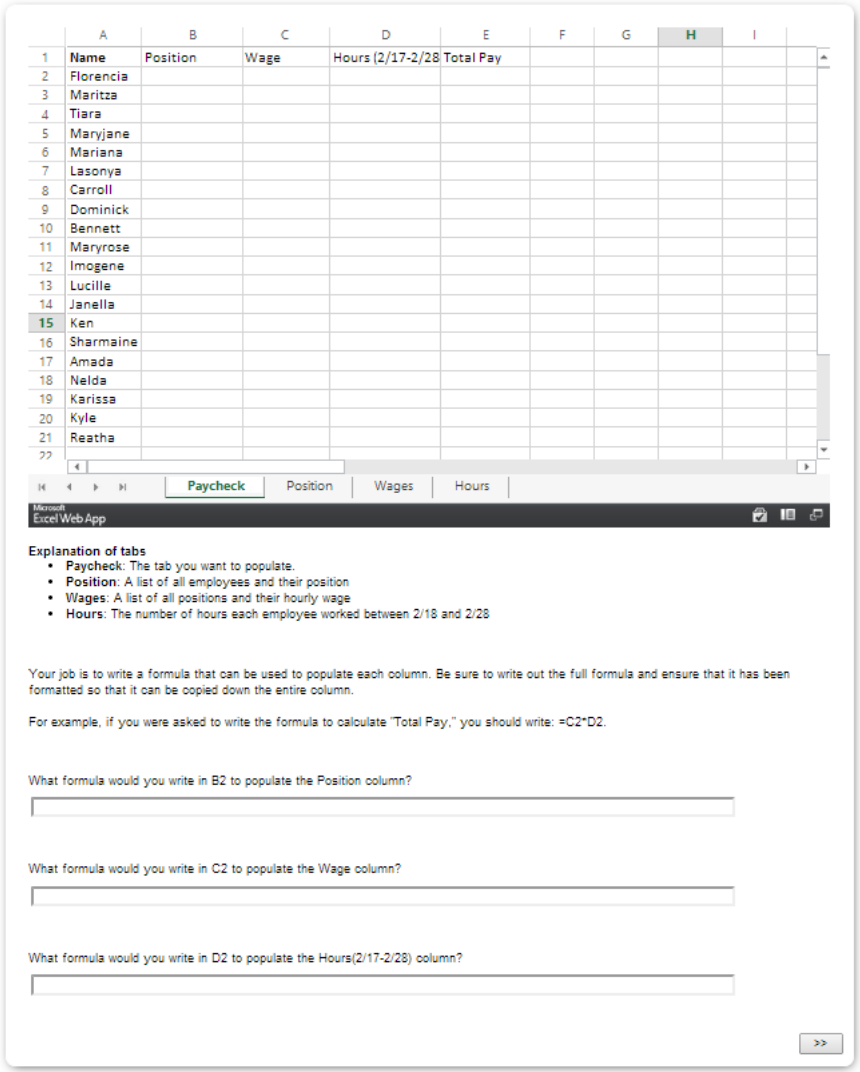
Appendix C: Skills Test



	A	B	C	D	E
1	**Name**	Position	Wage	Hours (2/17-2/28	Total Pay
2	Florencia				
3	Maritza				
4	Tiara				
5	Maryjane				
6	Mariana				
7	Lasonya				
8	Carroll				
9	Dominick				
10	Bennett				
11	Maryrose				
12	Imogene				
13	Lucille				
14	Janella				
15	Ken				
16	Sharmaine				
17	Amada				
18	Nelda				
19	Karissa				
20	Kyle				
21	Reatha				

Paycheck | Position | Wages | Hours

Microsoft Excel Web App

Explanation of tabs

- **Paycheck**: The tab you want to populate.
- **Position**: A list of all employees and their position
- **Wages**: A list of all positions and their hourly wage
- **Hours**: The number of hours each employee worked between 2/18 and 2/28

Your job is to write a formula that can be used to populate each column. Be sure to write out the full formula and ensure that it has been formatted so that it can be copied down the entire column.

For example, if you were asked to write the formula to calculate "Total Pay," you should write: =C2*D2.

What formula would you write in B2 to populate the Position column?

What formula would you write in C2 to populate the Wage column?

What formula would you write in D2 to populate the Hours(2/17-2/28) column?

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