DISSERTATION

EXAMINING SCIENCE/KNOWLEDGE GAPS WITHIN OCCUPATIONAL HEALTH PSYCHOLOGY, ORGANIZATIONAL TRAINING, AND PERFORMANCE FEEDBACK

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In partial fulfillment of the requirements

For the Degree of Doctor of Philosophy

Colorado State University

Fort Collins, Colorado

Summer 2024

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ABSTRACT

EXAMINING SCIENCE/KNOWLEDGE GAPS WITHIN OCCUPATIONAL HEALTH PSYCHOLOGY, ORGANIZATIONAL TRAINING, AND PERFORMANCE FEEDBACK

Identifying and minimizing knowledge gaps between science and practice within Industrial-Organizational (I-O) is essential to improve workers' health and wellbeing as well as their broader experiences at work by ensuring that organizations use empirically supported practices. Though the science/practice gap has been recognized and studied in some areas of I-O psychology, such as selection, the purpose of this study was to investigate the science/knowledge gap in new subfields such as occupational health psychology (OHP) and performance feedback. The current study also attempted to assess the science/knowledge gap in organizational training, which has been examined in previous research. However, our study not only examined the science/knowledge gap among practitioners, as previous research has, but also among academics for all three subtopics of OHP, performance feedback, and organizational training. This cross-sectional study examined the relationships between 218 participants' demographic variables (e.g., occupation, self-perceived expertise) and their knowledge of I-O psychology research measured by true/false items summarizing published findings. Results indicated academics answered more true/false items correctly compared to practitioners. However, findings regarding relationships between correct responding and participants' coursework on relevant topics were mixed. Implications from these findings are discussed in light of empirical and applied contributions to the literature.

ACKNOWLEDGEMENTS

I want to thank everyone who has supported this project through their time, mentoring, and role modeling. First, thank you to my advisor, Dr. Gwen Fisher whose authenticity, kindness, and instruction have been invaluable to for this project and my own growth. I would also like to thank the members of my committee including Drs. Dan Graham, Bryan Dik, and Bill Brazil for being helpful teachers and role models throughout this project and beyond it. I also want to thank Dr. Alyssa Gibbons for her insights and guidance during my empirical comprehensive project, which was an important preliminary step for this dissertation project. Additionally, I would like to thank my undergraduate research assistant Richard Boustred for his help on this project's early literature review.

I am also grateful that my graduate training was supported by the National Institute Occupational Safety and Health (NIOSH) Center for Health, Work, and Environment, a Center of Excellence in Total Worker Health (1 U19 OH 011227), and the Mountain and Plains Education and Research Center (T42OH009229), particularly as this research helped inform this dissertation project. Last but not least I want to thank the Colorado State Department of Psychology, as this dissertation project was supported by funding received from the Success Grant from the Colorado State University Department of Psychology.

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CHAPTER 1: INTRODUCTION

One of the hallmarks of industrial-organizational psychology is the strong emphasis on and foundation of the scientist-practitioner model. In other words, science informs best practices to be implemented in organizations, and observations about work and organizations can and should inform systematic research. Despite consistent and long-standing evidence that empirically supported human resource practices (e.g., the use of structured, behaviorally-based interviews for hiring employees) are associated with improved organizational outcomes such as organizational productivity and performance (Saridakis et al., 2016; Becker & Gerhart, 1996) many organizations do not implement such practices (Fisher et al. 2020; Rynes et al., 2002). In a recent meta-analysis of eight longitudinal studies, Saridakis et al. (2017) found an overall positive relationship (r = .29) between high-performance work practices (HPWP) and organizational performance measured later in time. HPWPs refer to interrelated human resource (HR) management practices that are empirically supported as facilitators of increased employee performance (Combs et al., 2006).

Some have suggested that the lack of implementation of HPWPs and this resulting research-practice gap is due to organizational managers and HR professionals being aware of best practices but failing to successfully implement them (Pfeffer & Sutton, 2000). Pfeffer & Sutton (2000) suggested that managers and HR professionals fail to implement best practices due to being risk-averse toward change or avoiding change because it is often more cognitively demanding compared to carrying out the organizational status quo. However, literature published since Pfeffer & Sutton (2000) tested managers' and HR professionals' knowledge of best practices has consistently found in many instances, and particularly in the domain of selection,

that managers and HR professionals are unaware of empirically-supported best practices in industrial-organizational (I-O) psychology and management (Rynes et al., 2002; Sanders et al., 2008; Fisher et al., 2020).

For instance, Rynes et al. (2002) conducted a survey utilizing true/false statements (e.g., "Most people over-evaluate how well they perform on the job") among 959 HR professionals. Their results indicated that the average respondent answered 57% of items correctly (Rynes 2002). The area in which responses appeared to diverge most from research findings was employee selection. Rynes et al. (2002) concluded HR managers are generally unaware of the selection literature. Reasons for this especially large science practice gap in selection may be that selection research is more technical than other areas of HR management, thus research findings rely more on meta-analysis or statistical corrections such as for measurement error.

A replication of the seminal Rynes et al. (2002) study by Sanders et al. (2008) with 626 Dutch participants found similar results. Specifically, Sanders et al. (2008) referred to their findings as "remarkably" similar to findings from Rynes et al. (2002), including the substantially larger science practice gap in selection and recruitment compared to other areas, as well as the finding that HR professionals who read research more frequently have greater knowledge of organizational best practices. Similarly, Fisher et al. (2020) replicated the seminal study by Rynes et al. (2002) with a sample of 453 HR practitioners in the United States and Canada and found the research practice gap persists, with the research practice gap slightly expanding in the domain of selection.

However, a potential reason for the perceived science/knowledge gap between research and practice could be a more general lack of consensus in the field about this information. For instance, previously cognitive ability had been considered the strongest predictor of job

performance since a seminal meta-analysis finding this result (Schmidt & Hunter; 1998). However recently a new meta-analysis found cognitive ability may not actually be the strongest predictor of job performance, falling short compared to other predictors of performance including work samples, structured interviews, and job knowledge (Sackett et al., 2023). Consequently, there are often new findings and areas of dispute within I-O psychology that may cause disagreement among academics and practitioners alike, fueling the perception of a science/knowledge gap.

Purpose of the Current Study

The purpose of the current study was to examine the science/knowledge gap among professionals, including academics and practitioners (e.g., HR managers). In addition to separately examining knowledge among academics and practitioners, I compared results between these two samples as another approach for investigating the science-practice gap. Substantial research has examined practitioners' lack of knowledge regarding published research findings from I-O psychology (Rynes et al., 2002; Sanders, 2008; Tenhiälä et al., 2014; Fisher et al., 2020). However, I have not found research that explicitly compares knowledge of published research findings between I-O or management practitioners and academics. The current study thus assessed the number of correct answers in response to true/false items summarizing published findings in I-O psychology, which were answered by academics and practitioners trained in I-O psychology. This study builds on prior research about the science-practice gap by comparing knowledge of published I-O psychology findings among practitioners and academics.

Pilot Study

In preparation for this study, I conducted a preliminary study (phase 1a) in which I attempted to generate and validate true/false items containing information about published

research findings in I-O psychology, which would then be used in the current study. Item validation was based on feedback from 13 subject matter experts (SMEs) who gave quantitative and qualitative feedback after reviewing an initial set of true/false items. SMEs responded to quantitative items that gauged the degree content items (e.g., proposed items for the current study) were consistent with published research findings, important to HR/organizational practice, and contained useful information for managers/supervisors. Qualitative items allowed open responses from SMEs and asked if they had any suggestions for how to reword each item to make it clearer or more relevant. SMEs were also given the opportunity to provide additional comments in case SMEs had any additional broader feedback on each item. Last, at the end of each topic (e.g., OHP, performance feedback, training & development) section, SMEs were invited to submit their own potential item(s). When assessing validity of items with Lawshe's CVR, which assesses SME agreement, items overall had generally low validity for SME agreement on the accuracy of content items, as well as the importance and utility of items. To summarize broadly, only two items in the current study could be considered generally acceptable (e.g., having significant values for Lawshe's CVR for two of three evaluative items). Both were OHP items. Results suggested that the remaining 26 items should be revised.

Based on the results I obtained from the pilot study I revised the items based on feedback from SMEs to increase accuracy, clarity and conciseness of items in the current study. Based on our initial validation efforts in which there was substantial disagreement among SMEs, it was not obvious that academics would have substantially greater awareness of published research findings in I-O psychology compared to practitioners.

Reasons for the Science/Practice Knowledge Gap

The idea that practitioners have a lack of awareness of empirically-supported findings is not new (Gannon, 1983). More interesting, however, is why such a knowledge gap exists. Possible explanations for the knowledge gap may be due to research being too onerous or technical for practitioners to peruse (Rynes, 2002) or lack of practitioner interest (Campbell et al.,1982). More recently Highhouse et al. (2020) found many practitioners do not perceive findings from I-O psychology journals to be relevant to their work (e.g., compared to their own niche's needed strategies) and many practitioners also lack trust in findings from I-O psychology journals, potentially due to the replication crisis (Maxwell et al., 2015). In the open-ended responses, one common concern was that I-O psychology research is too focused on trivial details, such as moderators or mediators with weak relationships with other variables in a given study (Highhouse et al., 2020). Another commonly reported concern was that research has too much emphasis on theory.

However, Rynes et al. (2002) found several other related findings in their seminal survey that may shed light on why the knowledge gap exists. For instance, managers with Senior Professional in Human Resources (SPHR) certification scored appreciably higher (d = .23; p < .01) compared to those without SPHR certification. Knowledge of HR practices was also higher among managers at higher job levels. However, it is unclear if these managers knew more due to learning while on the job or if they already had more knowledge of HR best practices prior to getting hired. Relatedly, compared to all other participants, practitioners who reported "usually reading" HR research scored substantially higher (d = .86; p < .05).

However, 75% of respondents reported never reading HR research from top academic journals and less than 1% reported that they "usually" read from the three most research-oriented

journals (*Journal of Applied Psychology, Personnel Psychology, and Academy of Management Journal*) on the list given to participants. Instead, the most common reading sources of practitioners, in order, were *Human Resource Magazine*, *Wall Street Journal*, and *HR Focus*, among others (Rynes et al., 2002). Greater knowledge of research findings was also associated with prior information-seeking strategies including use of consultants to gain information and academic reading (Rynes et al., 2002). However, the most common sources practitioners utilized for information when solving HR problems were HR professionals in their own organization and the Society for Human Resource Management (SHRM) website (Rynes et al., 2002). Interestingly, practitioners' years of experience and desire to learn had a negative relationship.

Rynes et al. (2002) recommended practitioner journals such as HR magazine incorporate input from researchers to help disseminate research findings, especially due to finding in her own study that most practitioners do in fact want to learn more about research findings (Rynes et al., 2002). However, some researchers may not be inclined toward publishing their research findings in practitioner journals for several reasons (Rynes et al., 2002). For instance, publishing in practitioner journals is not incentivized within academia. Moreover, researchers may not want to publish their findings in practitioner journals that may publish ideas that are inconsistent with empirical findings.

Due to the aforementioned challenges, in the current study I aimed to test the science knowledge gap in several key domains in I-O psychology and management. These domains include training, which has been included in previous studies (Rynes et al., 2002; Sanders et al., 2008), as well as several new domains that have not yet been explored in previous literature on the science practice gap, which are occupational health psychology (OHP), and best practices

regarding giving feedback. I will begin with a literature review on best practices within training, followed by OHP, and finally with organizational feedback.

Summary of Relevant Findings in Training

Training refers to helping employees acquire job-relevant knowledge and skills through systematic, planned efforts (Goldstein & Ford, 2002). Research has consistently found that systematic training based on the science of learning improves performance (Salas et al., 2012). It may not be surprising then that in the U.S., $235 billion is spent annually on training individuals in organizations (Patel, 2010). Moreover, decades-long research has uncovered core findings regarding training that can be applied within the workplace to improve organizational effectiveness. I will begin by reviewing fundamental best practices for before, during, and after training, followed by a review of best practices to increase training transfer before, during, and after training. I will conclude this section on training by reviewing contemporary empirical findings supporting specific training-related items used by Rynes et al. (2002) and the current study.

Best Practices Before Training. Prior to developing or conducting a training program, it is generally most effective to utilize a training needs analysis (Salas et al., 2012). A training needs analysis clarifies the training needs of the organization, its teams, and individuals (Bell et al., 2017). Evaluate what job tasks need to be trained on, who needs training, and clarify expected learning/behavior outcomes that will guide the training design and subsequent evaluation. This may also include specifying teamwork demands, how training variations will best fit each individual, or cognitive task analysis for more complex jobs.

Next, professionals should prepare the organizational climate for the training. This should include scheduling, specifically so there is minimal delay between training and application of it

on the job. Communicating is also essential, such as sharing about expectations of training, its opportunity-value, and about post training follow-up. The final steps include establishing attendance policies, such as whether attendance should be mandatory, and preparing supervisors and leaders, which refers to assisting supervisors and leaders on how to support employees, as well as send the right signals regarding training. Signals refer to cues that communicate that training is important to the organization, such as both presenters and attendees participating in training or asking employees about what action steps they will apply from training.

Best Practices During Training. During training, organizations should attempt to facilitate psychological capital among employees, such as self-efficacy, motivation, and learning orientation, which refers to employees perceiving training as an opportunity to learn and develop skills, rather than to merely reach a new level of subsequent performance (Salas et al., 2012). For example, to boost motivation, organizations should explain how training benefits employees such as by being relevant and practical.

Next, organizations should implement the right instructional principles. This includes many important steps. For example, elements of training should include information, demonstrations of good/poor behaviors, as well as allowing employees to practice and giving immediate feedback on how to improve. Additionally, employees should be given time to practice thinking through how they will transfer their training to new and more difficult situations during the training itself to better facilitate the habit of effective transfer.

Additional best practices during training include encouraging employees to self-monitor during training to assess their progress, incorporating errors into training to learn how to correct such errors, as well as allowing trainees to have the appropriate amount of control over training.

For example, training should have sufficient structure and directions but still allow individualized training according to trainees preferred learning experiences.

Last, using the appropriate mode (e.g., computer-based training vs. in-person training) of training is also essential (Salas et al., 2012). For example, while utilizing technology-based training, it is important for managers to not overemphasize the importance of peripheral parts of training (e.g., entertainment value for employees). Moreover, while utilizing computer-based training, managers should ensure the design of the training is still effective, such as including the proper amount of guidance and feedback for employees, and consequently allowing employees to benefit from the training design but at their own self-paced learning. Last, while utilizing simulation training, which is especially effective for training in situations that are often dangerous, priority should be placed on psychological fidelity over physical fidelity. Physical fidelity refers to how much the simulation appears to physically represent the real world (e.g., colors, shapes, or sizes of objects in simulation look like those in reality) while psychological fidelity refers to the relevance of the content to job performance, such as the degree to which the simulation replicates the scenarios and events to be trained on. For example, scenarios should appear in the same sequence and timing as in reality, allowing employees to practice the same types of reasoning they would utilize in real life scenarios.

Best Practices After Training. Following training, it is essential organizations ensure transfer of training through several potential actions. First, organizations remove obstacles to transfer, such as by giving employees sufficient time and opportunities to implement their new training behaviors. Second, organizations should provide the proper advice and instructions for supervisors. This advice may include giving supervisors the appropriate time and resources to reward employees for implementing what they learned in training, as well as ensuring managers

have the proper knowledge to remind employees about what they learned in training and how to implement it. Third, organizations should encourage managers and employees to debrief on training and its application to the real world. By reflecting on how employees' work tasks are related to training this will help with training retention and allow for greater processing on how to handle future related challenges. Fourth, organizations should consider providing employees with additional measures of support of retention and improved performance, such as access to communities of practice or knowledge repositories.

In addition to ensuring transfer of training, organizations should properly evaluate the training they conducted. Organizations should start by specifying the purpose of their evaluation, such as discerning what they hope to accomplish in their evaluation and then connect each step of their evaluation to that purpose. This ensures a systematic approach toward evaluating whether training produces desired results. Last, organizations must decide what training outcomes they will measure. Possible outcomes include employees' reactions to training, knowledge retained, behavioral changes, and overall performance. Evaluative measures should utilize affective, cognitive, and behavioral indicators to assess training effectiveness.

Transfer of Training. Transfer of training is commonly defined as the successful application of knowledge, skills, and attitudes gained in a training context to the job (Brown & Sitzman, 2011). Despite the importance of transfer, some estimates of transfer in previous literature are as low as 10% (Georgenson, 1982). To help elucidate how to increase transfer, Hughes et al. (2018) created a pithy practitioner-oriented evidence-based guide and checklist for transfer. Similar to Salas et al. (2012), this checklist reviews best practices for before, during and after training to improve training transfer. Best practices from Hughes et al., (2018) and other

published literature will be reviewed to explain how to maximize transfer before, during, and after training.

Pre-training Recommendations for Improving Transfer. Prior to training, organizations must align the training with the organization's distal objectives. This will require conducting a training-needs analysis (TNA) that will elucidate what outcomes (e.g., at the organizational, team, or individual levels) the organization desires (Goldstein & Ford, 2002) what training content will be, and the purposes and goals of the training (Goldstein & Ford, 2002). Helping employees understand the purposes and job relevance of training will facilitate greater motivation, retention, and transfer (Hughes et al., 2018). Next, organizations should foster an environment that is supportive of the training process. For example, organizations should create open lines of communication to support and hear feedback from trainees regarding training (Grossman & Salas, 2011) and encourage employees to set personal goals (Salas et al., 2012). Organizations must also prepare employees to attend training, such as by carefully selecting which employees are qualified for the training, such as by their profession or educational background (Noe, 1986). Meaningful selection of employees will boost employees' motivation toward training (Sankey, 2013), which will further amplify transfer after training (Hughes et al., 2018).

Recommendations for Improving Transfer During Training. Organizations should focus on two fundamental action steps during training to increase transfer of training. These two action steps are maximizing training design for appropriate content and delivery, as well as facilitating psychological capital via training that will increase motivation and learning (Hughes et al., 2018). Pilot testing can be used to maximize training content and delivery, such as testing a training intervention first with a single department. Additionally, training design may be

adjusted to increase transfer such as by building in practice sessions where trainees are encouraged to make errors to learn how to reconcile mistakes and mitigate their negative effects (Keith & Frese, 2008). Practice sessions should be followed by debriefs with individuals and groups so trainees can receive and process feedback on how to further improve (Tannenbaum & Cerasoli, 2013).

To create an employee mindset conducive to motivation and learning, organizations should provide employees with time to discuss the training and how it can be adapted to real-world situations and so employees can ask questions about the application of training (Kazbour et al., 2013). Additionally, employees should be encouraged to see errors as opportunities for learning and growth rather than setbacks (Huang et al., 2015). Relatedly, organizations should facilitate a non-judgmental learning environment, so employees feel comfortable asking for how to improve their performance.

Post-Training Recommendations for Improving Training. There are several crucial steps organizations should take after training to attempt to maximize transfer. For example, organizations should support the use of trained skills through careful planning. This may be done by upholding the policies, procedures, rewards and routines that support the use of trained behaviors in the organizational context (Hughes et al., 2018; Schneider et al., 2013). Organizations should even attempt to reduce employees' normal workload so that employees can focus specifically on applying their training to their usual roles (Holton et al., 2003). Hughes et al. (2018) note that managers should continually communicate with employees following training to provide brief reminders of training, such as demonstrating positive or negative examples of behaviors. This time can also be utilized to allow employees to reflect on and plan for the future application of their training to their work roles. Relatedly, accountability routines,

such as checking in with management and employees to see if training-related goals have been met, should be applied, in addition to refresher training (Hughes et al., 2018).

To maximally benefit from goal setting and feedback in the context of training, organizations should start by encouraging employees to set both short and long-term goals for improved behavior based on their training (Grossman & Salas, 2011). Importantly, employees will require consistent feedback, both on an ongoing basis such as from peers through regular coaching, and more formally, such as through performance appraisal. Providing a consistent judgment-free environment will support employees so they feel comfortable asking questions or expressing concerns (Hughes et al., 2018).

Last, training evaluation should assess both the degree employees' performance improves from training, and the degree such improvements are transferred to employees' work roles (Hughes et la., 2018). Training transfer measures should also correspond to the goals formed based on the original TNA prior to training (Burrow & Berardinelli, 2003). Sections of training that are not producing desired results will become more obvious when comparing to the needs discerned from the original CNS (Arthur et al., 2003). Relatedly, adjustments to training should be made based on training evaluations. However, some results such as improved return on investment (ROI) may take longer to materialize, so having sufficient knowledge to make appropriate adjustments may take longer than realized (De Wit et al., 2012).

Training Items Originally Used by Rynes et al. (2002). In their seminal work, Rynes et al. (2002) used four items to test HR professionals' knowledge of best practices in training. The truth or falseness of each item was supported by one or more studies. Each item used by Rynes et al. (2002) will be reviewed here and supported with more contemporary research supporting the accuracy of each item to validate each item's use in the current study. The first item used by

Rynes et al. (2002) was, “Lecture-based training is superior to all other forms of training delivery for job performance.” Echoing the finding from Gagne & Medsker (1996), which was cited by Rynes et al. (2002), that active forms of learning are typically superiors to passive forms of learning, Lacerenza et al. (2017) found in their meta-analysis that practice-based training designs resulted in greater improvements in leadership compared to more passive information-based training designs. Relatedly, in their meta-analytic review of resuscitation training methods, Mundell et al. (2013) found the more active training intervention known as technology-enhanced simulation-based training was more effective than passive forms of training, such as non-technology enhanced modalities including face to face lectures, computer-based tutorials, or educational videos.

The second training-related true/false item from Rynes et al. (2002) was, “Training job performance is more effective with older adults than younger adults.” Research has consistently shown that age is generally negatively associated with learning outcomes (Colquitt et al., 2000). More recently, in their meta-analytic review of the relationships between organizational training outcomes and age, Davenport et al. (2022) found similar findings. Compared to younger employees, older employees performed more poorly compared to younger trainees following the same training interventions and took more time to complete the same training interventions (Davenport et al, 2022). In their assessment of whether the negative relationship between age and training outcomes was moderated by pace (e.g., self-paced or a set pace) or mode of training (e.g., active vs passive training interventions), Davenport et al. (2022) found no moderating role of either variable.

The third item used by Rynes et al. (2002) was, “The most important factor for how much training employees actually use on their jobs is how much they learned during training.” In their

original study, Rynes et al. (2002) cited a primary study by Tracey et al. (1995), which found that in an organizational setting, training transfer support climate (e.g., the degree to which organizations supported the implementation of said training after its completion) was a stronger predictor of how much training employees utilize on the job compared to how much employee learned (as tested immediately after training) during training. Relatedly, in their meta-analytic review, Colquitt et al. (2000) found individual differences (e.g., cognitive ability) and contextual variables (e.g., social support of training) were stronger predictors of training transfer compared to post-training knowledge. Though the most recent meta-analysis we are aware of (Hughes et al., 2018) that was designed to measure predictors of training transfer did not include post-training knowledge as a predictor, another meta-analysis following the seminal study by Rynes et al. (2002) did include both post-training job knowledge and organizational climate as predictors of transfer. The results were consistent with literature cited by Rynes et al. (2002), which were that training transfer climate was a greater predictor of transfer of training compared to post-training knowledge measured immediately after training (Blume et al., 2010).

The fourth and final item used by Rynes et al. (2002) to assess HR practitioners' knowledge of training research findings was, "Training for simple skills will be more effective if it is presented in one large session than if it is presented in several sessions over time." Contemporary meta-analytic findings replicate findings from the meta-analytic research cited by Rynes et al. (2002), which suggest that training simple skills in a single blocked or massed section is less effective compared to training those same skills in temporally spaced sessions that equal the same amount of time as the massed section (Donovan & Radosevich, 1999). For example, in their meta-analytic review of leadership training interventions, Lacerenza et al. (2017) found that though spaced vs. massed training sessions were not related to post-training

knowledge, spaced training interventions over the course of weeks were related to the transfer of leadership skills from training interventions. The finding that temporally spaced training leads to improved learning outcomes is a consistent finding both within I-O psychology and management and outside of these fields (Brunmair & Richter, 2019).

As noted, substantial research has repeatedly found practitioners are often unaware of published empirical findings from training and development (Rynes et al., 2002; Sanders et al., 2008; Tenhiälä et al., 2014). For instance, in Rynes et al. (2002) seminal work, practitioners only responded correctly to 70.75% of the true/false items included in the current study. In more recent work, Tenhiälä et al. (2014) found similar results for American respondents (71%). However, different from training & development, OHP is an area that overlaps with I-O psychology in which the science/knowledge gap has not yet been systematically evaluated.

Summary of Relevant Findings in Occupational Health Psychology

OHP is a field rife with findings regarding best practices for workers' health and performance outcomes. I will review key empirical findings from OHP followed by items derived from those findings. For the current study being proposed, these items will be distributed to health professionals to gauge their knowledge of published research findings. OHP topics that will be reviewed include work-stress, recovery from work, workplace safety, workplace health promotion programs, telepressure and sleep.

Work-Related Stress. Work stress refers to the process in which individuals react to and manage work-related demands (Griffin & Clarke, 2010). Stressors refer to external stimuli (e.g., an angry customer) perceived of as demanding (Griffin & Clarke, 2010). Examples of work-related stressors are time pressure to complete tasks or a loud working environment (Demerouti et al., 2001). There are several well-supported theories about work stress, including the Job

Demands-Control Model (Karasek, 1979), Conservation of Resources Theory (Hobfoll, 1989), and the Job Demands-Resources (JDR) Model (Demerouti et al., 2001). As an example, according to the JDR model, when workers lack adequate resources to handle the demands they experience, workers experience stress and potentially burnout. Demands may refer to physical (e.g., workload, time pressure), social (e.g., an angry customer), or organizational aspects of a job (e.g., low autonomy) that drain physical or mental effort. Conversely, resources refer to physical (e.g., proper equipment to get work done), social (e.g., support from a supervisor, coworkers, and/or upper management), or organizational aspects of a job (e.g., task variety) that aid in achieving work goals, reduce job demands, or stimulate growth.

Reducing the science-practice gap in the domain of work stress is essential as work stress is directly associated with numerous negative outcomes with examples including sleep disturbance (Deng et al., 2017), gastrointestinal problems (Nixon et a., 2011), depression and anxiety (Poursadeghiyan et al., 2016) and even several types of cancer (Yang et al., 2019). Relatedly, understanding the best interventions to prevent or reduce work stress is also essential. Despite relaxation-oriented interventions (e.g., mindfulness meditation) being implemented more often, cognitive-behavioral interventions (such as Barrett & Stewart, 2021; Richardson & Rothstein, 2008) alleviate strains (i.e., negative outcomes of the stress process) more than relaxation interventions (Tetrick & Winslow, 2015). Cognitive behavioral interventions inform employees about the role their own thoughts and emotions play during stress, as well as how to redirect thoughts and behaviors to better manage stress (Richardson & Rothstein, 2008). Cognitive behavioral interventions appear to be the strongest form of workplace intervention against stress (Richardson & Rothstein, 2008; Van Der Klink et al., 2001). Consequently, a proposed item to test for knowledge of this finding among HR professionals is, “Within

organizations, mindfulness meditation interventions reduce stress more than cognitive behavioral interventions" (False). Moreover, regarding employee stress, Hogan (2007, p. 106) reported 75% of employees list their manager as the most stressful part of their job. To test whether HR practitioners are aware of this finding, I propose the item, "Across occupations, employees perceive their manager as the most stressful part of their job" (True).

Psychological Recovery from Work. In addition to preventing work-stress, organizations should facilitate psychological recovery among workers. Psychological recovery from work is the reduction of physical and psychological strain symptoms resulting from the work stress process (Sonnentag & Fritz, 2015). Recovery in employees is important as it is positively related to many beneficial outcomes for employees including engagement (Sonnentag et al., 2012), next-day morning-vigor (ten Brummelhuis & Trougakos, 2014) and reduced negative affect (Eichberger et al. 2021). Relatedly, the need for recovery is higher when employees have low job autonomy, high job demands, and when they engage in unfavorable off-job activities such as housework or completing work tasks at home (Sonnentag & Zijlstra, 2006). Consequently, managers may help better facilitate recovery by discouraging employees from working beyond regular work hours during leisure time (ten Brummelhuis & Trougakos, 2014), increasing job autonomy (ten Brummelhuis & Trougakos, 2014; Sonnentag & Zijlstra, 2006), reducing work demands (Sonnentag & Zijlstra, 2006) and educating employees on empirically supported facilitators of recovery.

Psychological recovery from work is best facilitated by four types of behaviors: psychological detachment, relaxation, mastery, and autonomy (Sonnentag & Fritz, 2007). Psychological detachment is the degree an individual is disengaged from work tasks and thoughts about work (Sonnentag & Fritz, 2014). Mastery refers to perceived improvement or

competence in endeavors or hobbies outside of work and control refers to the degree of freedom one feels from responsibilities (Sonnentag & Fritz, 2007). In the context of psychological recovery, autonomy refers to having control over what one does during leisure time and how it will be done, while relaxation refers to low sympathetic activation (Sonnentag & Fritz, 2007). Though the distinct recovery experiences of detachment, relaxation, autonomy, and mastery are positively related to one another, detachment and relaxation are recognized as the greatest facilitators of recovery (Sonnentag & Fritz, 2007; Sonnentag & Fritz, 2014). To test for knowledge of this finding, I propose the item, "Psychological detachment from work is important for reducing the negative consequences of work-related stress" (True).

Workplace Safety Behaviors & Accidents. Safety-related outcomes for organizations include safety behaviors (e.g., wearing personal protective equipment [PPE]), accidents and injuries on the job, and risk perceptions (e.g., the perceived risk inherent to one's job or job site) (Zhang et al., 2019). For organizations to prevent accidents and injuries on the job, it is invaluable for managers and safety and health professionals to know the antecedents of such events. As an example, one key predictor of the number of accidents and injuries on the job is safety climate, which in short refers to the measurable aspect of an organization's safety culture (Huang et al, 2013). Stated more concretely, safety climate refers to workers' shared perceptions of their organization's policies & practices that show the degree the organization cares about safety in the workplace (Huang et al., 2013). A safety climate in which employees perceive an organization as caring about safety is consistently associated with higher safety behaviors and lower accidents and injuries (Zhang et al., 2019).

Conversely, active hazards are also positively associated with negative workplace safety outcomes such as injuries (Melamed et al., 1999; Tomás et al., 1999). Additionally, Melamed et

al. (1999) found overcrowding, need for sustained attention in a job, physical effort, and climate discomfort predicted higher rates of injuries. Other contextual characteristics such as poor lighting or vibrations are relatively less important in predicting accidents (Melamed et al., 1999). Antecedents to injuries occurring in unsafe working conditions include workers' perceiving pressure, such as pressure to meet a deadline, and reduced perceptions of control (Kaplan & Tetrick, 2011). To test for knowledge of the finding that pressure to meet deadlines is associated with increased injuries, I propose the item, "Workplace accidents are more likely when employees feel pressure to meet deadlines." (True).

In addition to workplace characteristics, there are also individual differences that are common antecedents of workplace safety outcomes. For example, in their meta-analysis on big-five personality traits as potential antecedents of workplace injuries, Beus et al. (2015) found conscientiousness and agreeableness were negatively associated with unsafe behaviors and extraversion and neuroticism were positively associated with unsafe behaviors. Beus et al. (2015) also found that safety-related behaviors partially mediated the associations between big-five personality traits and workplace accidents, and that agreeableness accounted for the largest amount of variability in safety behaviors. To investigate whether HR practitioners are aware of this finding, I propose the item, "The personality trait known as agreeableness (e.g., being cooperative) is associated with performing more safety behaviors in the workplace" (True).

Last, in some cases organizations provide bonuses to employees for not having workplace injuries. However, this practice risks incentivizing *underreporting* of genuine injuries, rather than reducing injuries or injury rates (Leigh et al., 2004; Fell-Carlson, 2004). Instead, organizations should incentivize engaging in behaviors that help prevent accidents or injuries, such as employees consistently wearing personal protective equipment (PPE) on the job. This is

especially important given that safety climate is more strongly associated with safety outcomes than individual difference variables such as big-five personality traits (Beus et al., 2015). To test HR practitioners' awareness of the finding that incentivizing reduced workplace accidents may accidentally indirectly incentivize underreporting of accidents, I propose the item, "To reduce workplace accidents, organizations should offer employees bonuses for reduced workplace accidents." (False).

Workplace Health Promotion Programs. According to the World Health Organization (WHO), significant improvement on health in the 21st century may come from within the workplace, such as through workplace health promotion programs (WHPP) ("Workplace Health Promotion," 2019). WHPPs refer to efforts made by organizations to help facilitate improved or sustained employee health, such as through free smoking cessation programs, blood pressure tests, or exercise equipment on-site (Robroek et al., 2009). Benefits from WHPPs include beneficial health outcomes for employees such as improvement in exercise frequency, weight loss, smoking cessation, blood pressure, and cholesterol (Anger et al., 2015). WHPPs consistently provide financial benefits for organizations by reducing absenteeism and healthcare costs of employees (Goetzel et al., 2014). Baicker et al. (2010) found a reduction of $3.27 in medical care costs and a $2.73 reduction in absenteeism costs for every dollar spent on WHPPs. Despite such benefits, only about half (46%) of organizations implement a WHPP of some kind (Integrated Benefits Institute, 2022). To test for knowledge of this finding, I propose the item, "More than 75% of organizations offer some form or type of workplace health promotion programs to employees" (True).

There are many antecedents of participation in WHPPs as well as many barriers. For example, self-efficacy regarding exercise or health-activity goal setting (Rongen et al., 2014;

Schopp et al., 2015) and workplace social support (Jørgensen et al., 2016; Middlestadt et al., 2011) are common predictors of participation. Conversely, barriers to participation include more dependents in the home (Abraham et al., 2015), distance from the location of the WHPP (e.g., remote workers, or workers who live far from a gym that an organization provides vouchers for) (Donaldson-Feilder et al., 2017), and lack of time to participate during the workday (Donaldson-Feilder et al., 2017).

Despite published findings on the antecedents of, and barriers against, participation in WHPPs typically less than half of employees with a WHPP available to them utilize it, with the most common range of participation being 20-30% (Robroek et al., 2009). In a more recent survey, less than 40% of employees with a WHPP available to them utilize it (Nauen, 2017). Results of this survey align with a more recent cross-company study by Lier et al. (2019) finding only about 15% of employees participate in workplace health promotion programs. To test for knowledge of these findings, I propose the item, "When employees have a free workplace health promotion program available to them, typically less than a third use it" (True).

When organizations do implement WHPPs, only 23% collect data on employee outcomes to gauge whether the WHPP is effective (Integrated Benefits Institute, 2022). To gauge HR practitioners' knowledge of this finding, I propose the item, "Most organizations that use a workplace health promotion program systematically evaluate their program's results." (False).

Telepressure. Telepressure refers to thinking about workplace information & communication technology (ICT) such as email, voicemail or text messages and feeling compelled to quickly respond to such communication (Barber & Santuzzi, 2015). It is a construct distinct from workaholism and engagement (Barber & Santuzzi, 2015). Barber and Santuzzi (2015) were the first to systematically examine the construct of telepressure per say while

creating their telepressure scale. Results provided evidence of construct validity for telepressure as having a single-factor structure. In Study 1, they examined potential antecedents of telepressure and found public self-consciousness (e.g., concern with making good impressions on others), and response expectations (e.g., the perception others expect one to respond to their work messages outside of work hours) and techno-overload (e.g., the perception employees have that they are required to be more productive and faster when seeing the technology they use in their environment) were positively related to telepressure. In Study 2, they used confirmatory factor analysis (CFA) and found that personal (job involvement and affective commitment) and work environment (general and ICT work demands) factors were distinct from workplace telepressure.

Though asynchronous messaging may increase flexibility in timing of responding for workers doing their work tasks, the common simultaneous experience of telepressure (e.g., the need to respond to supervisors or peers immediately) has been referred to as the autonomy paradox (Mazmanian et al., 2013). In fact, in their seminal work on telepressure, Barber and Santuzzi (2015) found that workplace telepressure was associated with several criterion variables including physical and cognitive burnout, absenteeism, and reduced sleep quality. These relationships may be due to telepressure being associated with reduced detachment from work, which is a key component of recovery from work (Sonnentag & Fritz, 2007). To test HR practitioners' knowledge of these findings, I propose the item, "Thinking about workplace communications (e.g., thinking about responding to emails or texts about work) during non-work hours is associated with improved sleep quality" (False).

Shift Work And Sleep. Shift work refers to work shifts done outside of conventional working hours to extend the hours of operationalization for an organization (Åkerstedt (1990).

Shift work is recognized as a common cause of insufficient sleep, largely due to shift work typically occurring outside regular sleep hours (Barnes & Watson, 2019). Broadly defined, sleep is the transient reduction of perception of one's environment, which is generally considered a reduction in consciousness (Carskadon & Rechtschaffen, 2011). However, sleep is commonly recognized as having two subcomponents, which are sleep quantity and sleep quality (Crain et al., 2018). Sleep quantity refers to the quantity of time spent asleep. By contrast, sleep quality refers to several of its own subcomponents including how quickly one falls asleep, whether sleep is maintained throughout the night or segmented, and the degree one feels rested or restored following sleep. Shift work is associated with both reduced sleep quality and sleep quantity (Geiger-Brown et al., 2011; McDowall et al., 2017).

However, shift work is associated with many other negative outcomes in addition to its influence on sleep. In their meta-analytic review, Wang et al. (2018) found shift work was associated with increased cardiovascular disease morbidity and mortality. To test for health professionals' knowledge of the relationship between shift work and cardiovascular disease, I propose the item, "Shift work is not associated with workers' long-term health outcomes" (False).

Similar to shift work, impaired sleep is also associated with many outcomes. For instance, sleep is positively related to job satisfaction, organizational citizenship behaviors (OCB) and employees' ratings of leaders' effectiveness (Barnes et al., 2013; Barnes & Guarana, 2016). Impaired sleep, by contrast, is associated with numerous negative outcomes such as hypertension, cardiovascular disease, and coronary heart disease (Itani et al., 2017). Experimental studies have also found that impaired sleep has a negative effect on mood (Covassin & Singh, 2016). Impaired sleep is also associated with higher absenteeism and

presenteeism, reduced productivity, and increased accidents on the job (Barnes & Watson, 2019; Hillman et al., 2018).

Impaired sleep is also associated with unethical behavior (e.g., deceiving a coworker) (Welsh et al., 2018; Welsh et al., 2014). Researchers disagree on the exact causes of unethical workplace behaviors, including on whether some causes (e.g., ego depletion) exist (Baumeister et al., 1998; Evans et al., 2016; Vohs et al., 2011; Friese et al., 2019). Perhaps the most balanced perspective comes from Evans et al. (2016), who posited that lapses in self-regulation (e.g., unethical behavior such as lying to a coworker) have different causes. One of these causes is referred to as a depleted limited resource, an idea often referred to as the strength model of self-regulation or the ego-depletion model, and other causes may be psychological (e.g., reduced motivation to continue to act ethically) or physiological (e.g., depleted energy resources). Whatever the exact causes for unethical behavior at work are though, there is clear evidence that impaired sleep is associated with unethical behavior (e.g., deceiving a coworker) (Welsh et al., 2018; Welsh et al., 2014). To test for knowledge of this finding, I propose the item, "Well-rested workers are equally as likely as sleep-impaired workers to engage in unethical behavior, such as taking credit for others' work." (False).

As noted, substantial research has repeatedly found practitioners are often unaware of published empirical findings from across I-O psychology (e.g., selection, training & development, management, and compensation & benefits) (Rynes et al., 2002; Sanders et al., 2008; Tenhiälä et al., 2014; Fisher et al., 2020). As a summary statistic from Rynes et al. (2002), the average practitioner only answered 57% of I-O psychology/management items correctly. These findings are also cross-cultural as research has found the similar results in Dutch (Sanders et al., 2008) participants. Moreover, Tenhiälä et al., 2014 found similar results for Finnish, South

Korean, Spanish, and Australian respondents. More recently in a sample of both U.S. and Canadian respondents, Fisher et al. (2020) found the science/knowledge gap in selection was larger relative to findings from Rynes et al. (2002). Though I have not found research on the science/knowledge gap in OHP, there is at least minimal research on the science/knowledge gap within the topic of organizational feedback.

Summary of Relevant Findings in Organizational Feedback

As Johnson et al. (2022) noted, practice at a task and feedback combined 'make perfect' rather than practice at a task alone. In their meta-analysis on feedback interventions on performance, Kluger & DeNisi (1996) found that despite some feedback interventions being associated with reduced performance, the average effect of feedback interventions on performance was $d = .41$. In their study, Kluger and DeNisi (1996) referred to a feedback intervention as external agents, such as supervisors, taking action to provide information regarding employees' task performance. Within the literature, there are differing perspectives on whether feedback is an antecedent to subsequent improved performance or a reinforcer that follows effective performance (Alvero et al., 2008). Feedback is also a fundamental concept within industrial/organizational psychology, helping to explain key variables such as job satisfaction and motivation (Hackman & Oldham, 1975; Campion & Lord, 1982).

Employees also receive different types of feedback. For instance, performance appraisal refers to the formal process in which a supervisor evaluates an employee's performance in dimensions relevant to the employee's assigned work tasks and then typically shares the results with said employee (DeNisi & Murphy, 2017). While feedback from performance appraisal is a more formal type of feedback, employees also commonly receive informal feedback that occurs without any formal appraisal (Kang et al., 2005; So et al., 2013). In the subsequent sections, I

will discuss employee characteristics associated with different responses to feedback, managerial characteristics and contextual factors that may influence feedback and best practices for giving feedback.

Employee Characteristics Associated with Different Responses to Feedback. In their comprehensive review of studies on the effects of feedback, Kluger & Denisi (1996) found that feedback only leads to improved performance in about 1/3 of cases, has no discernable effect in another 1/3 of cases, and is related to reductions in performance in the remaining 1/3 of cases. However, according to longitudinal research, employees do generally exhibit greater behavioral change following feedback during their early tenure at a job compared to later (Reilly et al., 1996). To test for knowledge of this finding, I propose the item, "Feedback typically facilitates greater behavioral change in less-experienced employees compared to more experienced employees" (True).

However, in addition to improved performance, supervisors should also aim for positive reactions among employees receiving performance feedback. Employee reactions may refer to employees' reactions to the appraisal process itself or to the feedback/ratings employees received during the appraisal process (Cawley et al., 1998). Reactions may include general satisfaction, perceptions of fairness, perceived utility, or the motivation to consequently improve performance (Cawley et al., 1998). Despite the potential for employees to have positive reactions to feedback, giving feedback has been recognized in the published literature as notoriously difficult due to employees' commonly negative reactions to corrective feedback (Murphy, 2019).

One reason for employees' commonly negative reactions is that employees tend to perceive their performance level as higher compared to how supervisors or peers do (Campbell et al. 1998; Meyer; 1980). When employees perceive their performance ratings as lower than

deserved, they are more likely to dismiss such ratings as inaccurate (Murphy, 2019). In worse cases, employees react with cynicism and disengage, which Murphy et al. (2019) have referred to as the "death spiral" of performance appraisal systems. Though employees espouse wanting feedback, most actually choose jobs where their performance would not be rated compared to the same job with performance ratings (Barankay, 2011). Additionally, there is clear empirical evidence that despite likely needing feedback the most, lower-performing employees have the most negative reactions to performance feedback (Moss et al., 2004). To test HR practitioners' knowledge of lower performing employees' typically negative reactions to performance feedback, I propose the item, "Lower-performing employees tend to avoid feedback more than higher performing employees do" (True).

Manager Characteristics and Contextual Factors Influencing Feedback. Despite employees' commonly negative reactions to performance appraisal feedback, empirical findings are consistently clear that managers and supervisors most commonly have a leniency bias in which they rate employees' performance as higher than deserved (Pulakos et al. 2011). Freeman & Taylor, (1950) regarded leniency bias as the most obvious error raters make while evaluating performance and leniency bias is still recognized as an "intractable problem" in the field (Pulakos et al., 2011). To test for knowledge of this finding, I propose the item, "Managers rating employees' job performance too leniently is rare" (False).

Managers in fact have several reasons to give inaccurate ratings, whether purposely or due to underlying biases. As mentioned, managers are generally overly lenient in their ratings. This may be due to managers' desire to avoid hurting employees' feelings or conflict, for political purposes (e.g., to make themselves look like better managers), or even to promote an employee out of the department (Johnson et al., 2022; Spence & Keeping, 2011). However,

managers may also have reasons to avoid giving negative feedback. For example, managers may fear that employees will consequently expect rewards from their high ratings that they will not receive (London, 2003). Consequently, managers have a myriad of reasons to give inaccurate feedback. To test for knowledge of these potential influences on giving accurate feedback, I propose the item, "Managers rarely ever distort performance feedback they give to employees" (False).

Best Practices for Giving Feedback. Despite managers' leniency bias, there are nonetheless some broadly recognized best practices for giving feedback within the fields of I-O psychology and management. I will review these best practices next while proposing corresponding items intended to test HR practitioners' knowledge of said findings. It is important to note that some of the items derived from the literature in this section are technically more related to appraisal but are included because they provide relevant contextual information managers may or may not be aware of when considering the topic of feedback.

Regarding best practices in giving feedback, managers should focus feedback on specific behaviors rather than the employee (Kluger & DeNisi, 1996). In addition to being clearer and more direct, such feedback is also more likely to be interpreted as directed at skills or specific actions rather than at the individual, which may threaten the employees' self-concept (Kluger & DeNisi, 1996). To test HR practitioners' awareness of this finding, I propose the item, "To improve employees' reactions to feedback, performance feedback should focus on employee's behavior rather than their personality" (True). Relatedly, when focused on behavior, feedback should be as specific as possible, as prior research has consistently found that feedback specificity is associated with greater feedback acceptance by employees (Ilgen et al., 1979; Moon, 2019). For example, rather than letting an employee know their interpersonal behaviors

could improve, feedback givers should focus on specific interpersonal behaviors to improve on, such as active listening or being more assertive in negotiations at work. Specific feedback is likely more efficacious because it gives ratees more information that they can form their behavioral change goals around (Langeland et al., 1998). To test for knowledge of this research, I propose the item, "Generally, feedback is better when it is broader rather than specific" (False).

Feedback is also best given in the context of a coaching relationship with the ratee, including behaviors such as the manager following up with the employee over time to continually coach the employee on how to improve knowledge and skills in a non-evaluative setting, and specific information in evaluative settings on how the employee can improve their performance in light of feedback given (Aguinis et al., 2011; Aguinis et al., 2012; DeNisi & Kluger, 2000; Murphy, 2019). To test for knowledge of these findings, I propose the item, "The more a manager assumes the role of a coach, such as helping an employee with professional development, the more positively an employee responds to feedback" (True).

Several studies have investigated whether feedback combinations, such as a "feedback sandwich," which starts with one positive comment, a negative comment, and another positive comment, improve the performance of employees more. The consensus on this research is that such feedback combinations do not improve performance any more than negative feedback delivered alone (Johnson et al., 2022). Whether feedback combinations influence employee reactions to feedback is still an inquiry for future research. To test whether practitioners are aware of empirical findings regarding the potential effects of "feedback" sandwiching on performance, I propose the item, "Though sandwiching negative feedback between two pieces of positive feedback may improve employee reactions to feedback, there isn't clear evidence it improve actual performance" (True).

Based on their review of literature on feedback, Johnson et al. (2022) made several general recommendations regarding the delivery of feedback. For instance, feedback should be frequent, as prior research has shown more frequent feedback, such as informal feedback, improves performance more (Kang et al., 2005; So et al., 2013). To test for knowledge of this finding, I propose the item, "More frequent feedback is associated with greater employee performance improvements" (True). However, more frequent feedback is also associated with greater employee acceptance of feedback.

In their meta-analytic review, Pichler et al. (2020) also reported that feedback frequency has a moderate positive relationship with employee acceptance of feedback. This is consistent with the theory from literature (Ilgen, 1979). Pichler et al. (2020) found that the relationship between feedback frequency and employee reactions to feedback was stronger when feedback was more positive, which may hint at why frequent feedback is associated with more acceptance by employees. Pichler et al. (2020) stated that it may be that more frequent feedback may help improve employees' performance over time, leading to more positive evaluations and consequently more positive reactions to those evaluations. Or the relationship between frequent feedback and positive employee reactions may be due to employees having greater knowledge of performance standards or because employees are less surprised by negative feedback they receive during performance appraisals (Pichler et al., 2020). Regardless of the explanation, frequent feedback is associated with more positive reactions by employees. To test for knowledge of this finding, I propose the item, "Employees tend to respond more positively to feedback if it is less frequent" (False).

Regarding the context in which employees receive feedback through performance appraisals, Pichler et al. (2020) have reported several key findings. First, employees have more

favorable reactions to feedback on their performance when they have input on how the appraisal process is conducted. This is likely due to employees perceiving greater procedural justice in the appraisal process when they were able to influence the decision-making behind how the appraisal was conducted (Greenberg, 1987; Pichler et al., 2020). To test managers' awareness of these findings, I propose the item, "Employees have more positive reactions to performance feedback when they have a say in how their performance is evaluated" (True). Additionally, the relationship quality between the rater and ratee is a greater predictor of employee reactions than the predictor of rating favorability (e.g., how highly the ratee's performance was rated). To test for knowledge of this finding, I propose the item, "Workers' reactions to feedback are more influenced by how good of a relationship they have with their manager than the feedback (e.g., positive or negative) itself" (True).

Under the topic of "general employment practices," which consisted of 75% items relating to perceptions of job performance (Rynes et al., 2002), substantial research has found that practitioners are often uninformed of published research findings. For instance, Rynes et al. (2002) found that practitioners only responded correctly to "general employment practices" true/false items 67.67% of the time. Tenhiälä et al. (2014) found U.S. practitioners responded correctly to a strikingly similar percent (68%) when responding to identical items specifically testing knowledge of general employment practices. Similar results have been found in other studies testing the science/knowledge gap in "general employment practices" including samples from Europe (Sanders et al., 2008; Tenhiälä et al., 2014), Australia (Tenhiälä et al., 2014), and South Korea (Tenhiälä et al., 2014).

Hypotheses

Although there is an appreciable science/knowledge gap for practitioners, I predicted that academic participants in the current study would have a comparatively smaller knowledge/practice gap than practitioner participants. The main reason for this prediction was that I anticipated academic participants would have more formal education compared to the practitioner sample. The benefits of education for knowledge attainment and retainment will be discussed shortly. However, even in cases where practitioners have doctoral training in I-O psychology, I predicted academic participants would still have more knowledge of I-O psychology findings. The explanation for this prediction will be discussed more thoroughly later on as I anticipated academic respondents will more regularly rehearse/review published I-O psychology findings, such as through research and teaching. As noted however, the primary reason I predicted academic respondents would answer more true/false items correctly in the current study was due their higher level of education.

Research has shown that higher education in a topic area is associated with increased learning and more accurate reasoning about material from that topic area. For instance, in their longitudinal study, Lehman & Nisbett (1990) found that undergraduate psychology majors significantly improved in their statistical and methodological reasoning from year one of their undergraduate training to year four. The same magnitude of improvement was not found for undergraduate humanities or natural science majors in the study. The authors also found a correlation between number of statistics courses taken during undergraduate training and improved performance in statistical reasoning, suggesting an association between statistical coursework and improved statistical reasoning.

In another study involving psychology graduate students, Lehman et al. (1998) found similar results in both their longitudinal and cross-sectional study. In their cross-sectional study, third-year psychology graduate students substantially outperformed first-year psychology graduate students in an assessment of statistical and methodological reasoning. In their longitudinal study, the first-year students from first study completed the same statistical and methodological reasoning assessment in their third year and showed substantial improvements. Lehman et al. (1998) suggested the improvements were likely due to the learning of probabilistic and statistical rules psychology students learn through their coursework.

There are several reasons why coursework alone, even without completing a degree, may result in learning in a content area, two of which I will focus on here. First, different from passively reading new information, being tested and required to recall information by memory is associated with increased learning and referred to as 'the testing effect' (Rowland et al., 2014). Consequently, students in higher education courses are likely to learn more than those who have not taken said courses. This is not only due to higher education students' likely-increased exposure to new ideas, but also because students in formal education are frequently required to recall newly learned material through quizzes or exams. Second, formal coursework commonly requires students to recall information they have learned over time (e.g., through quizzes and/or exams, as well as a final exam at the conclusion of the semester). This also increases learning as research has shown that the 'testing effect' is optimized when students are required to recall information over longer time intervals rather than 'cramming' recall practice into a single block of time (Latimier et al., 2021). Based on this research, Hypotheses1-6 were as follows:

Hypothesis 1: Academic respondents will correctly respond to a greater percentage of true/false training & development items compared to practitioner respondents.

Hypothesis 2: Academic respondents will correctly respond to a greater percentage of true/false OHP items compared to practitioner respondents.

Hypothesis 3: Academic respondents will correctly respond to a greater percentage of true/false performance feedback items compared to practitioner respondents.

Hypothesis 4: Practitioners with prior I-O psychology coursework (e.g., at least one undergraduate or graduate level course in performance management or organizational training) will answer a greater percentage of true/false performance feedback items correctly compared to practitioners who did not complete formal coursework on the topic.

Hypothesis 5: Practitioners with prior OHP coursework (e.g., at least one OHP undergraduate or graduate level course) will respond to a greater percentage of OHP true/false items correctly compared to practitioner respondents without prior OHP coursework.

Hypothesis 6: Academic respondents with a specialty concentration in OHP within their broader degree (e.g., I-O psychology) will answer a greater percentage of OHP true/false items correctly compared to academic respondents without an OHP concentration.

Exploratory Research Questions

Last, I asked demographic questions to participants to examine whether these demographic variables, such as self-perceived expertise, were associated with correct responding to true/false items in the current study. Because these variables have not been studied in the context of the science/knowledge gap, these questions were considered exploratory research questions. The complete list of exploratory research questions is listed in the Appendix.

CHAPTER 2: METHOD

Participants

A total of 218 (94 male, 121 female 3 preferred not to disclose) respondents participated, consisting of 110 academics and 108 practitioners. Most participants were middle aged (M = 40.90; SD = 10.91) with ages ranging from 24 to 79. All academics earned a PhD or PsyD in psychology (with an emphasis in I-O psychology), Management (with expertise in Human Resource Management) or another field, with the requirement that they must have had previous training in I-O psychology. All participants in both academic and practitioner groups also currently worked part or full-time. Participants in the practitioner sample consisted of HR managers and above (e.g., director, assistant or associate director, vice president or senior vice president), health professionals, and organizational consultants. Additional details regarding participants' demographics are included Table 1 below There were a total of 11,694 survey responses initiated with 98.01% of data being discarded due to data being flagged by Qualtrics as likely to be a bot or fraudulent (e.g., the same individual repeatedly taking the same survey).

Procedure

An invitation to the survey was emailed to 100 I-O trained academics via faculty emails found on each I-O psychology or management program's webpage. The same invitation was sent via direct message on LinkedIn to 100 practitioners. One week later I sent reminder emails to the same email addresses/LinkedIn inboxes, as well as another 100 survey email invitations to new potential academic respondents and 100 survey invitations to new potential practitioner respondents on LinkedIn. On the third week, I sent reminders to those previously emailed/messaged, as well as 200 email invitations to new potential academic respondents and 100 LinkedIn message invitations to new potential practitioner respondents. Initial survey

responses were disproportionately higher among practitioners, hence why fewer (100) subsequent invitations were sent to practitioners compared to the number (200) sent to academics in week 3. Half-way through week 3, I closed data collection with 218 participants given my original target sample was 230 and I did not want to exceed this target in order to have sufficient resources for compensating participants.

Participants were also recruited via a post on LinkedIn and an email listserv (the APA OHPLISTSERV). All participants were also asked to forward the survey to colleagues both in the original invitation message and at the end of the survey. Because I did not record which survey respondents were invited via direct message versus other means (e.g., receiving a forward from a colleague, seeing the recruitment post on LinkedIn, etc.), it is difficult to calculate a response rate for this survey. Both the academic group and practitioner group completed the survey online via Qualtrics. Following participation, participants received a $20 gift card of their choice for either Amazon.com or Starbucks.

Table 1

Demographic Characteristics of the Total Study Sample *(n* = 218)

Variable	Categories	Frequency/Percentage (%)
Gender	Male	94 (43.7%)
	Female	121 (55%)
	Prefer not to say	3 (1.3%)
Age	18 to 24 years	1 (.4%)
	25 to 29 years	22 (9.6%)
	30 to 34 years	50 (21.8%)
	35 to 39 years	54 (23.6%)
	40 to 44 years	22 (9.6%)
	45 to 49 years	19 (8.3%)
	50 to 54 years	20 (8.7%)
	55 to 59 years	17 (7.4%)
	60 to 64 years	9 (3.9%)
	65 years or older	5 (2.0%)

Ethnicity	Hispanic or Latino	14 (6.1%)
	Not Hispanic or Latino	201 (89.5%)
	Prefer not to disclose	3 (1.3%)
Race	American Indian or Alaska Native	3 (1.3%)
	Asian	24 (10.5%)
	Black or African American	20 (8.7%)
	Native Hawaiian or Other Pacific	1 (.4%)
	Islander	167 (72.8%)
	White	14 (6.1%)
	Prefer not to disclose	
Primary occupation	Faculty in psychology department	94 (41%)
	Faculty in management department	17 (7.4%)
	Faculty in other department	10 (4.4%)
	Manager in an organization	50 (21.8%)
	Consulting	58 (25.3%)
Highest degree earned	Bachelors	25 (10.9%)
	Master of arts	25 (10.9%)
	Master of science	20 (8.7%)
	PhD	152 (66.4%)
	PsyD	3 (1.3%)
	Other	4 (1.7%)
Subject of degree	I-O psychology	164 (72.1%)
	Psychology	21 (10%)
	Human resources	10 (4.8%)
	Management	11 (5.2%)
	Other	12 (7.9%)
OHP concentration	Yes	68 (32.3%)
	No	150 (67.7%)
OHP courses taken	Zero	83 (38.9%)
	One	72 (31.4%)
	Two	21 (11.4%)
	Three or more	42 (18.3%)
Training courses taken	Zero	42 (18.3%)
	One	91 (41.9%)
	Two	47 (23.1%)
	Three or more	38 (16.6%)

Performance management classes taken	Zero	50 (21.8%)
	One	108 (47.2%)
	Two	46 (20.1%)
	Three or more	25 (10.9%)

Measures

Development of Measures. The four true/false training & development items used in the current study were adaptations of items developed by Rynes et al. (2002), who constructed content-relevant research items based on areas of their own expertise and relevant research citations from research-oriented textbooks. To ensure the true/false training & development items from Rynes et al. (2002) were still appropriate for use in 2023 considering new scientific findings, contemporary research, particularly meta-analyses, from the last 10 years was reviewed. Training & development items used by Rynes et al. (2002) appeared appropriate for contemporary use considering recent published findings. Performance feedback and OHP items in the current study were constructed based on peer-reviewed meta-analyses published in the last decade to ensure items were derived from cumulative findings and consistent with current knowledge in each topic area.

After generating items, I requested qualitative feedback from two doctoral candidates and one Ph.D. in industrial/organizational psychology for items from all three (training & development, OHP, and performance feedback) topic areas to ensure items were consistent with contemporary findings, as well as clear and concise. Items were further refined for clarity and conciseness based on feedback received. Items from all three topic areas were then sent to subject matter experts (SME) in phase 1a of the broader research project (See Figure 1 below) for ratings on the degree that items were consistent with current research findings, important for

HR/organizational practice, and useful for managers/supervisors, using 5-point Likert-type response scales. This step was labeled phase 1a of this broader research project. Figure 1 shows additional phases. SMEs were also asked for qualitative feedback on how each item might be reworded to make it clearer or more useful, as well as a chance to give any other additional feedback for each item in case SMEs had any broader feedback to give. Qualitative feedback from SMEs was used to revise items to make them clearer and more concise.

All items that had insufficient validity in phase 1a of the broader research project (see Figure 1) went through phase 1b of the current project. Phase 1b consisted of sending items to I-O psychology graduate students with training in OHP for qualitative feedback on how items may be improved. Using this feedback, I revised items for greater clarity. For the last part of phase 1b, cognitive interviews were conducted with two full-time practitioners to collect additional feedback on how items were being interpreted by practitioners per say. This feedback was used to further refine items for clarity and conciseness.

Items That Assessed Knowledge of Published Findings. There were four true/false training & development items, 12 true/false performance feedback items, and 12 true/false OHP items that were used in the current study to assess knowledge of published research findings from I-O psychology. Response options included "*Definitely false*," "*Likely false," "Likely true,"* "*Definitely true*" and, "*Unsure*" (see Appendix).

Items That Assessed How Respondents Attain Information. To assess how often respondents read different information sources, the item, "*How often do you read from the list of information sources listed below*?" was included in the survey, listing information sources from Rynes et al. (2002) including, *Human Resource Magazine*, *Wall Street Journal*, *HR Focus*, *Human Resource Executive*, *Human Resource Management Journal*, *Workforce*, *Business Week*,

Fortune, *Forbes*, *Harvard Business Review*, *Human Resource Planning Journal Inc.*, *Fast Company*, *Personnel Psychology*, *Journal of Applied Psychology*, *Academy of Management Executive*, and, *Academy of Management Journal*, using a 5-point Likert type scale with the following response options of "1 = *never*," "2 = *rarely*," "3 = *sometimes*," "4 = *usually" and "*5 = *always.*" This item derives from the seminal work of Rynes et al. (2002).

To assess where respondents go to for help with solving HR or OHP problems, the item "*How often do you go to the sources listed below for help with HR problems?*" was included in the survey, listing sources including "*Other HR Professionals in My Organization*," "*SHRM Web site*," "*Other Web Sites*," "*HR Research Literature*," "*HR Professionals in Other Organizations*," "*Consultants*," and, "*Academics*" using a 5-point Likert type scale with the response options of "1 = *never*," "2 = *rarely*," "3 = *sometimes*," "4 = *usually" and "*5 = *always.*" This item also derives from the seminal work of Rynes et al. (2002).

Items That Assessed Self-Perceived Expertise. To assess self-perceived expertise in each domain (e.g., training & development, performance feedback, OHP) I adapted and used the six items composing the "objective expertise" subscale from Germain & Tejeda (2012). An example item was, "*I have been trained in performance management*" and response options ranged from, "1 = *Strongly disagree*," to "5 = *Strongly agree.*" Germain & Terjeda (2012) reported an alpha value of .91 for the internal consistency of this subscale. In the current study internal consistency for this subscale was also high when adapted to measure self-perceived expertise in training & development ($\alpha = .86$), performance management ($\alpha = .85$), and OHP ($\alpha = .95$).

Items That Assessed Attitudes Toward Knowledge Sources. To assess respondents' attitudes toward academics and HR research, respondents were asked to indicate the degree they

agree with each of the following items including, "*I wish I had more time to read about academic HR research findings," "Most research findings make sense in theory, but don't work well in practice," "I would like to spend more time talking with academics about HR problems," "I generally don't find academic HR research to be useful,"* and, "*I often wish I could call an academic to help me solve HR problems*," using a 5-point Likert type scale consisting of the following responses, "1 = *rarely or never*," "2 = *a few times a year*," "3 = *about once a month*," "4 = *several times per month" and "*5 = *almost daily*" (Rynes et al. 2002). These items used to assess respondents' attitudes toward academics and HR research derives from the seminal work of Rynes et al. (2002).

Items That Assessed Participant Characteristics for Additional Hypotheses. The first individual difference variable both academic and practitioner respondents were asked about was whether respondents have formal course work in each topic area (e.g., training & development, OHP, and performance feedback). Items included, "*have you ever taken any formal courses on any of the following topics? Training & development? (Yes/No) Occupational health psychology? (Yes/No), Performance feedback? (Yes/No)*," as well as, "*how many courses have you taken in this topic area and what year?*" if participants respond in the affirmative to the first question. Other items include, "*what is the highest degree you have earned?*" (*Bachelors/MA/MS/PhD/PsyD/Other*), "*what was your major?*" (*Industrial/Organizational Psychology/Psychology/Human Resources/Management/Other, Please Specify*), and "*did your degree have an OHP concentration?*" (*Yes/No*).

The second individual difference variable measured was how long it has been since respondents completed their higher education to assess the degree years since formal education completion is associated with greater or fewer correct responses to true/false items.

Qualitative Item Used to Assess Perceived Boundaries. To assess whether participants perceive of boundaries to gaining knowledge (e.g., lack of access to academic journals, etc.), respondents were invited to provide an open response to the item, "What challenges if any do you experience with keeping up with research in your field?"

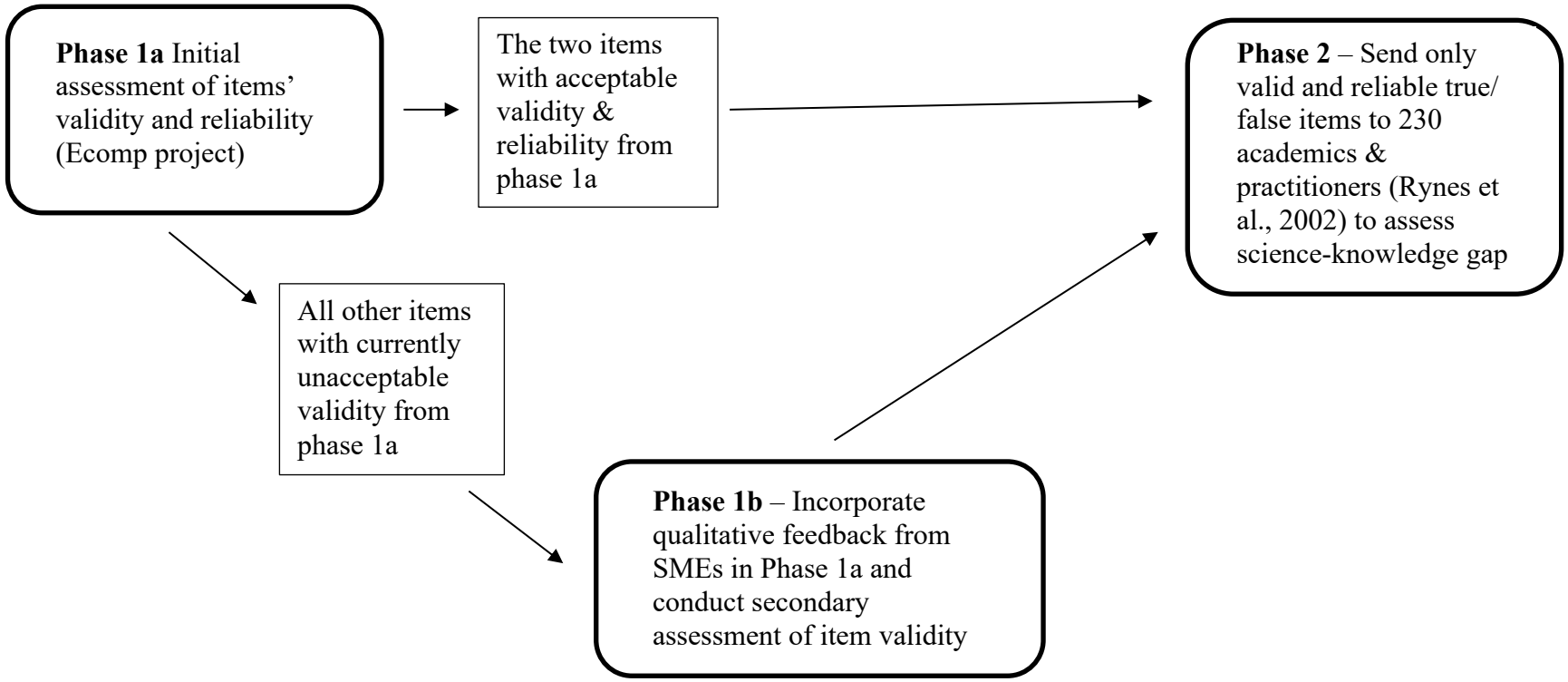

Figure 1. Overview of Broader Research Project

CHAPTER 3: RESULTS

Data Cleaning

I used IBM SPSS 18 to clean and analyze data. The first step was to review and clean the data. I began by reviewing the dataset to evaluate the extent to which survey responses appeared to be valid (from humans meeting study criteria) vs. bots or scam responses presumably provided to earn gift cards. This process is summarized below and depicted in Figure 2. For two methods used to detect invalid responses, I excluded participants according to a strict rule. I excluded participants automatically for either failing two or more of the three attention checks included in the survey and/or completing the survey in less than 4 minutes. I chose a survey completion time of less than 4 minutes as a cutoff for exclusion because there were a total of 102 items in the survey for the current survey. Using a conservative lower estimate of 2 seconds of response time for each item (Huang et al., 2012), respondents would need 3.5 minutes to respond to items alone. Reading the 11 prompts for how to respond to items throughout the would likely require at least 30 seconds, totaling a 4-minute minimum response time for the survey. The average response time of participants retained in the final sample was 13.6 minutes and the median response time was 13.1 minutes. Remaining respondents were classified as either likely-valid if their ReCaptcha score provided by the Qualtrics survey software was .5 or greater, or likely-invalid if their Q_ReCaptcha score was < .05. Q_ReCaptcha was created by Google and is an invisible ReCaptcha method that detects bots by assessing cursor movement on the screen. Q_ReCaptcha scores range from 0 (0% probability of the respondent being a human) to 1.0 (virtual certainty that a respondent is a human).

Next, I examined responses in each category (likely-bots vs likely-humans) to examine whether respondents in each category should be recategorized as bots or humans based on

multiple criteria. These criteria included duplicate IP addresses, unusual response patterns (e.g., duplicate consecutive response sets, irrelevant qualitative responses to my qualitative item included in the survey), RelevantID scores (generated by Qualtrics by analyzing a respondent's browser, operating system and location for duplicate responses), two custom made bot-detection items included in the survey (Appendix), and

demographic information (e.g., indicating being a professor in response to one demographic item but also indicating a Bachelor's degree as one's highest level of education on another demographic item).

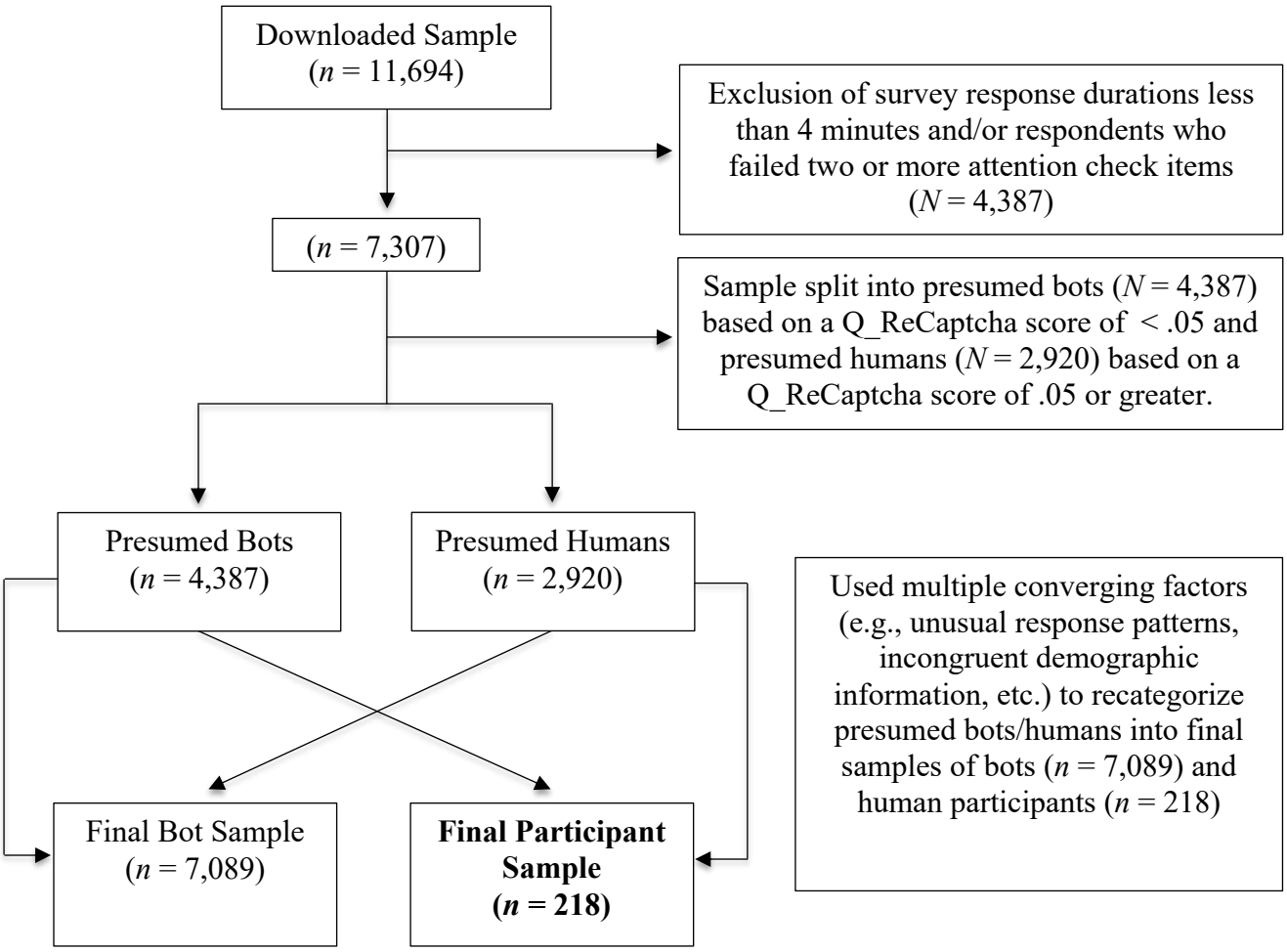

Figure 2. Initial Data Cleaning Steps

Additional data cleaning steps included computing descriptive statistics and frequency distributions for all variables to check assumptions regarding normality as well as for missing data and outliers. Cases with a z-score of +/-3.29 or greater were considered univariate outliers (Field et al., 2012). For one essential (essential meaning a variable included in hypotheses 1-6 or any of the four exploratory research questions) variable, which was the aggregate number of OHP items answered correctly, there were two outliers. To assess whether these outliers had an impact on the significance of results, the analyses including the aggregate number of OHP items answered correctly were conducted both with and without the two outlier cases. Significance of results was not impacted by these outliers (Appendix)

No essential variables (e.g., variables included in hypotheses 1-6 or four exploratory research questions) had missing values. However, several variables had occasional missing cases (e.g., age, missing 3.9% of cases) and several other variables had a substantial number of missing cases (e.g., years since last OHP course, missing 38.9% of cases). Items that were missing more than 5% of cases only included content asking participants how many years it had been since a specific event (e.g., the completion of a degree or course).

Last, all dependent/criterion variables, which identified the aggregate number of correct true/false items in each topic area (e.g., training & development, performance feedback, OHP) in hypotheses 1-6 had a significant negative skew within their histograms. Z-scores for skew and kurtosis values were also calculated and showed these variables consistently violated the assumption of a normal distribution. Mean and SD values for study variables are reported in the correlation matrix in Table 2.

Table 2

Correlations among Major Study Variables

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Years of Work Exp.	10.91	9.74															
2. Education	N/A	N/A	.23*														
3. Years Since Last Degree	N/A	N/A	.87*	.20*													
4. I-O Major	N/A	N/A	-.12	.30*	-.09												
5. OHP Concen.	N/A	N/A	-.26	-.14*	-.26*	-.11											
6. OHP Courses Taken	N/A	N/A	-.28	-.04	-.31*	-.07	.59*										
7. Years Since Last OHP Course	9.30	7.34	.82*	.28*	.91*	-.02	-.24*	-.16*									
8. Training Courses Taken	N/A	N/A	.01	-.23*	0.05	-.16*	.10	-.35*	.04								
9. Years Since Last Training Course	11.20	9.72	.75*	.44*	.85*	.19*	-.27*	-.31*	.83*	-.17							
10. PM Courses Taken	N/A	N/A	-.06	-.19	-.09	-.06	.09	.27*	-.05	.59*	-.17*						
11. Years Since Last PM Course	10.57	9.36	.69*	.44*	.85*	.22*	-.27	-.31*	.88*	.04	.96*	-.08					

12. Overall Number of Items Correct out of 28	20.25	4.43	.12	.43*	.09	.24*	-.35*	-.18*	.23*	-.15*	.29*	-.22*	.25*				
13. Training Items Correct	2.63	1.30	.14*	.37*	.15*	.21*	-.34*	-.25*	.24*	-.12	.27*	-.15*	.24*	.79*			
14. Performance Feedback Items Correct	9.41	1.78	.11	.36*	.09	.18*	-.28*	-.16*	.24*	0.11	.24*	-.18*	.22*	.84*	.56*		
15. OHP Items Correct	8.21	2.18	.06	.36*	.02	.22*	-.28*	-.08	.15	-.15*	.24*	.20*	.19*	.88*	.54*	.56*	
16. Overall Perceived Expertise	3.65	0.75	-.16*	-.21*	-.18*	-.05	.39*	.41*	-.30*	.18*	-.32*	.23*	-.30*	-.25*	-.29	-.19*	-.18*

Note. (n = 218). *p < .05 (two-tailed test). **p < .01 (two-tailed test). PM = Performance Management. Exp. = Experience.

Individual Item and Topic Results

On average, participants responded most correctly to performance feedback items (78%), followed by training & development items (65%) from Rynes et al. (2002) and responded least correctly to OHP items (63%). Correct versus incorrect response rates for individual items are also summarized below in Table 3.

Table 3

Items, Correct Responses, and Scores

Topic/Items	Correct Answer	% Correct Responses	% False / Uncertain
Training & Development Items:			
Lecture-based training is superior to all other forms of training delivery for job performance	False	80.8%	15.3% (3.9%)
Training job performance is more effective with older adults than younger adults	False	59.8%	17.9% (22.3%)
The most important factor for how much training employees actually use on their jobs is how much they learned during training	False	56.3%	34.5% (9.2%)
Training for simple skills will be more effective if it is presented in one large session than if it is presented in several	False	65.9%	24.9% (9.2%)

shorter sessions over time			
Average % Correct, Incorrect, and Uncertain for Training & Development Items:	N/A	65.7%	23.1% (11.2%)
Performance Feedback Items:			
Lower-performing employees tend to avoid feedback more than higher-performing employees	True	63.8%	21.4% (14.8%)
Feedback typically facilitates greater behavioral change in less-experienced employees compared to more experienced employees	True	59.8%	24.5% (15.7%)
Managers generally rate employees' job performance more harshly than deserved	False	60.3%	27.1% (12.7%)
Managers rarely ever distort performance feedback they give to employees	False	83%	15.3% (1.7%)
To improve employees' reactions to feedback, performance feedback should focus on employees' behavior rather than their personality	True	94.8%	2.2% (3.1%)

Generally speaking, feedback is better when it is broader rather than specific	False	84.7%	14.4% (.9%)
The more a manager assumes the role of a coach, such as helping an employee with professional development, the more positively an employee responds to feedback	True	93%	3.9% (3.1%)
Though sandwiching negative feedback between two pieces of positive feedback may improve employee reactions to feedback, there isn't clear evidence it improves actual performance	True	76.9%	13.1% (10%)
More frequent feedback is associated with greater employee performance improvements	True	83.4%	6.1% (10.5%)
Employees tend to react more positively to feedback if it is less frequent	False	65.5%	20.1% (14.4%)
Employees have more positive reactions to performance feedback when they have a say in how their performance is evaluated	True	96.1%	1.7% (2.2%)

Employees' reactions to feedback are more influenced by how good of a relationship they have with their manager than the feedback (e.g., positive or negative) itself	True	79.9%	8.7% (11.4%)
Average % Correct, Incorrect, and Uncertain for Performance	N/A	78.4%	13.2% (8.4%)
Feedback Items: OHP Items:			
Psychological detachment from work is important for reducing the negative consequences of work-related stress	True	86.5%	9.2% (4.4%)
Within organizations, mindfulness meditation interventions reduce stress more than cognitive behavioral interventions	False	34.9%	35.4% (29.7%)
Well-rested workers are equally as likely as sleep-impaired workers to engage in unethical behavior such as taking credit for others' work	False	66.4%	20.1% (13.5%)
Across occupations, employees perceive negative interpersonal interactions with their	True	15.3%	83% (1.7%)

manager as the most stressful part of their job			
Shift work is not associated with workers' long-term health outcomes	False	86.9%	11.4% (1.7%)
To reduce workplace accidents, organizations should offer employees bonuses for reduced workplace accidents	False	41.9%	44.5% (13.6%)
Accidents are more likely when employees feel pressure to meet deadlines	True	61.6%	19.7% (18.8%)
The personality trait known as agreeableness (e.g., being cooperative) is associated with performing more safety behaviors in the workplace	True	83.4%	13.5% (3.1%)
Thinking about workplace communications (e.g., thinking about responding to emails or texts about work) during non-work hours is associated with improved sleep quality	False	35.4%	41% (23.6%)
More than 75% of organizations offer some form or type of workplace health	False	71.2%	22.7% (6.1%)

promotion programs to employees			
Most organizations that use workplace health promotion programs systematically evaluate those program's results	False	78.6%	7.4% (14%)
When employees have a free workplace health promotion program available to them, typically less than a third use it	True	94.3%	2.2% (3.5%)
Average % Correct, Incorrect, and Uncertain for OHP Items:	N/A	63%	25.8% (11.2%)

Primary Hypotheses

A Mann-Whitney test was used to test hypotheses 1-3 and hypothesis 6 by testing differences in the number of items responded to correctly across groups (e.g., academics versus practitioners, or, sub-groups such as academics with an OHP concentration versus academics without). The Mann-Whitney between-groups test was chosen because it is a non-parametric test and does not require the assumption that data are normally distributed (Field, 2009). This was important given that all criterion variables for hypotheses 1-6 had significantly non-normal distributions. Though the convention for the Mann-Whitney test is to report the median (in this case the median number of correct responses for each group), the mean, standard deviation and median for each group are summarized in Table 4 below, particularly to draw attention to the

magnitude of group difference in the average number of items answered correctly for hypotheses 1-3 and hypothesis 6.

Given that criterion variables such as the number of correct responses to true/false items across domains (e.g., training & development, performance feedback) were non-normally distributed, Spearman's correlation coefficient (Spearman's rho) was used to test hypotheses 4-5 and exploratory questions in lieu of Pearson's R correlation coefficient. Unlike Pearson's R correlation coefficient, Spearman's correlation coefficient is a non-parametric test and does not require normally distributed variables (Field, 2009).

Hypothesis 1

Regarding hypothesis 1, academic respondents' number of correct responses (*Mdn* = 3.00) to training & development true/false items was significantly higher than practitioners' correct responses (*Mdn* = 3.00), $U = 5065.50$, $z = -1.96$, $p < .05$, $r = -.13$.

Hypothesis 2

As predicted, for performance feedback items (hypothesis 2), academics answered significantly more items (*Mdn* = 10.00) correctly compared to practitioners (*Mdn* = 9.00), $U = 4787.00$, $z = -2.53$, $p < .015$, $r = -.17$.

Hypothesis 3

Also as predicted, academics answered significantly more OHP items (*Mdn* = 9.00) correctly compared to practitioners (*Mdn* = 8.00), $U = 4643.00$, $z = -2.62$, $p < .01$, $r = -.18$.

Hypothesis 4

Neither hypothesis 4a nor hypothesis 4b were supported as, among the subgroup of practitioners, the number of training & development courses was not positively associated with correct responding to training & development items (hypothesis 4a), $r_s = -.03$, *ns*, and the number

of performance feedback courses was not associated with correct responding on performance feedback items, r_s = -.10, *ns*.

Hypothesis 5

Hypothesis 5, which was that among practitioners the number of OHP courses taken would be associated with correct responses to OHP items, was not supported as, among the subgroup of practitioners, the number of OHP courses was instead negatively associated with correct responding to OHP items, r_s = -.20, $p < .05$

Hypothesis 6

Among academic respondents, those with a concentration in OHP (n = 68) did not answer more questions correctly (*Mdn* = 8.00) compared to those without an OHP concentration *(n* = 150) (*Mdn* = 9.00), despite my prediction, U = 951.50, z = -3.44, $p < .001$, r = -.23. Instead, those without an OHP concentration answered significantly more true/false OHP items correctly. For the Mann-Whitney between-groups significance test, the median is reported given data are commonly non-normally distributed (e.g., skewed) (Field, 2009).

Table 4

Median, Mean, and Standard Deviations for Group Hypotheses with an Emphasis on Means

Hypothesis	Hypothesis Supported	Academics' Mean (SD) and Median	Practitioners' Mean (SD) and Median	Mean Difference of # Items Correct	Total # of Test Items
Hypothesis 1 – Academics Will Answer More Training & Development Items Correctly	Yes	2.89 (1.11) 3.00	2.48 (1.38) 3.00	.41*	4

Hypothesis 2 – Academics Will Answer More Performance Feedback Items Correctly	Yes	9.78 (1.56) 10.00	9.09 (1.93) 9.00	0.69**	12
Hypothesis 3 - Academics Will Answer More OHP Items Correctly	Yes	8.74 (1.87) 9.00	7.93 (2.21) 8.00	0.81**	12
Hypothesis	Hypothesis Supported	OHP Concentration Group's Mean (SD) and Median	Non-OHP Concentration Group's Mean (SD) and Median	Mean Difference of Items Correct	Total Items
Hypothesis 6 – Among Academics, Those with an OHP Concentration Will Answer More OHP Items Correctly than Those without	No	7.71 (2.07) 8.00	9.15 (1.64) 9.00	1.44**	12

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

Exploratory Research Questions

Regarding the first exploratory research question of whether years since graduating is associated with more correct responding, there was no observed association, $r_s = .03$, *ns.*

The second exploratory question was whether the perception of oneself as an expert is associated with correct responding. For this question, self-perceived expertise was negatively associated with correct responding, $r_s = -.21$, $p < .001$.

The third exploratory question was whether having a PhD in I-O psychology relative to other fields would be associated with increased correct responding. Indeed, being an I-O psychology major was associated with increased correct responding, $r_s = .20$, $p < .01$.

The final exploratory question for the current study was whether academics and practitioners rely on different sources for knowledge of published I-O psychology findings and whether their attitudes toward those sources differ. Responses regarding common sources for knowledge and attitudes toward said sources for the full sample including both academics and practitioners are summarized in Tables 5-7 and responses by group (e.g., academics versus practitioners) are summarized in Tables 8-10.

Table 5

Frequencies with Which Periodicals Are Read for Full Sample

Periodical	Mean (Median)	Standard Deviation
Human Resource Magazine	2.08 (2.0)	1.27
Wall Street Journal	2.63 (3.0)	1.10
HR Focus	1.77 (1.0)	1.11
Human Resource Executive	1.80 (1.0)	1.16
Human Resource Management Journal	2.44 (2.0)	1.13
Workforce	1.78 (1.0)	1.18
Business Week	2.20 (2.0)	1.11
Fortune	2.46 (2.0)	1.09
Forbes	2.71 (3.0)	1.03
Harvard Business Review	3.20 (3.0)	1.04
Human Resource Planning Journal Inc.	1.72 (1.0)	1.12

Fast Company	2.12 (2.0)	1.14
Personnel Psychology	3.09 (3.0)	1.14
Journal of Applied Psychology	3.45 (4.0)	1.15
Academy of Management Executive	2.25 (2.0)	1.19
Academy of Management Journal	2.85 (3.0)	1.12

Note. 1-5 scale, where 1 = "never," 2 = "rarely," 3 = "sometimes," 4 = "usually," and 5 = "always"

Table 6

Broader Sources of Knowledge for Solving Human Resource Problems for Full Sample

Resource	Mean (Median)	Standard Deviation
Other HR professionals in my organization	2.69 (3.0)	1.30
SHRM website	2.51 (2.0)	1.22
Other websites	3.07 (3.0)	1.06
HR research literature	3.13 (3.0)	1.13
HR professionals in other organizations	2.68 (3.0)	1.22
Consultants	2.64 (3.0)	1.22
Academics	3.25 (3.0)	1.17

Note. 1-5 scale, where 1 = "rarely or never," 2 = "a few times per year," 3 = "about once a month," 4 = "several times a month," and 5 = "almost daily."

Table 7

Attitudes toward Academics and Research for Full Sample

Attitude	Mean (Median)	Standard Deviation
I wish I had more time to read about academic HR research findings.	3.32 (3.0)	1.13
Most research findings make sense in theory, but don't work well in practice.	2.99 (3.0)	1.10
I would like to spend more time talking with academics about HR problems	2.04 (2.0)	1.24
I generally don't find academic HR research to be very useful	2.44 (2.0)	1.27
I often with I could call an academic to help me solve HR problems	2.61 (3.0)	1.14

Note. 1-5 scale where 1 = "rarely or never," 2 = "a few times a year," 3 = "about once a month," 4 = "several times per month," and 5 = "almost daily."

Table 8

Frequencies with Which Periodicals Are Read for Academics and Practitioners

Periodical	Academics (Mean)	Practitioners (Mean)
Human Resource Magazine	1.85	2.38
Wall Street Journal	2.58	2.75
HR Focus	1.65	1.94
Human Resource Executive	1.61	2.06

Human Resource Management Journal	2.55	2.37
Workforce	1.60	2.05
Business Week	2.01	2.46
Fortune	2.25	2.72
Forbes	2.45	3.02
Harvard Business Review	2.97	3.45
Human Resource Planning Journal Inc.	1.55	1.94
Fast Company	1.97	2.32
Personnel Psychology	3.42	2.77
Journal of Applied Psychology	3.83	3.07
Academy of Management Executive	2.35	2.12
Academy of Management Journal	3.15	2.49

Note. 1-5 scale, where 1 = "never," 2 = "rarely," 3 = "sometimes," 4 = "usually," and 5 = "always"

Table 9

Broader Sources of Knowledge for Solving Human Resource Problems by Group

Resource	Academics (Mean)	Practitioners (Mean)
Other HR professionals in my organization	2.25	3.21
SHRM website	2.35	2.74
Other websites	2.85	3.35
HR research literature	3.10	3.21
HR professionals in other organizations	2.40	3.07
Consultants	2.34	3.00
Academics	3.55	2.96

Note. 1-5 scale, where 1 = “rarely or never,” 2 = “a few times per year,” 3 = “about once a month,” 4 = “several times a month,” and 5 = “almost daily.”

Table 10

Attitudes toward Academics and Research by Group

Attitude	Academics (Mean)	Practitioners (Mean)
I wish I had more time to read about academic HR research findings.	3.37	3.33
Most research findings make sense in theory, but don’t work well in practice.	3.06	2.95
I would like to spend more time talking with academics about HR problems	2.07	2.01
I generally don’t find academic HR research to be very useful	2.29	2.63
I often with I could call an academic to help me solve HR problems	2.51	2.75

Note. 1-5 scale where 1 = “rarely or never,” 2 = “a few times a year,” 3 = “about once a month,” 4 = “several times per month,” and 5 = “almost daily.”

CHAPTER 4: DISCUSSION

This study examined academics' and practitioners' knowledge of published findings from I-O psychology. In general, the results indicated that respondents answered a clear majority (69.98%) of true/false items correctly. This overall percent-correct score was appreciably higher compared to past findings of 57% (Rynes et al., 2002), 62% (Sanders et al., 2008), and 57% (Tenhiälä et al., 2014) for overall percent-correct scores. However, the difference between my results and the overall percent of items answered correctly in prior research appeared to be driven most by the especially high percent (78.4%) of performance feedback items answered correctly in the current study.

In previous research, the percent of items responded to correctly in most topics has tended to congregate around 60% (Rynes et al., 2002; Sanders et al., 2008; Tenhiälä et al., 2014). The current study has some similarities. Though respondents scored the highest on performance feedback items (78.4% correct), respondents answered a notably lower 65.7% of training & development items correctly. Participants scored the lowest on OHP items, answering only 63% of items correctly. Though previous research has not included the same OHP or performance feedback items as the current study has, some studies have used the same training & development items as those used in the current study, allowing for a more direct comparison. For example, respondents answered 65.7% of the training & development items correctly in the current study, which was similar to the 70.75% of the same training & development items answered correctly in the seminal study conducted by Rynes et al. (2002) and 71% answered correctly in the study conducted by Tenhiälä et al. (2014). In short, participants performed especially well on performance feedback (78.4% correct) compared to training & development (65.7% correct) and OHP (63% correct), as well as compared to typical percentages correct in

other research, which commonly range from 57% (Tenhiälä et al., 2014) to 70.75% (Rynes et al., 2002).

I predicted that academics would answer more true/false knowledge items correctly compared to practitioners on training & development (hypothesis 1), performance feedback (hypothesis 2), and OHP (hypothesis 3) true/false items. I also predicted that among practitioners, the number of organizational training and performance management courses taken would be positively associated with the number of correct responses on training & development (hypothesis 4a) and performance feedback (hypothesis 4b) items respectively, as well as that the number of OHP courses would be associated with correct responses to OHP items (hypothesis 5). Last, I predicted academic respondents with a concentration in OHP would answer more OHP items correctly than academic respondents without a concentration in OHP (hypothesis 6).

These hypotheses were based on prior research that has shown that formal education is associated with increased learning and more accurate reasoning about material from that topic. For instance, in their longitudinal study, Lehman & Nisbett (1990) found that undergraduate psychology majors significantly improved in their statistical and methodological reasoning from year one of their undergraduate training to year four. Lehman & Nisbett (1990) also found a correlation between number of statistics courses taken during undergraduate training and improved performance in statistical reasoning, suggesting an association between statistical coursework and improved statistical reasoning.

In another study involving psychology graduate students, Lehman et al. (1998) found similar results in both their longitudinal and cross-sectional studies. In their cross-sectional study, third-year psychology graduate students substantially outperformed first-year psychology graduate students in an assessment of statistical and methodological reasoning. In their

longitudinal study, the first-year students from first study completed the same statistical and methodological reasoning assessment in their third year and showed substantial improvements. Lehman et al. (1998) suggested the improvements were likely due to the learning of probabilistic and statistical rules psychology students learn through their coursework.

There are also scientifically validated means that plausibly explain why formal education can be especially conducive of learning. 'The testing effect,' for example, refers to the finding that testing of learned information such as through quizzes and exams helps consolidate memories of newly learned material (Rowland et al., 2014). The 'testing effect' is especially effective for learning and retaining new information when testing is done over extended periods of time, such as through midterm or final exams commonly done in formal education courses (Latimier et al., 2021).

In the current study, hypotheses 1-6 were partially supported. Academics answered more true/false training & development, (hypothesis 1), performance feedback (hypothesis 2) and OHP (hypothesis 3) items compared to practitioners. The findings from hypotheses 1-3 are congruent with prior findings that formal education is associated with increased knowledge (Lehman & Nisbett, 1990; Lehman et al., 1998), particularly as academics had substantially more education (Cohen's $d = .8$, $p < .001$) compared to practitioners in the current study. It must be noted, however, that the effect sizes for differences between academics and practitioners for all three hypotheses were small ($r = < 2.0$). It is helpful not only examine effect sizes, but also group mean differences. For example, for hypothesis 2, academics only answered an average of 9.78 true/false items correctly compared to an average of 9.09 items answered correctly by practitioners. Consequently, out of 12 true/false items testing knowledge of published findings on performance feedback, academics answered only 0.69 more items on average compared to

practitioners. The mean difference for training & development items between academics and practitioners is even more modest. Out of four training & development true/false items, academics answered 2.89 items correctly on average compared to 2.48 answered correctly by practitioners. Put another way, academics answered only .41 more items correctly than practitioners out of four total true/false items.

Hypotheses 4a and 4b tested whether, among practitioners, the number of completed courses in training & development (hypothesis 4a) and performance management (hypothesis 4b) and were associated with correct responding in each respective topic and there were no significant associations. This was surprising given hypotheses 2 and 3 being supported and given prior research finding that formal education is associated with increased knowledge in a domain (Lehman et al., 1998; Lehman & Nisbett, 1999). These non-significant results may be explained in several ways. First, though minor, the items assessing the number of courses taken in the current study may have led to range restriction. Items assessing the number of courses participants took in each topic (e.g., training & development, performance feedback, OHP) included responses ranging from "no courses" to "3 or more courses" when it is possible participants may have taken four or more courses within a topic. Due to the highest possible response being "3 or more," I failed to measure variability in this variable at its upper end.

However, another explanation may be that participants may not have reliably remembered the number of courses they had taken in each subject (e.g., training & development or performance management), as memory is known to decay over time (Ebbinghaus, 1885; Murre et al., 2015). Unreliable memory may help explain both why there was no association between the number of courses participants remembered taking and correct responses to true/false items on that topic (hypotheses 4a & 4b), as well as why being an academic was

associated with correct responding (hypotheses 1-3). This is because it would likely be harder for participants to remember how many courses they had taken years ago compared to what their current occupation is.

Hypotheses 5 & 6 examined relationships between variables related to education within OHP and the criterion variable of correct responding to OHP items. Hypothesis 5 examined whether, among the subsample of practitioners, the number of OHP courses completed was positively associated with correct responding to OHP true/false items. The result for this hypothesis was significant in the opposite direction from my hypothesis. The number of OHP courses practitioners took in the past was instead negatively associated with correct responding to OHP items. Given the results of hypothesis 6, which will be examined next, the results of hypothesis 5 are not likely to be mere type 1 error, despite the effect size for this finding being relatively small (r_s = .20). Hypothesis 6 predicted that, among the subsample of academic respondents, participants with an OHP concentration would answer significantly more true/false OHP items compared to participants without an OHP concentration. This hypothesis was significant, but again only in the opposite direction relative to what was hypothesized. Namely, academics with an OHP concentration answered significantly fewer OHP items correctly compared to those without an OHP concentration (r = -.23).

The findings of hypothesis 5 & 6 may be explained in several ways. One potential explanation may be due to a phenomenon known as the "half-life of professional knowledge" Neiymeyer et al. (2012). This refers to the time required for half of a professional's knowledge to be 'out of date' due to new findings within a field overturning prior findings. For example, one study found the half-life for organizational and business psychology knowledge was 12 years (Neiymeyer et al., 2014). It may be that some true/false OHP items in the current study are

subject to the half-life problem. For example, it likely seemed intuitive in decades past that providing a reward for reduced workplace injuries was a good idea, especially given that extrinsic rewards have been recognized having the potential to influence behavior since the early years of I-O psychology (Kanfer et al., 2017; Taylor, 1911). Yet more recent research has demonstrated that giving extrinsic rewards for reduced workplace accidents may backfire, as these reward systems may accidentally motivate employees to under-report legitimate workplace accidents (Leigh et al., 2004; Fell-Carlson, 2004). In summary, the items used in the current study are supported by contemporary research but may not have been supported by research from decades prior when some participants earned their OHP concentration.

Another explanation for the surprising findings for hypotheses 5 & 6, though, may be that participants who completed more OHP courses (or, especially an OHP concentration) were more susceptible to an overconfidence bias, which refers to when confidence exceeds accuracy when responding to questions/items designed to assess knowledge (Tversky & Kahneman, 1996). In the current study, some true/false items within each topic (e.g., training & development, performance feedback, and OHP) were intended to be difficult, as an array of excessively easy items would do a poor job of measuring knowledge for a given domain as all participants would score highly and therefore have little to no variability in their scores.

A challenge in using difficult items to assess knowledge, though, is that respondents are more likely to experience overconfidence bias on difficult items relative to easy items (as it is difficult for respondents to be overconfident on easy items given that participants do indeed tend to answer easy items more correctly, just as expected) (Tversky & Kahneman, 1996). Because those who have completed more OHP courses and/or a past OHP concentration are more likely to have higher self-efficacy regarding their knowledge of OHP due to relevant previous

accomplishments (e.g., passing OHP classes or earning a concentration) (Bandura, 1978), they may also be more likely to overlook important details in items and respond to items too quickly. This explanation may be corroborated by the results of one of the exploratory research questions examined in the current study. In particular, the self-perception of expertise in the current study was negatively associated with correct responding on true/false I-O psychology items overall. Though the effect size was small, this significant finding was what would be expected if overconfidence influences participants to respond too quickly such as by overlooking important details within items.

Exploratory research questions two and three examined whether different education-related variables (e.g., time since degree completion, degree major choice) are associated with answering more true/false items correctly. For instance, the second exploratory research question examined in the current study was whether years since graduating would be associated with more correct responding, but in this case, there was no significant association. As discussed, the forgetting of knowledge following education or training is referred to as "fadeout," and has been found to occur across different age ranges (Bailey et al., 2020). As a concrete example, Bahrick & Hall (1991) found that 10 years after their last algebra class, students' performance in algebra reduced by 30%. Performance also continued to decline each year after. However, research has also found that crystalized knowledge (e.g., knowledge of the world and how it works) tends to increase over the lifespan as individual gain more life experience (Li et al., 2013; Simpson-Kent et al., 2020). One may have consequently also expected that years since completing a degree would be associated with correct responding due to accumulated life experience and resulting additional knowledge. The third exploratory question examined in the current study was whether having a PhD in I-O psychology relative to other fields would be associated with increased

correct responding. As may be expected, being an I-O psychology major was associated with increased correct responding relative to non-IO psychology majors (e.g., psychology, management, other), though the effect size was modest (r = .20).

The final exploratory question for the current study was whether academics and practitioners rely on different sources for knowledge of published I-O psychology findings and whether their attitudes toward those sources differ. Responses regarding common sources for knowledge and attitudes toward said sources for the full sample are summarized in Tables 5-7 and responses by group (e.g., academics versus practitioners) are summarized in Tables 8-10. As can be seen in Table 8, there were minimal differences between how often practitioners and academics reported reading different periodical sources. The largest differences in this periodical source category were that practitioners reported reading Forbes more often and academics reported reading Academy of Management Journal, Journal of Applied Psychology, and Personnel Psychology more often. Although even these larger differences for this category only differed by .60-.76 on a five-point Likert-type scale.

Larger differences could be seen when comparing academics and practitioners in the next category, which compared the usage of broader knowledge sources used by academics and practitioners, such as reaching out to consultants or academics for information, as well as reading over websites such as the SHRM website (Table 9). Like the theme in Table 8 featuring use of different periodicals read by practitioners and academics, there were minimal differences in what written sources (SHRM website, "other websites," and HR research literature) were used by practitioners versus academics in second category of broader sources of knowledge. There were appreciable differences though in what broader sources of knowledge were reported as commonly used, such as reaching out to academics, consultants, and HR professionals for help

solving HR problems. The largest difference was in whether the two groups used HR professionals within one's own organization as a knowledge source, with a mean difference of .96 on a five-point Likert-type scale. Academics reported asking an HR professional in their own organization for help solving HR problems only about a few times a year while practitioners reported asking about once a month.

Last, regarding the category of attitudes toward published research (Table 10), academic and practitioner respondents again had. Each group's approximate response of 3.0 to this item meant they had the thought that, "academic research findings make sense in theory but don't work well in practice" about once a month. The largest group difference in the category of attitudes toward published research, though, was in response to the item, "I generally don't find academic HR research to be very useful," in which practitioners reported having the thought slightly more ($M = 2.63$) compared to academics ($M = 2.29$). Although even this difference was modest given responses were again on a five-point Likert-type scale in which a response of "2" meant they had the thought "a few times a year" and a response of "3" meant they had the thought "about once a month."

The results of the current study contribute to the literature on the science/knowledge gap within I-O psychology in several ways. Using past literature on the efficacy of formal education in increasing/retaining knowledge, such as through the testing effect (Rowland et al., 2014) and spaced testing (Latimier et al., 2021), I hypothesized that academics would answer more items correctly compared to practitioners. This research therefore builds and expands on earlier research regarding the relationship between formal education and knowledge attainment and retention (Lehman & Nisbett, 1990; Lehman et al., 1998).

The current study also adds to the literature by expanding examination of the science/knowledge gap to new areas. Though past research has examined the science/knowledge gap in more conventional topics of I-O psychology such as training & development and selection (Rynes et al., 2002; Fisher et al., 2020), this study also expanded on this prior work by investigating the science/knowledge gap in performance feedback and OHP, adding depth and breadth to literature on the science/knowledge gap. If research findings from OHP and performance feedback are going to effectively implemented in organizations to improve workers' lives, it is crucial to uncover where knowledge gaps exist within each of these subdomains.

The current study also opens new avenues for future research, particularly regarding the finding that OHP education (e.g., OHP courses completed and/or an OHP concentration) was associated with less correct responding on OHP true/false items. This finding was especially surprising given that academics, who on average had appreciably more formal education in the current study, outscored practitioners on all three topic areas. If the negative relationship between OHP education and correct responses on OHP items was due to the higher likelihood for an overconfidence bias among those more educated, it is hard to understand why academics more broadly were not also more susceptible to an overconfidence bias given their higher average educational achievement compared to practitioners.

Implications for the Science/Knowledge Gap

Potentially the largest contribution from the current study to literature on the science/knowledge gap was the inclusion of both practitioners and academics. All prior research I have found has discussed the science knowledge/gap among practitioners alone (Rynes et al., 2002; Sanders, 2008; Tenhiälä et al., 2014; Fisher et al., 2020). Although such research is useful,

it makes it difficult to clarify if there is indeed a science/knowledge gap at all among practitioners (relative to academics) or whether a science/knowledge gap among academics should be addressed first before attempting to bridge gaps between academics and practitioners. Put another way, if practitioners performed approximately the same on I-O psychology true/false items compared to academics, it would likely be an exaggeration to suggest there is a gap that needs to be fixed among practitioners when academic respondents score approximately the same. The current study helps clarify whether referring to practitioners' lack of total knowledge as a gap assumes an unrealistic expectation that academics may or may not meet themselves.

Accordingly, there are two potential implications from the current study for the science/knowledge gap in I-O psychology, which happen to be closely intertwined. These implications are that it is both difficult to assess whether academics have a science/knowledge gap of their own, and to what degree practitioners have a science/knowledge gap. As noted, the effect sizes in the current study for differences in knowledge between academics and practitioners in training & development, performance feedback, and OHP were small (average r = -.16). Mean differences for correct scores on true/false items between groups in the current study also help interpret significant p values in context. For example, though academics answered significantly more items (M = 9.78) than practitioners (M = 9.09), observing the means clarifies that academics only answered .69 more items correctly on average compared to practitioners on a set of 12 true/false items.

In fact, academics did not manage to outscore practitioners by even one item on average on any of the three topics of research in the current study. It must be acknowledged, though, that items in the current study are new and require additional research for validation and reliability, including training & development items used from Rynes et al., (2002), suggesting the lack of

substantial difference in scores between academics and practitioners may also be due to artifacts such as measurement error. Moreover, it is not clear whether the small difference in means between academics and practitioners is suggestive of a problematic science/knowledge gap among academics or encouraging news of a small science/knowledge gap among practitioners. In preparation for this study, the four training & development items that have been used multiple times in the literature (Rynes et al., 2002; Sanders et al., 2008; Tenhiälä et al., 2014) drew substantial disagreement from SMEs, all of which had a Ph.D. in I-O psychology.

It seems inevitable academics will have some or even substantial disagreement at any timepoint due to phenomena such as the "half-life of academic knowledge" in which some findings are challenged and overturned not by all scientists at once, but over the course of time (Neiymeyer et al., 2012; Neiymeyer et al., 2014). This disagreement will also inevitably be classified as a "science/knowledge gap" when there is only one correct answer for each item. This leads to another potential implication, which is that due to the shifting sands of scientific research, true/false items such as those used in the current study may not be appropriate for attempting to measure alleged science/knowledge gaps (Gibbons, personal communication). Given that prior findings may be in the process of being overturned by new research, true/false items may be inappropriate for measuring knowledge of a field in a common state of change. Another potential way of measuring the science/knowledge gap may be asking participants to complete written essays regarding best practices according to published research. However, it is still unknown whether such a method might avoid any of the challenges (e.g., half-life of academic knowledge, disagreement among experts) true/false items faced in the current study.

True/false items may also be inappropriate because such items may require more confidence than is reasonable for participants to respond one way or another given that there may

not yet be as strong of a consensus in many areas of I-O psychology as one might hope for, even if prior findings are not being overturned. In other words, experts often disagree and in some cases studies find contrasting findings, suggesting that even if this has been the case for decades, (e.g., even if there are no findings being overturned), a strong consensus may be more rare and difficult than expected, making true/false items less ideal for attempting to measure such complexity

To attempt to minimize a science/knowledge gap due to the half-life of professional knowledge, academics should consult with other I-O psychologists to ask about new findings within their own specializations/sub-fields (e.g., training, OHP) within I-O psychology. I-O psychologists may also consider the creation of a new annual journal or review chapter that could summarize new findings from within each sub-field in I-O psychology. Training programs in I-O psychology and OHP in particular may give special attention to the half-life of professional knowledge, such as by including novel review papers or chapters that summarize new findings in that field that have superseded past findings in the course content. When guest lecturers are invited, course instructors may ask guest lecturers to summarize any new findings in the field that have challenged previously held conventions among academics. Last, students may even be challenged through assignments, such as by being assigned the task of finding a past finding from within the field (e.g., OHP) that has given way to new research findings.

There is nonetheless value in using true/false items to assess the science/knowledge gap even if true/false items are relegated to a small piece of the larger puzzle aimed at assessing the science/knowledge gap. For example, all the training & development items in the current study were supported by empirical research (often meta-analyses) when Rynes et al. (2002) used these items and are still supported by contemporary research since Rynes et al., (2002), often in the

form of meta-analyses (Blume et al., 2010; Brunmair & Richter, 2019; Davenport, 2022; Lacerenza et al., 2017; Mundell et al. 2013). It is consequently less likely that respondents answered incorrectly on these items unless their knowledge of training & development was substantially (e.g., more than two-three decades) out-of-date (assuming there ever were published findings showing the opposite results of what contemporary research shows today). Examining results of these training & development items in the current study will shed further light on how these types of true/false item assessments can aid in researching the science/knowledge gap.

As mentioned above, it is not only difficult to assess the potential science/knowledge gap among academics, but also the magnitude of the science/knowledge gap among practitioners. It is useful, though, to look at one remaining statistic for the training & development items to illustrate how the magnitude of the science/knowledge gap may be assessed among practitioners. Though group means did not appear to differ substantially (e.g., academics only answered .41 training & development items more correctly than practitioners), as a percentage, this demonstrates a clear difference in scores between academics. Namely, while academics responded correctly to training & development items 72.27% of the time, practitioners responded correctly on the same items 62.04% of the time. In typical academic settings test scores such as these would be the difference between roughly average (72%) and poor (62%). Examining percentages between groups may help elucidate the science/practice gap among practitioners given that group mean differences may be less interpretable given varying numbers of true/false items from Rynes et al. (2002) or within the current study.

Limitations

There were several limitations in the current study. Though results are consistent with prior literature citing plausible causes for the finding that academics would outperform practitioners in having knowledge of published research findings, causal inferences cannot be made. For example, confounding variables may explain why academic respondents answered more true/false items correctly compared to practitioners. Academic respondents may have a greater awareness of published findings not because of their average higher education compared to practitioners, but because academics regularly conduct research and teach classes on the constructs commonly studied in the I-O psychology literature. It may also be that academic respondents were more likely than practitioners to major in I-O psychology, which was associated with increased correct responding in my first exploratory hypothesis in this study. It may also be that due to their increased experience in test-taking contexts, academics are on average better test-takers than practitioners. For example, academics may pick up on subtle cues in items that make them less likely to be true items, such as if the item uses extreme language such as “always,” or, “never.” Future research may add an unrelated true/false quiz in a domain that academics and practitioners would not be expected to differ on to assess whether academics are indeed better test-takers.

As mentioned above, the items used to assess knowledge in the current study are new and require additional research for validation and reliability, including training & development items used from Rynes et al., (2002). Therefore, it is difficult to assess whether the lack of substantial difference in scores between academics and practitioners may also be due to measurement properties of the items used in this study, such as measurement error.

The common methods (e.g., Likert-type scales and even online survey formats) used in the current study to administer items to respondents also suggest our results should be interpreted with caution. More specifically, relationships between variables may be inflated due to common-method bias (Podsakoff et al., 2003; Podsakoff et al., 2013). Relatedly, in some cases my measures lacked precise measurement. For example, all items asking participants about the number of classes they took may have been subject range restriction due to capping Likert-type scale responses at "3 or more courses" (e.g., within OHP, or within training & development) rather than asking participants to enter a number in an open text box. Items assessing the number of courses participants took within a given subject may also lead to measurement error due to poor memory of the number of courses taken in the past, particularly for those who completed their education further back in time (Ebbinghaus, 1885; Murre et al., 2015).

Several items also appeared to facilitate missing responses from respondents. Items asking participants how many years it has been since an event, such as the completion of their last course in OHP, had significantly fewer responses (as high as 38% missing) compared to other items. Though this did not occur with any items used in my primary or exploratory hypotheses, it limited potential consideration of other variables for additional exploratory hypotheses. Future research should ask respondents what the year of their last relevant event was, as recalling a year may be less cognitively demanding than counting the number of years between a past year and the current year.

Some true/false items in the current study may also be limited due to their content being knowledge that may not be relevant to practitioners' daily lives. For example, the item, "More than 75% of organizations offer some form or type of workplace health promotion programs to employees" may not offer practical information to practitioners for their organization,

particularly that they would use often. Future research should implement more items that contain information that would have a higher likelihood of being relevant to managers in their day-to-day experiences. For instance, the item, "Accidents are more likely when employees feel pressure to meet deadlines," likely contains information practitioners would weigh in their decision-making more often as deadlines are a routine occurrence in many organizations.

Last, responses to items that assessed respondents' attitudes toward I-O psychology research may have had higher than normal random error due to an incongruence between the directions for said items and the response anchors for said items. More specifically, the directions for attitude items asked for respondents to indicate their level of agreement with the following items while response anchors for said items used frequency-laden language (e.g., *1 = rarely or never*). This may have caused confusion among participants. One item in this section compounded the issue by having frequency-laden language in the item itself, namely, "I often wish…" making this item especially difficult to interpret in light of response anchors already being frequency-oriented.

Future Research Directions

Future research should attempt to examine potential causal explanations for findings in the current study. Experimental research would not be feasible, but mediation analyses may shed light on potential pathways antecedents (e.g., educational attainment, major) could influence criterion variables such as correct responding to true/false items. Future research should also attempt to extend or qualify findings from this study, such by testing whether there is a third confounding variable associated with both being an academic and greater correct responding to true/false items, such as conscientiousness (e.g., conscientious participants are more likely to achieve higher education levels/degrees and more likely to master course material in their

coursework, and hence topic knowledge, prior to becoming an academic) (Mammadov, 2022; Spielman et al., 2022).

Examining the unexpected relationship between OHP-related education (e.g., completing more OHP courses and/or an OHP concentration) and less correct responding to OHP items should also be examined in future research. As mentioned, self-perceived expertise was also associated with less correct responding to I-O psychology items as well in the current study. Future research should investigate potential causes for these relationships. For instance, future research may benefit from asking participants how often they take action to learn new information in their field to assess whether self-perceived expertise is associated with complacency and a lack of continual learning. Future research may also attempt to examine whether the negative relationship between self-perceived expertise and correct responding may be explained by the Dunning-Krueger effect (McIntosh et al., 2019). The Dunning-Krueger effect refers to the finding that stronger performers (in this case respondents with more correct responses) tend to evaluate their own level of skill or knowledge more accurately than those who perform poorly, as poor performers commonly have inflated perceptions of their own skills/knowledge (McIntosh et al., 2019). This may in turn shed light on potential reasons why self-perceived experts in a topic area may perform worse in relevant knowledge assessments. Another potential analysis could examine whether completion of a greater number of OHP courses (or an OHP concentration) in the past is associated with less correct responding when controlling for self-perceived expertise.

Relatedly, future research should attempt to examine why, in contrast with completion of OHP courses being associated with reduced correct responses to true/false items, the completion of courses in training & development and performance feedback, was unrelated to correct

responding on true/false items. In hypotheses 4a and 4b in the current study, the number of training & development and performance management courses completed was unrelated to correct responding in each topic area. Why training & development and performance feedback would be less likely to have their own potential overconfidence biases within respondents who completed more courses is unclear.

Last, it is important to acknowledge what the current study does not investigate. Importantly, this study does not shed light on the actual practices of academics or practitioners. For instance, practitioners may be aware of research findings but ignore them in practice in lieu of alternative practices they believe are more practical or effective. Conversely, practitioners may also even act in accordance with best practices from research but be unaware that their behaviors are what the published literature recommends. Hence in these cases practitioners may behave according to what is recommended in published research but guess incorrectly on true/false items such as in the current study that ask respondents what they think the published literature recommends or states. A final future research direction, then, would be to investigate what practices practitioners routinely engage in within organizations, why they engage in those practices (whether it be because they think such practices are recommended in published research or other reasons), and what they think published research recommends regarding practices for that context.

Conclusion and Summary

Previous research and the current study have used past findings regarding the relationship between formal education and the attainment and retention of knowledge to test hypotheses regarding occupation, major, and coursework, and their relationship to correct responding on true/false knowledge items. Though causality cannot be inferred and potential confounding

variables such as academics' research activities and courses taught must be further investigated, there is nonetheless evidence that academics answer more correctly than practitioners across topic areas (e.g., training & development, performance feedback, and OHP) in I-O psychology. This finding is relevant for scientists and practitioners as it demonstrates a potential referent point, namely academics' number of correct responses, that practitioners' responses can be meaningfully contrasted with to better understand the nature of the science/knowledge gap between published findings in I-O psychology and practitioners' knowledge of such findings.

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APPENDIX

Exploratory Research Questions

Is years since completing a degree associated with more or less knowledge of published research findings?

Is perception of oneself as an expert associated with more or less knowledge of published research findings?

Is having a Ph.D. in I-O psychology rather than management associated with more or less knowledge of published research findings?

Where do academics and practitioners attain information and what are their attitudes toward those sources?

Training & Development True/False Items

Lecture-based training is superior to all other forms of training delivery for job performance

Training job performance is more effective with older adults than younger adults

The most important factor for how much training employees actually use on their jobs is how much they learned during training

Training for simple skills will be more effective if it is presented in one large session than if it is presented in several shorter sessions over time

Performance Feedback True/False Items

Lower-performing employees tend to avoid feedback more than higher performing employees do

Feedback typically facilitates greater behavioral change in less-experienced employees compared to more experienced employees

Managers generally rate employees' job performance more harshly than deserved

Managers rarely ever distort performance feedback they give to employees

To improve employees' reactions to feedback, performance feedback should focus on employees' behavior rather than their personality

Generally speaking, feedback is better when it is broader rather than specific

The more a manager assumes the role of a coach, such as helping an employee with professional development, the more positivity an employee responds to feedback

Though sandwiching negative feedback between two pieces of positive feedback may improve employee reactions to feedback, there isn't clear evidence it improve actual performance

More frequent feedback is associated with greater employee performance improvements

Employees tend to react more positively to feedback if it is less frequent

Employees have more positive reactions to performance feedback when they have a say in how their performance is evaluated

Workers' reactions to feedback are more influenced by how good of a relationship they have with their manager than the feedback (e.g., positive or negative) itself

Occupational Health Psychology True/False Items

Psychological detachment from work is important for reducing the negative consequences of work-related stress

Within organizations, mindfulness meditation interventions reduce stress more than cognitive behavioral interventions

Well-rested workers are equally as likely as sleep-impaired workers to engage in unethical behavior such as taking credit for others' work

Across occupations, employees perceive negative interpersonal interactions with their manager as the most stressful part of their job

Shift work is not associated with workers' long-term health outcomes

To reduce workplace accidents, organizations should offer employees bonuses for reduced workplace accidents

Accidents are more likely when employees feel pressure to meet deadlines

The personality trait known as agreeableness (e.g., being cooperative) is associated with performing more safety behaviors in the workplace

Thinking about workplace communications (e.g., thinking about responding to emails or texts about work) during non-work hours is associated with improved sleep quality

More than 75% of organizations offer some form or type of workplace health promotion programs to employees

Most organizations that use workplace health promotion programs systematically evaluate programs afterward

When employees have a free workplace health promotion program available to them, typically less than a third use it

Self-Perceived Expertise Scale For All Three I-O Psychology Sub-Topics

I have knowledge that is specific to training & development/performance

management/occupational health psychology

I have the education necessary to be an expert in training & development/performance

management/occupational health psychology

I have knowledge about training & development/performance management/occupational health

psychology

I conduct research related to training & development/performance management/occupational

health psychology

I have the qualifications required to be an expert in training & development/performance

management/occupational health psychology

I have been trained in training & development/performance management/occupational health

psychology

Hypotheses 3, 5, and 6 Tested with Outliers Removed

Hypothesis 3 Results with the Two Outlier Values Removed

Academics answered significantly more OHP items (*Mdn* = 9.00) correctly compared to practitioners (*Mdn* = 8.00), $U = 5525.50$, $z = -2.04$, $p < .05$, $r = -.13$.

Hypothesis 5 Results with the Two Outlier Values Removed

Hypothesis 5, which was that among practitioners the number of OHP courses taken would be associated with correct responses to OHP items, was incorrect as, among the subgroup of practitioners, the number of OHP courses was instead negatively associated with correct responding to OHP items, $r_s = -.203$, $p < .05$

Hypothesis 6 Results with the Two Outlier Values Removed

Among academic respondents, those with a concentration in OHP did not answer more questions correctly (*Mdn* = 8.00) compared to those without an OHP concentration (*Mdn* = 9.00), despite my prediction, $U = 914.50$, $z = -3.58$, $p < .001$, $r = -.24$.

Custom Bot Detection Items

Item at start of survey:

“Bot-prevention question: Please create a unique 4-digit username for this study consisting of the first two letters of your mother's maiden name and the numerical month you were born). For example, Alex's mother's maiden name was Jackson and Alex's birth month is February, so Pat's username would be Ja02)”

Items at end of survey:

“Bot-prevention question: Please name a fruit that is r3d. For example a banana would not count.”

“Last bot-prevention question: Please enter your previously-created name (1st 2 letters of your mother's maiden name and the numerical month you were born). For example, Pat's mother's maiden name was Sampson and Part's birth month is June, so Pat's username would be Sa06)”