THESIS

A POLICY-CAPTURING STUDY OF PREFERENCES FOR DIFFERING TRAINING FACTORS

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ABSTRACT

A POLICY-CAPTURING STUDY OF PREFERENCES FOR DIFFERING TRAINING FACTORS

The present study applied policy-capturing, a methodology in which subjects act as their own control, to assess the utility of 32 different training scenarios. These scenarios were composed from levels of four different cues, or components, of training: whether the trainee was a new hire or tenured employee, whether the training content taught human or technical skills, whether the training method was classroom-based, computer-based, a blend of the two, or mobile-based, and whether the learning occurred individually or as part of a group. These cues were fully crossed to build the scenarios, so that participants saw every possible combination of the cues across the scenarios. Participants, who on average reported working fulltime, being with their organization for at least six years, and taking over 30 training courses across their career, were asked to rate these scenarios on how useful the training would be for them and for their job and to give an overall rating to the scenario. Additionally, participants reported their prior training experience, motivation to learn, role conflict, role overload, role ambiguity, and age. It was hypothesized that: (a) Each cue would each explain a significant proportion of variance in scenario ratings; (b) participants would combine cues interactively, and these interaction terms would explain a significant proportion of variance in scenario ratings; (c) more motivated to learn participants would combine cues interactively more frequently than less motivated participants; (d) more potentially stressed individuals would prefer less restrictive training methods (i.e., computer-based or mobile-based methods); (e) more experienced participants would combine cues interactively more frequently than less experienced participants; and (f) scenario ratings would decrease as age increased. Results were modeled at two levels – between and within subjects – and the results supported the notion that potential trainees have stable preferences for different training scenarios, these preferences vary across prior training experience and motivation to learn, and conceptions about training are formed prior to training. These results support the future exploration of training preferences, specifically how other cues might influence preferences, whether these preferences influence later training evaluations, and whether designing future training to match, even generally, the preferences of trainees improves training learning or transfer outcomes.

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INTRODUCTION

The practice of training is intended to hone the knowledge, skills, and abilities (KSAs) that are directly related to an individual's job (Kraiger & Culbertson, 2012). While the intent is simple, the path to training is anything but. Within the instructional system designs (ISD) model (Goldstein, 1980), training is only one step in a larger process designed to systematically develop training based on needs and resources available. According to McGehee and Thayer (1961), these steps include training needs assessment (TNA) (determining who needs to be trained, on what, and with what resources), training design (creating the training experience), training delivery (training employees in the relevant KSAs), and training evaluation (assessing the training for effectiveness). During the TNA process, important decisions are made about how training is delivered and whether (and how) it is to be tailored to individual trainees.

TNA becomes even more essential as the number of ways an individual can be trained grows and the extent to which training can be adapted to an individual as a result of computer technology. Training, once largely relegated to the classroom, now largely takes place on computers, tablets, and mobile phones, and the rate at which these devices deliver training is only increasing (Ho, 2015). Moreover, the computerization of training has – if not by function – by form individualized it. Employees who were once only trained in a classroom as a group are now often personally held responsible for training material made available to them on their personal computers or other devices. Consequently, the practice of training has at once become more technology-based and individually focused than ever before.

Training can be thought of as a complex learning situation in which trainees' individual characteristics and salient environmental cues both interact with the delivery of training material.

For example, the effectiveness of a given training program for an individual trainee depends on the trainee's motivation to learn which, in turn, may be influenced by that trainee's prior training experiences (Sitzmann, Brown, Ely, Kraiger, & Wisher, 2009). Thus, training design is critical. Generally speaking, the effectiveness of training is believed to be, in part, due to adherence to the ISD model (Arthur, Bennet, Edens, & Bells, 2003; Salas, Tannenbaum, Kraiger, & Smith-Jentsch, 2012). That is, training is believed to be more effective when thoughtful needs assessment and design are done, than when they are not. Thus, effective training is not simply a result of presenting information to trainees, but a function of how well the training was designed given the needs of the trainees and the goals of the organization.

TNA plays a critical role linking training to the goals of the organization, focusing on KSAs relevant to those goals, deciding who to train, and informing the design of the training (Reed & Vakola, 2006; Van Erde, Tang, & Talbot, 2008). Nevertheless, despite many researchers mentioning TNA as a best practice in training (e.g., Dierdroff & Surface, 2008; Goldstein, 1980; Kraiger, 2003; Kraiger & Culbertson, 2012; McGehee & Thayer, 1961; Surface, 2012), TNAs are neither reported often in the training literature (Arthur et al., 2003) nor receive theoretical attention (Ferreira & Abbad, 2013). This lack of research is especially problematic given that the rise in number of technology-based training methods and increased prevalence of individualized training has grown beyond the scope of current TNA practices.

Understanding the individual in the context of designing training and individualized training are relatively recent ideas (Kraiger, 2003). Technology and training research have increased the breadth of possible training factors, such as training methods, content, groups, or trainee tenure, that can be combined to create a specific learner experience, yet research has not developed TNA into a process that can easily assess and integrate these factors into training design. Kraiger (2003) noted that the links between needs assessment and other training constructs have not been deeply explored in the literature. For example, he believed that attitudes toward training, personality characteristics, and learning styles could be incorporated into person analysis to individually tailor training. With respect to disentangling the many factors – both environmental and individual – that compose the training experience, TNA research has fallen short even as its potential strategic benefit to organizations has increased.

The present study used policy capturing (Hammond, Stewart, Brehmer, & Steinmann, 1986) to capture the judgments rendered by potential trainees about which combinations of training factors, or cues, that they find most appealing. These decision policies (i.e., the patterns of judgments a trainee has when evaluating a variety of possible training scenarios) are likely to be based on preferences these potential trainees may have based on experiences, circumstances, or dispositions which predispose trainees to believe that some training cue combinations are overall better or better suited to them individually than other combinations. These preferences may provide insight into which training combinations are preferred and provide a new strategy for assessing the motivation of trainees and later training effectiveness. That is, having a training experience trainees perceive as ineffective or a mismatch for their preferences could negatively affect their learning and subsequent performance post-training. Thus, the present study intended to link learner judgments about future courses to individual characteristics that may underlie those judgments. Uncovering training preferences in preparation for future training falls wholly within the function of TNA, yet no study has explored these relationships, or how to even explore them, in great detail.

There is historically little research informing TNA effectiveness, specifically with respect to how people make judgments about training and what variables affect those judgments.

Knowing, for example, whether new or tenured employees have different training desires could help shape future training designs. In another case, trainees may prefer to teach themselves certain content on their own time but have access to an instructor for other types of content. The current study aims to address these practical gaps in training knowledge and provide recommendations for future TNAs and training design. Thus far, a case has been made for the need for more TNA research and specifically research on the preferences of trainees for a growing variety of training factors. Individual preferences for training can improve TNA practices and lead to better decisions about how to tailor training design to individual learners.

In the following section, a variety of training cues and individual differences will be discussed as a framework for how individual characteristics and the training context influence preferences for training. The training cues are training method, training content, individual or group learning, and organizational tenure. These cues composed different training scenarios, which are representations of possible training experiences trainees could have to choose from in an organization. The individual difference variables are prior training experience, role stress, motivation to learn, and age. Some of these relationships are based on prior research while others are based on intuitive links between the training process and variables that reasonably influence it, as this is a nascent area of research.

A Framework for Understanding Learner Preferences for Training

Figure 1 shows a preliminary framework for understanding which individual characteristics and training cues may affect participant judgments about their preferences for various types of training experiences. In the study, scenarios are composed from a set of training cues believed to influence training preferences. These cues are training method (classroom, computer-based, mobile, and blended), training content (i.e., whether the training content consists of primarily knowledge, skills, or abilities that are either socially or technically based), whether the trainee is being trained by him or herself or in a group, and the trainee's tenure, (i.e., whether the trainee is a new hire or an incumbent). To assess whether individuals systematically weight cues differently, individual characteristics will be captured too. These characteristics include prior training experience, motivation to learn, role stress, and age. Cues and individual differences will be discussed in turn.

Cues Composing Training Scenarios

Training Method	Training Content	Group Training	Organizational Tenure
Classroom	Social KSAs	Train as an individual	New hire
Computer	Technical KSAs	Train as a group	Incumbent
Mobile			
Blended			

Individual Differences Underlying Preferences for Training Scenarios

Prior Training Experience	Role Stress	Motivation to learn	Age
Method	Role Ambiguity		
Quality	Role Conflict		
Quantity	Role Overload		

Figure 1. A Framework for Understanding Learner Preferences for Training

Cues composing training scenarios

Training method. Training method refers to the medium in which a trainee interacts with the training material. Training methods include four major categories (Ho, 2015): face-to-face (in which a trainee is typically presented information by an instructor in a classroom setting with his or her peers), technology-delivered instruction (TDI; in which a trainee receives training material via computer software or the Internet and studies the material by him or herself), mobile (in which a trainee receives training material through a smartphone or tablet which may present information at specific times or locations), and blended (a combination of TDI and face-to-face; the trainee studies material independently and intermittently attends a class to reinforce material or receive an explanation of complex material (Means, Toyama, Murphy, & Baki, 2013)). Deciding which training method – face-to-face, TDI, mobile, or blended – to use is an important decision facing every training designer.

Traditionally, researchers have evaluated the effectiveness of training methods by training outcomes, which range from trainee reactions about the training, learning outcomes, behavioral outcomes, and organizational outcomes (Kirkpatrick, 1954; Kraiger, 2002). Previous studies of training effectiveness by method have revealed that TDI and face-to-face training do not differ in effectiveness, while blended is often superior (Klein, Noe, & Wang, 2006; Means et al., 2013; Sitzmann, Kraiger, Stewart, & Wisher, 2006). No training method is clearly the most popular across organizations, either. Face-to-face training and computer-based training are both popular methods: they account for 51% of total organizational training hours and 41% of total training hours respectively (Ho, 2015). Additionally, 77% of American organizations currently offer online training to their employees, and this market is only expected to grow - 13% in the next two years (Corporate Learning Goes Digital, 2014). Only 2% of all organizational training hours involved mobile learning (Ho, 2015), yet the mobile industry is primed to explode: the industry is already a multibillion dollar industry and it is expected to grow another $3.5 billion by 2017 (Adkins, 2013).

There is some evidence that employees form training method preferences based on features of the training method. For example, in a corporate training pilot study, some employees preferred TDI for its time and location flexibility (Brown, Milner, Ford, & Golden, 2001), whereas Sitzmann et al. (2006) reported that trainees reacted more favorably to face-to-face training than blended training across the studies in their meta-analysis. Consequently, training methods are included in the present study due in part to the evidence that no method is clearly superior or worse or more popular than one another and in part because the judgments of trainees may be informative for uncovering whether training method effectiveness varies across individuals.

Course Content. Course content refers to the topic of a training program, which includes information about knowledge, skills, or abilities. Petridou and Spathis (2001) separated training content broadly into one of two categories: either social KSAs (e.g., interpersonal communication, management, leadership) or technical KSAs (e.g., how write formulas, create a database, etc.). While TDI unsurprisingly began by training information technology-related KSAs, it now includes communication, interpersonal skills, customer service, quality management, and a variety of other domains under its umbrella (DeRouin, Fritzsche, & Salas, 2005). Hence, it is likely that a trainee could receive social training delivered via a computer. Given the likelihood that any type of course content could be delivered via any training method (e.g., computer-based v. face-to-face), it is expected that course content will interact with the other contextual cues when participants make judgments about the different training scenarios. Petridou and Spathis found that participants with shorter organizational tenure most frequently signed up for social skills training whereas participants with longer tenure signed up for technical skills training. With respect to training content, it is expected in the present study that newly hired employees will prefer training about social KSAs and face-to-face training to network with other employees.

Groups. Teams are small groups of individuals who work together and share responsibility for projects that contribute to organizational outcomes (Sundstrom, De Meuse, & Futrell, 1990). Team effectiveness is thought to be partly increased by training in interpersonal communication and tasks that require a team to complete (Hollenbeck, Scott, & Guzzo, 2004, Sundstrom et al., 1990). Rico and Cohen (2005) found that virtual teams were most effective when there was a lot of communication for interdependent tasks and very little communication for independent tasks. While there may be very practical benefits to teams training together on team tasks, it is likely that these learners would always be assigned to team-based training.

Training in a group, however, still has benefits for learners and falls under the domain of trainee preferences. Kraiger (2008) lauded the benefits of learning in groups: trainees learn social skills as a byproduct of training and the group shares a consensus on the meaning of training materials and how to apply them. Disputing the bias against online learning, Redpath (2012) argued that online learning has always had a collaborative element and online learning excels when collaboration is included in the course design. Thus, not only is learning in groups important, but it is also important no matter the training methodology. It is unclear, however, whether trainees would prefer to be trained in groups, but findings in the team literature and thinking about group learning suggests that there may be benefits to this type of learning. Hence, group-based learning is included as a variable of interest in the current study.

<u>Tenure</u>. Tenure in the organization refers to how long a particular employee has been employed with an organization. Individual work outcomes such as job performance, organizational commitment, and frequency of organizational citizenship behaviors have been shown to increase in tandem with organizational tenure (Ng & Feldman, 2010; Ng & Feldman, 2011). That is, the more tenured an employee is in an organization, the more likely he or she will perform better, be more committed, and engage in more positive behaviors at work than a more junior employee. Training is one of the main processes by which employees accrue knowledge, skills, or abilities within an organization. If employees are trained as teams or in person, training can also provide a medium for social interaction and networking within the organization. Hence,

training may be one of the key avenues through which less tenured employees become more effective and efficient at their job, *and* become more connected to the organization, and exhibit more pro-social behaviors. Thus, training method preferences between untenured and incumbent employees may likely differ and may reveal insights into the type of training new employees value and why, which could have implications for their later performance, commitment, and pro-social behavior. Tenure, consequently, is included in the present study even though there is little prior research (Petridou & Spathis, 2001) linking it to training preferences. While there appears to be a link between training experiences and changes in a person over time (i.e., a person becomes more ingrained and knowledgeable partially as a result of training), there is little empirical evidence to point one way or another.

Training Cue Preferences

Policy capturing will be used to assess individual judgments about all possible training cue combinations. Specifically, the participant will read a training scenario, representing a specific combination of training cues that describe a training course, and make judgment ratings about how satisfied he or she would be with the course and how useful he or she believes the course to be. The resulting policies will then be linked to individual characteristics to assess whether preferences systematically vary across individual differences. Judgment ratings given by participants will be indicative of their preferences.

While training preferences have not been otherwise explicitly defined in the literature, the present study operationalizes preferences for different training scenarios in terms of satisfaction for training, which mimics how training courses are often evaluated by trainees in practice (Holgado-Tello, Moscosco, Barbero-Garcia, & Sanduvete-Chaves, 2006; Morgan & Casper, 2000). Training ratings will be measured as the usefulness and overall rating a trainee would give the training program, based on satisfaction scale development research conducted by Holgado-Tello et al. (2006). Intuitively, preferences for different training scenarios should vary across potential trainees. For example, a busy employee may prefer a training course that allows him or her to work at any time from a computer, as it would easily fit into his or her schedule. A new employee may find a classroom setting preferable, on the other hand, as it would allow him or her to meet coworkers in a collaborative setting. Thus, the training cues that compose the training scenarios are all distinct aspects of the training experience. It is therefore expected that information about each cue will influence the overall rating of a training scenario when controlling for the other training cues.

Hypothesis 1: Information on training methods, training content, training design, and organizational tenure will each explain unique variance in potential trainees' preference for a training course described in a scenario.

Decision-making research suggests that cues may interact with one another in a multiplicative manner, known as configural cue processing (Hitt & Barr, 1989). For example, Kristof-Brown, Jansen, and Colbert (2002) found that different types of fit interacted with one another in a policy-capturing study. The proposed training cues would seem to interact with one another in many ways – for example, a combination of a tenured individual and technical skills training may produce higher ratings together than either apart. Further, authors suggest social skills content and face-to-face training often co-occur (DeRouin et al., 2005). Configural cue analysis is distinct from the approach many take when evaluating cue processing, which is simply to add the effects of the cues together. It is expected that individuals will evaluate the provided training cues in a more complicated manner.

Hypothesis 2: Potential trainees will use configural cue processing when combining information on training methods, content, groups, and tenure to evaluate training scenarios.

Note that there is some construct overlap between training preferences and variables studied in the learning styles literature (see Pashler, McDaniel, Rohrer, & Bjork, 2008). Learning styles are stable personal attributes that predispose a person to learning better if they are taught in accordance to their learning style (Willingham, Hughes, & Dobolyi, 2015), but learning styles theory lacks much needed evidence to corroborate its frequent endorsements. There is little to no evidence that either learning styles or the match of learning style to instructional method predicts learner outcomes (Pashler et al., 2008).

If nothing else conclusive has emerged from that literature, it is that individuals hold a number of pervasive and entrenched beliefs about learning. Learners often believe they possess specific learning styles (e.g., Barbe, Swassing, & Milone, 1979; Kolb, 1984; Reichmann & Grasha, 1974) that, when taught in accordance with one's personal style, predisposes one to learning optimally. While the efficacy of being taught to one's learning style is highly questionable (Pashler et al., 2008; Willingham et al., 2015), in the case of training scenarios, however, there may be some currency to solely the *beliefs* about learning. That is, the training scenarios contain a number of influential cues – i.e., tenure, content, method, and groups – that potential trainees may believe influence their ultimate learning outcomes. These beliefs, or preferences, in turn, may influence either what courses or training formats trainees enroll in, as well as their motivation to learn going into a course. To be clear, I am not predicting preferences predict training success, but that they are related to other learner decisions such as course enrollment and motivation to learn.

Individual Differences that Influence Preferences

Preferences for training scenarios may differ across types of trainees. Trainees possess attributes that differentiate one from another and may predispose themselves to preferring different training scenarios.

Prior training experience. Prior training experience refers not only to the quantity of previous training a trainee has received but also the quality of the previous experiences and the saliency of those experiences. First, it is expected that preferences for future training based on prior training will function along the lines of the mere exposure effect (e.g., Zajonc, 1968). That is, participants will prefer training experiences that are similar to their prior experiences because of their familiarity with that method.

Second, given that training leads to improved cognitive and behavioral outcomes (Arthur et al., 2003), it is expected that as trainees experience improved job performance as a result of certain types of training, they will seek out training similar to their previous training experiences. A meta-analysis by Quinones, Ford, and Teachout (1995) found a positive link between work experience and job performance. Work experience referred to the range of tasks completed, how often a task was completed, and the difficulty of the task (Quinones et al., 1995). Training effectiveness is positively linked to behavioral evaluation criteria, i.e., job-related behaviors or performance (Kirkpatrick, 1954; Arthur et al., 2003) such as work experience. Hence, prior training experience is related to later work experience, which may influence the choices trainees make about future training. That is, a trainee who has enjoyed the benefits of training may seek out training in the future and seek out training that contains the training features of the prior training experience. Prior experiences are then expected to shape future decisions about training via mere familiarity and associations between training experiences and later job performance. Accordingly, prior training experience is included as a variable of interest in the current study.

Hypothesis 3: Potential trainees with more prior training experience (a broader range of methods and number of courses) will be more likely to combine information on training method, content, groups, and tenure by using interactive configural cue processing than will less experienced trainees.

Role stress. The amount of stress a trainee feels with respect to his or her job is also expected to influence training decisions. In this study, role stress was operationalized with measures of possible stressors an employee feels (Jex, Beehr, & Roberts, 1992): role ambiguity (i.e., the job description and expectations are not clear), role conflict (e.g., tasks are assigned that conflict with one another, two or more bosses give contradicting expectations or duties), and role overload (i.e., the employee has too many responsibilities, not enough time, etc.) (Kahn, Wolf, Quinn, Snoek, & Rosenthal, 1964). High role stress has been linked to negative work outcomes such as lowered job satisfaction and increased intentions to leave the organization (Schaubroeck, Cotton, & Jennings, 1989). Here, however, stressors are expected to affect training preferences in a very direct way; that is, the busier one is, the less time he or she has for training. Thus, trainees who report ambiguous, conflicting, or overwhelming work environments are expected to prefer training methods that fit into their schedule rather than training methods that are fixed in time and place, given that individuals who experience stressors attempt to reduce role requirements (e.g., Bacharach, Bamberger, & Conley, 1990). Training that can be completed at any time or any place, i.e., TDI or mobile training, is expected to be the preferred training method of employees experiencing these types of stressors. There is some support for this proposition. The designers of a corporate pilot study inquired about the preferences employees had for course delivered either in a classroom setting or a web-based setting (Brown et al., 2001). Trainees who preferred the web-based course commented that they liked the flexibility provided by the web course in terms of when they could access the training, how long they could engage in the training per sitting, and how long they could spend on each topic. Given that the flexibility provided by TDI has already been linked to preferences for TDI, it is expected that individual differences, such as stress, that necessitate flexibility will also predict preferences for TDI.

Hypothesis 4: Information about unrestrictive training methods (i.e., computer-based and mobile methods) will have a greater influence on preference ratings when potential trainees report high levels of stressors than when they do not.

Motivation to learn. Motivation to learn refers to describe how ready a person is to engage in training. If potential trainees are not motivated to learn during training, they will not learn effectively (Colquitt, LePine, & Noe, 2000). Heightened motivation to learn has been linked to positive course expectations (Sitzmann et al., 2009) and receiving training in a chosen course (Baldwin, Magjuka, & Loher, 1991), highlighting the need to understand potential trainees' preferences for future courses. Additionally, motivation to learn has been shown to explain training outcomes above and beyond other common predictors, such as cognitive ability (Colquitt et al., 2000), making it a valuable characteristic to assess prior to training.

Motivation to learn as also been linked to conscientiousness (Colquitt & Simmering, 1998; Colquitt et al., 2000) and internal locus of control (Colquitt et al., 2000) which suggests that individuals who are more motivated to learn may be more detail-oriented and self-managing, and ultimately more discerning in their training choices. Given that motivation to learn not only is an important variable to understand prior to training but also a contributor to how trainees choose training options, it is included in the present study. It is expected that those with high motivation to learn may consider details more closely than others when making training decisions.

Hypothesis 5: Potential trainees with higher motivation to learn will be more likely to combine information on training method, content, groups, and tenure by using interactive configural cue processing than will trainees with lower motivation to learn.

Age. Age refers to the chronological ages of the participants. Training performance has been shown to decline with age (Kubeck, Delp, Haslett, & McDaniel, 1996), highlighting the need to understand whether training preferences change with age. Performance is a function of both ability and motivation (Kanfer & Ackerman, 1989) suggesting that bolstering the motivation of older workers (by providing them training they prefer) could increase their training performance. Posthuma and Campion (2009) noted in their review of age-based stereotypes that perceptions of older worker performance might be negatively biased if the tasks they complete are technology-based. That is, people hold a belief that older workers struggle with technology. Younger workers in particular believe that older workers are technophobic (Finkelstein, Ryan, & King, 2013). If these stereotypes are true, it may be expected that older workers would prefer face-to-face training, where the need to interact with computers, mobile devices, or other technology-based systems is minimized. Contrary to prevalent age stereotypes, however, older workers have reported positive attitudes toward technology and eagerness to use TDI in some cases (Becker, Fleming, & Keijsers, 2012; Mitzner, Boron, Bailey Fausset, et al., 2010). Many common age-based stereotypes have likewise failed to accumulate empirical support (Ng & Feldman, 2012)

Older workers are, however, less willing to engage in training (Ng & Feldman, 2012). Therefore, it is important to explore age as a variable in training method preferences for two reasons. One, there is a lack of empirical support for age-based effects in work outcomes, yet beliefs about these unsubstantiated effects may be pervasive in organizations. Second, older workers seek out training and career development activities less often than workers of other ages (Ng & Feldman, 2012). Ng and Feldman (2012) suggested three reasons why this might be the case: older workers may avoid training due to increased learning difficulties associated with cognitive decline, older workers may be less interested in investing their time in themselves, or older workers may have less training opportunities offered to them by their organization due to age-based stereotypes which makes older workers more reluctant to seize available training opportunities. It might be expected that older workers will have lowered preferences toward training methods in general and that their preferences do not vary by training method. Given the potential for age to affect training preferences, participants' self-reported ages will be included as a variable of interest in this study.

Hypothesis 6: Satisfaction ratings for training scenarios will decrease as the age of potential trainees increase.

Capturing Trainee Judgments about Training

In summary, there are four major training methods that practitioners have at their disposal when designing a training program. These methods have differing features, effectiveness, and practicality that complicate a practitioner's decision-making process. TNA is a powerful tool at the disposal of practitioners. By assessing preferences for training method by work-related and individual characteristic factors in a needs assessment, a practitioner can anticipate the effectiveness of a variety of training scenarios. This will aid the practitioner in deciding which training method to use and under what circumstances each training method would be the most appropriate for his or her organization. In particular, this study examined preferences for different training methods, content, groups, and tenure. In addition, this study captured individual characteristics including prior training experience, job stress, motivation to learn, and age that may predispose groups of people to prefer certain training scenarios over others. Each participant rated each scenario on how useful he or she believed the training to be and his or her overall rating of the course.

This study used policy capturing (Hammond et al., 1986) to obtain judgments about multiple training scenarios. In policy capturing, multiple linear regression is used to model how individuals or groups of individuals evaluate information to provide a judgment about a given scenario. Scenarios are made up of cues, or variables that are believed to influence a person's judgment. After a participant rates each profile, the judgments are regressed on the cue variables in a within-subject multiple regression. Judgments that are modeled reliably indicate that a policy is captured. A review of policy capturing by Karren and Barringer (2002) reported a number of work related studies that make use of policy capturing. They also provided a number of recommendations for best practices in policy capturing studies.

Karren and Barringer (2002) first recommended that the presented scenarios be realistic; that is, the events or decisions could actually occur in a natural setting. Any information that can be provided to clarify the decision-making process should be provided. All training scenarios examined here are plausible combinations of cues. Each training method supports any type of content, number of people, and tenure in the organization. While some combinations may be better than others or individuals may prefer some combination over others, the current study does not expect anyone to believe that a given combination is unrealistic. Hence, the design of the policy capturing was a full factorial cross of the cues. That is, every possible combination of the cues was provided to the participants.

Four dimensions of training method preferences were manipulated in a 4x2x2x2 within-subjects factorial design (32 total scenarios). Full factorial designs that contain many scenarios may cause fatigue and stress in participants, leading to poor data (Karren & Barringer, 2002). Since this design only contained 32 scenarios, this was not a concern here. As a policy capturing design is within-subjects, the number of scenarios rather than the number of participants is important for power.

In addition to using a policy capturing design, this study also collected measures of individual differences in prior training experience, role stress, motivation to learn, and age. The study examined the differences in training method preferences between groups of participants, as defined by the prior measures.

METHOD

Participants

281 responses to the survey instrument were initially collected. Of these, 108 responses were retained. Participants were removed from the study first by checking a screening criterion, next by checking for substantial missing data, then by checking for failure to respond appropriately to attention checks, and finally by checking for invariant responses. 39 individuals reported that they had never taken an organizational training course, so they were removed from the study. 58 individuals responded to less than 2/3rds of the scenarios and were removed from the study. To pass an attention check, participants were required to respond a certain way to two messages embedded in the survey instrument (detailed later). 67 individuals failed these attention checks and were removed from the study. Finally, the standard deviation for scenario ratings were calculated and the number of response options used were counted. Individuals were removed from the study if their responses were two or more standard deviations below the mean of standard deviations for rating scenarios or if they used two or fewer response options to rate the scenarios. Nine individuals were removed this way, resulting in the final sample size of 108.

The sample was primarily female (59.3%). Sixty-one percent were White, 12.6% were Asian or Pacific Islander, 3.1% were Multiracial, 2.4% were each Black or Other, 1.6% were Hispanic, and approximately 1% were Native American. The average age was 36.9 years old (*SD* = 12.2, ages ranged from 18 to 65). Per the screening criterion, all participants had taken organizational training prior to taking the survey. Over half the sample (54.3%) reported taking either face-to-face or computer-based training, 49.6% reported taking blended training, 26.8% reported having been mentored, and 7.1% reported taking mobile training. Eleven percent reported taking a training method not specified. Participants reported working about 40 hours a week on average (N = 108, M = 40.53, SD = 10.04) and being employed with their current organization about six and half years on average (N =108, M = 6.63, SD = 6.32). The sample was obtained through a convenience sampling method that required students in an online Master's level industrial organizational psychology course to recruit participants as part of a class project. Additionally, students in an online management course and online organizational psychology course could recruit participants in exchange for extra credit.

Materials

Karren and Barringer (2002) recommended that an ideal ratio of ten scenarios to a single cue and recommended no less than five scenarios to a single cue. The ratio in this study was eight scenarios to a single cue, which was well within the acceptable limits.

Descriptions of the cues were based on existing definitions from the literature (training methods - Banna, 2014; Cross, 2004; Furio, Juan, Segui, & Vivio, 2014; Means et al., 2013; training content - DeRouin et al., 2005; Petridou & Spathis, 2001; group learning – Sundstrom et al., 1990; organizational tenure – Ng & Feldman, 2010) and written in a way to highlight the most salient features of each training cue. Cue descriptions were bulleted in each scenario and key words in each cue description were bolded. See Appendix A for a list of the cues and an example scenario.

Training scenarios were developed by fully crossing all levels of the four cues. The four cues and their levels of measure included training method (face-to-face, TDI, mobile, or blended), content (human skills or technical skills), learning number (whether training takes place individually or as a group), and tenure (whether the trainee is a new hire or an incumbent in the organization). Thus, all participants rated 32 scenarios. Four additional scenarios were included: a bogus scenario that asks participants to rate the scenario a certain way (see insufficient item responding) and three duplicate items to assess rater consistency (Hammond, Stewart, Brehmer, & Steinmann, 1975), bringing the total number of scenarios to 36.

Consistency in ratings within subjects was calculated using the formula provided by Hammond, Stewart, Brehmer, & Steinmann (1975): taking the square root of the difference between the total variance in a participant's rating minus the variability in their rating of the duplicate scenarios divided by their total variance. Average consistency was within acceptable limits ($\alpha = .76$), which indicated that participants rated scenarios using stable policies.

Two pilot tests were conducted to assess whether the cue levels manipulated in the scenarios were sufficiently clear and to assess the time it took to complete the survey instrument. Every participant in the pilot tests correctly identified the cue level that corresponded to each description. Additionally, there were no statistically significant differences between the average survey completion time among the pilot testers and the participants in the study. One change was made to the scenario descriptions as a result of the pilot testing: key words or phrases were bolded to make the features of the scenarios more apparent.

Procedure

Participants read a short explanatory paragraph prior to reading the training scenarios. The explanation was intended to ease the decision-making process to follow by providing as much information about the scenarios before the policy capturing evaluation and hold constant some information across scenarios, per Karren and Barringer's (2002) recommendations. The paragraph read:

> Imagine you are in an organization that routinely offers training through a variety of training methods. In some of the following scenarios, you will be asked to imagine that you either just joined the organization or you have been a part of the organization for a while. You have the ability to choose from a variety of week-long training programs that

> train either human skills (e.g., communication skills) or technical skills (e.g., using computer software), and you can take these training programs by yourself or with your team (please assume that your team would be equally willing to take the training as you are). Please read the following training scenarios carefully and decide which ones appeal the most to you. Pretend you are actually deciding which training you would like to take the most when making your ratings. Thank you very much in advance for your attention.

Participants received a link to the survey hosted on Qualtrics.com from a friend, colleague, or family member per the recruiting method detailed in the participant section. After reading a consent form and instructions, the participants saw the 36 scenarios in a randomized order. The order of scenarios was randomized using atmospheric noise from random.org, scenarios were inserted into six blocks with each containing six scenarios, and the order of those blocks were randomized for each participant. This process was used to reduce potential fatigue effects: Qualtrics cannot currently randomize items across blocks so the only truly random method required all 36 scenarios to be presented at once.

After rating the scenarios, the participants responded to measures of motivation to learn, role stress, role ambiguity, role conflict, and prior training experience; the order of the measures and items were randomized for each participant. Finally, the participants completed a basic demographic measure.

Fatigue effects were tested for by comparing the variance explained in ratings for the first 18 scenarios a participant saw with the last 17 scenarios a participant saw (Judge & Bretz, 1992; the attention check scenario was removed prior to analyses). A statistically significant decrease in the variability of the second set of ratings would be indicative of participants' fatigue. A one-way ANOVA was conducted to assess the differences in rating variability between the first 18 ($N = 108$, $M = 0.75$, $SD = 0.13$) and last 17 scenarios ($N = 108$, $M = 0.76$, $SD = 0.12$); the two sets of ratings were not significantly different, $F(1, 214) = 0.05$, $p = 0.81$. Note the mean here reflects the standard deviation of all the ratings of all participants. Participants did not lose variability in their rating policies over the course of the survey instrument.

Measures

All study measures are described below and are provided in full in the appendices. Intercorrelations between all individual difference variables, including scenario ratings, are provided in full in Table 1 along with internal consistencies, where applicable.

Demographics. Participants were asked to report their age, gender, ethnic background, education, organizational and job tenure, and job type. See Appendix B.

Training scenario ratings. Reactions to the training scenarios, which is defined as the usefulness of the training scenario and overall rating of the training scenario, were measured by three items. The three items were adapted from Holgado-Tello et al.'s (2006) Training Satisfaction Rating Scale that comprised the usefulness and overall rating factor of their measure. Language was changed in the items to be prospective rather than reflective as reflected in these items: "The training would be useful for my specific job," "The training would be useful for my personal development," "The training would merit a good overall rating". Responses were rated on a five point Likert-type scale (1 = strongly disagree, 5 = strongly agree), with higher scores representing higher usefulness and total rating. Three items were selected due to the importance of brevity in a policy capturing study but maximize the reliability of the measure. Holgado-Tello et al. reported an internal consistency of .89; reliability was not calculated for scenario ratings. Ratings across all participants and scenarios were slightly positive with good variability (N = 108, M = 3.61, SD = 1.05). See Appendix C.

Prior training experience. Prior training experience, defined as the quantity of training courses taken, the type of training method a person has taken before, and the quality of that experience, were measured by five items created for this study. See Appendix D. These items are discussed below.

Two items asked how many training courses a participant has taken in their career and within the past year. Responses were forced to be solely numeric. Participants reported taking many courses over their career, $N = 108$, $M = 33.22$, $SD = 44.32$. Within the past year, participants also indicated taking a number of courses, $N = 107$, $M = 3.33$, $SD = 4.16$.

Participants were asked to indicate which types of training courses that they have taken, including classroom-based, computer-based, mobile, and blended courses. The item asked, "Of the training courses you have taken in your career, were any of them (please select all that apply):" Answers include "only in a classroom," "only with one other person," "only on the computer," "only on a mobile phone, tablet, etc.," "both in a classroom and on a computer," or "other". Branch logic was used to selectively display or hide follow-up questions based on the type of training a given participant has taken.

Training course quality, defined as the extent to which a person thought a course was a positive or negative experience and the likelihood they would take a similar course, were measured with two items. Participants were asked about the quality of their previous training experiences, using the same training satisfaction rating scale items that the respondents used to rate the scenarios. Participants reported much experience with prior training methods (Computer-based: $N = 69$, $M = 3.53$, $SD = .93$; Classroom: $N = 69$, $M = 4.18$, $SD = .57$; Blended: $N = 63$, $M = 4.23$, $SD = .59$; Mobile: $N = 9$, $M = 4.04$, $SD = .2$). Reliability was good across all training methods (Computer-based: $\omega = .905$; Classroom: $\omega = .821$; Blended: $\omega = .842$; Mobile: $\omega = .947$).[1]

[1] Coefficient omega (ω) was used as the measure of internal consistency in this study, following the recommendation of Raykov & Marcoulides (2011). Omega is more robust against inflation due to sample size, less

Role stress. Role stress was measured by a scale adapted from three scales measuring role overload, role conflict, and role ambiguity. Each scale has strong conceptual grounding in its parent construct and have remained popular choices for measuring its respective construct in studies. See Appendix E.

Role overload, defined as the extent to which a person has time to complete his or her job tasks, was measured with a scale based on three items from Schaubroeck, Cotton, and Jennings (1989) and Beehr, Walsh, and Taber (1976) used in Bolino and Turnley (2005). An example item is, “The amount of work I am expected to do is too great.” Responses were rated on a seven point Likert-type scale (1 = strongly disagree, 7 = strongly agree), with higher scores representing greater role overload. Bolino and Turnley (2005) reported an internal consistency of .84; the internal consistency in this study was similar (ω = .89) and the items fit well to one factor, χ^2 (0) = 0, RMSEA = 0, CFI = 1, TLI = 1. Participants generally reported overload levels in the middle of the response range, N = 108, M = 4.14, SD = 1.65.

Role conflict, defined as the extent to which others make competing demands on a person, were measured with four items from the Role Conflict Scale (as used in Bacharach et al., 1990). An example item is “My subordinates make conflicting demands on me.” Responses were rated on a seven point Likert-type scale (1 = strongly disagree, 7 = strongly agree), with higher scores representing greater role conflict. Bacharach et al. reported an internal consistency of .87. Due to initial poor fit (χ^2 (2) = 5.74, RMSEA = .128, CFI = .97, TLI = .911), item 2 was dropped, resulting in a better fit to one factor, χ^2 (0) = 0, RMSEA = 0, CFI = 1, TLI = 1. The internal consistency in this study was lower (ω = .76). Again, participants typically reported conflict levels in the middle of the response range, N = 108, M = 4, SD = 1.45.

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affected by group homogeneity, and a better indicator of true score variance than coefficient alpha (α). Conveniently, the coefficient value can be interpreted the same way in either omega or alpha.

Role ambiguity, defined as the extent to which a person is uncertain when or how to do his or her job, was measured with the nine item Role Ambiguity Scale (Breaugh & Colihan, 1994). An example item is “I know how to get my work done.” Responses were rated on a seven point Likert-type scale (1 = strongly disagree, 7 = strongly agree), with higher scores representing less role ambiguity. Breaugh and Colihan reported an internal consistency of .91. Due to initial poor fit (χ^2 (27) = 210.969, RMSEA = .235, CFI = .78, TLI = .707), items were dropped iteratively until good fit was achieved. Items five, three, six, and nine were dropped from the scale, which led to an improved fit of the items to one factor, χ^2 (5) = 12.7, RMSEA = 0.119, CFI = .975, TLI = .95. Internal consistency was similar to Breaugh and Colihan (ω = .90). Participants generally reported high levels of role ambiguity, *N* = 108, *M* = 2.25, *SD* = .9.

<u>Motivation to learn</u>. Motivation to learn was measured with three items based on the work of Noe and Schmitt (1986) as used in LePine, LePine, and Jackson (2004) with slight modifications for this study. The items are, "In general, I exert considerable effort to learning the materials during training," “In general, I try to learn as much as I can from training,” and “In general, I am motivated to learn the skills emphasized in training.” In this study, these items were modified to use “training” in place of “my courses,” to emphasize the organizational training context. Responses are rated on a five-point Likert-type scale (1 = strongly disagree, 5 = strongly agree) with higher scores representing higher motivation to learn. LePine et al. reported an internal consistency of .71; the internal consistency in this study was improved (ω = .91) and the items fit well to one factor, χ^2 (0) = 0, RMSEA = 0, CFI = 1, TLI = 1. Motivation was high on average across participants, *N* = 108, *M* = 5.77, *SD* = .95. See Appendix F.

Age. Age, defined as a person's chronological age in years, was collected from self-reported demographic information. The average participant was middle-aged, but age was highly variable across participants, *N* = 91, *M* = 36.9, *SD* = 12.2.

Insufficient Effort Responding. Insufficient effort responding refers to response patterns exhibited by participants who do not carefully read instructions or adopt random or predictable methods of indicating scores to a set of items. The extent to which participants are motivated and attentive to faithfully read direction and respond to items is a general concern for research, but for online samples in particular (Huang, Liu, & Bowling, 2014). Given that this study both used an online sample and asked participants to respond to a number of measures and training scenarios, items were inserted into the measures and scenarios to detect whether participants were paying attention, following the recommendations of Huang, Curran, Keeney, Poposki, and DeShon (2011). Two items were included in the survey instrument. The first item was inserted into the role stress scales. It read, "This statement should be rated a two and a five." The item was consistent with the length of the other items, so as to not draw attention to itself. The item asked participants to rate the item in an otherwise impossible manner (i.e., provide two scores on the same response scale). The second item was inserted into the training scenarios. It was a bogus training scenario that read:

- You are a **new hire** within an organization.
- This **training course** is fictitious. This scenario is checking to see whether you're paying attention.
- If you are, ignore the rest of **this scenario** and do not rate this scenario.
- You will be responsible for learning **mastering the material yourself**, although other individuals may be enrolled in the same course.

The training scenario began and ended with cue statements that were consistent with the other scenarios. The directions were inserted within the scenario, so the change should not be easily detectable except through attentive reading, and again the directions asked participants to perform an unusual action: do not rate the scenario. Response patterns to these two items were used to check whether participants were carefully reading the items and scenarios present within the survey instrument. Participants who failed to respond appropriately to these items were likely not paying careful attention while completing the rest of the survey. Since clear and consistent judgments are vital for policy capturing, participants who missed these items were removed from the final analyses. See Appendix G.

RESULTS

Descriptive statistics and correlations for all measures are included in Table 1. Hierarchical linear modeling (HLM) was used to analyze a data structure in which components of a training scenario (level 1) were nested within various individual difference measures (level 2). Model testing proceeded in five phases: an unconstrained (null) model, a random intercepts model, means-as-outcome model, intercepts- and slopes-as-outcomes model, and a revised random intercepts model in which interaction terms were calculated between all cue variables and added to the within-subjects part of the model.

Level 1 Analysis

Hypothesis 1 predicted that all the training scenario cues would significantly explain variance in scenario ratings. To determine the amount of variance the scenario cues and individual difference variables could explain in the dependent variable, a null model was calculated first using MPlus (Muthén & Muthén, 2015). The null model includes only the dependent variable at both levels of the analysis to determine how much variance exists within subjects and between subjects. The intercept-only model revealed an interclass correlation (ICC) of .261; 26.1% of the variance in training scenario ratings was between-subjects and 73.9% of the variance in training utility ratings was within-subjects. Because variance existed at both data structure levels, predictors were individually added at each level.

The random intercepts model was tested using tenure, training content, training method, and groups as predictors of scenario ratings. To determine how much variance the predictor variables explained in the dependent variable, the within-subjects variance of the null model was compared to the within-subjects variance of the random intercepts model by subtracting the variance of the random intercepts model from the variance of the null model and dividing by the null model. This effect size (see Table 2) indicated that the cue variables accounted for approximately 42% of the explainable variance in the scenario ratings.

The regression coefficients for all within-subject predictors are reported in Table 2. The average intercept differed significantly from zero for scenario ratings, $b = 3.693$, $t(108) = 43.695$, $p < .01$. Notably, all the regression coefficients for training method cues were significant: computer-based training had a negative effect on ratings compared to blended training, $b = -0.184$, $t(108) = -3.75$, $p < .01$; classroom training had a positive effect compared to blended training, $b = 0.249$, $t(108) = 3.768$, $p < .01$; and mobile training had a negative effect on ratings compared to blended training, $b = -.305$, $t(108) = -5.083$, $p < .01$. All other within-subject predictors were insignificant. Scenario ratings were higher when training was classroom-based compared to blended and lower when training was computer-based or mobile compared to blended, partially supporting the first hypothesis. 26.1% of the variance remained between-subjects, which was subsequently modeled with level 2 predictors.

Level 2 Analysis

Next, the means-as-outcomes model added age, motivation to learn, prior training experience in training methods (classroom, computer, blended, and mobile), role overload, role conflict, and role ambiguity as level-2 predictors to the model. These variables were centered prior to their addition to the model. Regression coefficients for between-subject predictors are reported in Table 3. The regression coefficient for MTL was positive and statistically significant, $\beta = 0.124$, $p < .05$; as were coefficients for prior classroom training ratings, $\beta = .208$, $p < .05$, prior computer-based training ratings, $\beta = .142$, $p < .05$, and prior blended training ratings, $\beta = .46$, $p < .01$. Scenario ratings were higher for both individuals with higher motivation to learn and individuals with previous, positive experiences with classroom, computer, and blended courses.

Hypothesis 4 predicted that participants who reported high levels of stressors would be more likely to prefer computer-based or mobile courses. To determine whether this was the case, interactions between within-subject predictors and between-subject predictors were tested with the intercepts model and slopes-as-outcomes model. Regression coefficients for these interactions are reported in Table 4. Neither role overload, role conflict, nor role ambiguity significantly interacted with the training method cues to produce scenario ratings, failing to support the fourth hypothesis. A number of between-subject predictors did significantly interact with the within-subject predictors, however.

In the equation for content, ratings for prior mobile training were significantly and negatively related to the variance in the slope for scenario ratings, $\gamma = -0.962$, $p < .01$, indicating that individuals placed less emphasis on human skills content compared to technical skills content when they had positive previous mobile training experience when rating scenarios. In the equation for computer-based training, ratings for prior mobile training were significantly and negatively related to the variance in the slope for scenario ratings, $\gamma = -1.063$, $p < .01$, indicating that individuals placed less emphasis on computer-based training compared to blended training when they had positive previous mobile training experience when rating scenarios. For classroom-based training, ratings for prior computer-based training were significantly and negatively related to the variance in the slope for scenario ratings, $\gamma = -0.32$, $p < .01$, indicating that individuals placed less emphasis on classroom-based training compared to blended training when they had positive experiences with prior computer-based training when rating scenarios. Finally, for mobile training, ratings for prior mobile training were significantly and negatively related to variance in the slope for scenario ratings, $\gamma = -1.035$, $p < .01$, indicating that individuals placed less emphasis on mobile training compared to blended training when they had prior positive experiences with mobile training when rating scenarios. These results indicate that prior experience in different training methods informed utility ratings for future training methods and content.

Configural Cue Processing Analysis

Hypothesis 2 predicted that information about the scenario cues would interact multiplicatively when participants rated scenarios. Until this point, all the models tested have included only the main effects for the within-subject predictors. To test whether the cues interacted with one another, the random intercepts model was revised to include calculated interaction terms between all levels of the within-subject predictors. The *t* tests conducted in the model (see Table 5) indicated that a number of the interactions were significantly related to scenario ratings. A two-way interaction between tenure and content interacted such that participants rated scenarios with new hires and human skills content lower than scenarios with tenured employees and technical skills content, $b = -.206$, $t(108) = -2.163$, $p < .01$. A two-way interaction between tenure and groups interacted such that participants rated scenarios with new hires and individual learning lower than scenarios with tenured employees and group learning, $b = -.314$, $t(108) = -2.269$, $p < .01$. A three-way interaction between tenure, groups, and computer-based training interacted such that participants rated scenarios with new hires, individual learning, and computer-based training higher than scenarios with tenured employees, group learning, and blended training, $b = .326$, $t(108) = 1.944$, $p < .05$. A four-way interaction between tenure, content, groups, and computer-based training interacted such that participants rated scenarios with new hires, human skills content, individual learning, and computer-based training lower than scenarios with tenured employees, technical skills content, group learning, and blended training, $b = -.465$, $t(108) = -2.028$, $p < .05$. A four-way interaction between tenure, content, groups, and computer-based training interacted such that participants rated scenarios with new hires, human skills content, individual learning, and classroom-based training lower than scenarios with tenured employees, technical skills content, group learning, and blended training, $b = -.465$, $t(108) = -2.028$, $p < .05$. Given the number of significant interactions, with emphasis on the four-way interactions, the results support the second hypothesis.

Hypotheses 3 and 5 predicted that participants would consider the cues multiplicatively more so when they had more prior training experience and were more motivated to learn, respectively. To test these hypotheses, a quartile split was performed on the number of career courses a participant reported having and again on participants' motivation to learn. A quartile split was used in order to model interactions at different levels of experience and motivation to learn, and it is a tactic that has been used to address similar hypotheses in the past (Kristof-Brown et al., 2002). The interaction models were retested on these eight subgroups. The results of these models are summarized in Tables 6 and 7.

Contrary to the hypothesis that more interactions would occur as prior training experience increased, individuals with the least experience considered cues multiplicatively the most and individuals with the most experience considered cues multiplicatively the least. Please note these beta weights represent differences between the stated cues and the reference groups, mentioned earlier and in the tables. For concision, the reference groups are omitted from the reporting here. For participants with the least experience (Quartile 1), there were four significant interactions: between individual learning and mobile training, $b = .568$, $p < .01$; new hires, individual learning, and mobile training, $b = -.747$, $p < .01$; human skills content, individual learning, and mobile training, $b = -.555$, $p < .05$; and new hires, human skills content, individual learning, and mobile training, $b = 1.055$, $p < .01$. For those in Quartile 2, there were five significant interactions: between new hires and individual learning, $b = -.744$, $p < .01$; new hires, human skills content, and individual learning, $b = 1.019$, $p < .05$; new hires, human skills content, individual learning, and computer-based training, $b = -.972$, $p < .05$; new hires, human skills content, individual learning, and classroom-based training, $b = -1.282$, $p < .01$; and new hires, human skills content, individual learning, and mobile training, $b = -1.151$, $p < .01$. For those in Quartile 3, there were three significant interactions: between new hires and human skills content, $b = -.467$, $p < .01$; new hires and individual learning, $b = -.467$, $p < .05$; and new hires, human skills content, and classroom-based training, $b = .497$, $p < .05$. Among the most experienced participants (Quartile 4), there was only one significant interaction: between human skills content and classroom-based training, $b = .651$, $p < .05$. Given the loss of interactions as experience increased, these results fail to support the third hypothesis.

The number of significant interaction terms increased with motivation to learn across three of the four quartiles. For participants with the least motivation to learn (Quartile 1), there were no significant interactions. For those in Quartile 2, there were three significant interactions: between new hires and computer-based training, $b = .332$, $p < .05$; human skills content and computer-based training, $b = .574$, $p < .05$; and new hires, human skills content, and computer-based training, $b = -.605$, $p < .05$. For those in Quartile 3, there were six significant interactions: between new hires and human skills content, $b = -.354$, $p < .01$; new hires and individual learning, $b = -.505$, $p < .01$; new hires and computer-based training, $b = -.425$, $p < .05$; new hires, human skills content, and individual learning, $b = .676$, $p < .05$; new hires, individual learning, and computer-based training, $b = .677$, $p < .01$; and new hires, human skills content, individual learning, and computer-based training, $b = -.99$, $p < .01$. Yet, among the most motivated to learn (Q4), there were no significant interactions. While interactions increased as motivation to learn increased across three quartiles, the results only partially support hypothesis 5.

Regression Analysis

Hypothesis 6 predicted that scenario utility ratings would decline as age increased. To test this hypothesis, a simple linear regression was conducted to assess whether average rating scores ($N = 3456$, $M = 3.61$, $SD = 1.05$) declined with age ($N = 91$, $M = 36.9$, $SD = 12.2$). The results indicated that age did not predict rating scores, $F(1, 2910) = 1.027$, $p = .311$, $r^2 = 0$. The results indicated that scenario rating scores did not decline with age. Age and rating variance ($N = 108$, $M = .90$, $SD = .26$) was also tested. Likewise, the results indicated that age did not predict rating variance, $F(1, 89) = .527$, $p = .47$, $r^2 = .006$. These results fail to support hypothesis 6; neither rating scores nor variance declined with age.

DISCUSSION

Training research often neglects to study training needs assessment (Arthur et al., 2003; Ferreira & Abbad, 2013), despite both researchers and practitioners recommending it as a best practice (Dierdroff & Surface, 2008; Goldstein, 1980; Kraiger, 2003; Kraiger & Culbertson, 2012; McGehee & Thayer, 1961; Surface, 2012). Researchers have claimed that TNA lacks the preexisting theoretical models and empirical methods that make other topics more appealing to study (Ferreira & Abbad, 2013), which results in little attention given to TNA. Arguably, there is little incentive for researchers to develop those foundations within the TNA literature. Assessing needs is a largely applied practice, even among the generally applied practices contained within industrial-organizational psychology, which raises the question of whether the practice therefore does not require TNA-focused theories or research methodologies.

More recently, however, researchers have raised concerns that training practices are deficient because practitioners do not assess needs consistently or comprehensively (Reed & Vakola, 2006; Van Erde et al., 2008) and researchers have neither addressed newer training methods nor the increased attention put upon the individual in training (Kraiger, 2003; Surface, 2012). Thus, a need exists in the literature to answer these questions along with a corresponding need for a method to assess these types of questions. Without strong theoretical guidance available (for a review, see Ferreira & Abbad, 2013), the current study operated under the assumption that if experienced trainees preferred different types of training, and preferences varied across participants, preferences like these could be used in many ways: To tailor training to individuals, to design organizational training courses based on the average preferences of the organizational members, or to support inexperienced or unmotivated trainees.

Consequently, the present study addressed the call for more research on TNA by employing empirical approaches novel to the practice, policy-capturing (Hammond et al., 1986) and hierarchical linear modeling (HLM; Bryk & Raudenbush, 1992), to assess as-of-yet unstudied variables in the TNA literature: individual preferences and group-level differences in preferences for different aspects of the training experience. The method and results of this study are complex. As this study was equally as much about the problem it addressed as the way it addressed the problem, it is useful to discuss both the method and results in tandem.

Policy capturing. The strength of the policy capturing design used here is that participants: (a) weighed ten different levels of four experimentally manipulated variables, (b) observed each level either 8 or 16 times, (c) completed a number of self-report measures, and (d) did so in less than 30 minutes on average. Policy capturing can be thought of as an experiment in which a single participant is his or her own control: scenario ratings are manipulated by exposing participants to every possible combination of the experimental cues. A participant weighed these cues when rating each scenario, the pattern of which is referred to as the policy, which revealed underlying preferences for single cues or combinations of cues. While the design requires more forethought than a simple survey (Karren & Barringer, 2002), the ratings provide rich data without requiring a large sample size.

Training scenario ratings. Participants, who on average reported working fulltime, being with their organization for at least six years, and taking over 30 training courses across their career, were asked to rate scenarios on how useful the training would be for them and for their job and to give an overall rating to the scenario (Holgado-Tello et al., 2013). The "preferences" discussed throughout this section refer to these averaged ratings; a preference is also analogous to a judgment, which is the more common term in policy capturing. By themselves, preferences are vague. It is not clear, for example, why a participant rated a scenario more highly than another, what aspects of a scenario a participant valued, or what factors contributed to those ratings compared to others. Most common statistical techniques model variance within subjects or between subjects, but these techniques cannot handle nested data, like scenario ratings nested within individual characteristics, or model interactions between levels of data, which, to Ferreira and Abbad's (2013) point, limits the ability for researchers and practitioners to systemically evaluate comparisons of large amounts of training options.

Hierarchical linear modeling. Broadly, multilevel modeling techniques have existed for a few decades but have been only applied to industrial organizational psychology questions recently (Aguinis, Pierce, Bosco, & Muslin, 2008; Costa, Graça, Marques-Quinteiro, Santos, Caetano, & Passos, 2013; Hitt, Beamish, Jackson, & Mathieu, 2007; Klein & Kozlowski, 2000). HLM can be thought of as a way of disambiguating preferences by attributing the changes in preferences, or rating scores, to the cue manipulations, individual characteristics, and interactions within cues and between cues and individual characteristics. This method has the advantage of modeling all of these effects without losing degrees of freedom by running multiple regressions (Bryk & Raudenbush, 1992), hence it was used to evaluate preferences at multiple levels.

Within subject ratings. These preferences were first regressed onto the cues. As a reminder, the cues were: whether the trainee was a new hire or tenured employee, whether the training content taught human or technical skills, whether the training method was classroom-based, computer-based, a blend of the two, or mobile-based, and whether the learning occurred individually or as part of a group. It was hypothesized that each of these cues would affect the ratings participants made; however, the only cue to have a main effect on scenario ratings within subjects was training method: information about classroom-based training positively affected ratings the most, then blended, then computer-based, and finally mobile-based.

To the author's knowledge, this is the first systematic comparison of preferences for training methods. While past research and guidelines have praised technologically-driven methods for their low cost and ease of delivery (e.g., Strother, 2002), part of the reason classroom-based training maintains a large share of the training ecosystem is simply because people prefer it, holding all else constant. Nevertheless, practitioners are cautioned to accept these results as-is, given that individual characteristics have not yet been accounted for.

<u>Between subject ratings</u>. Scenario ratings were also regressed on a variety of individual characteristics: motivation to learn, age, role stress, and ratings of prior training method experiences. Unsurprisingly, motivation to learn was positively related to scenario ratings (Klein et al., 2006). It was expected that scenario ratings would decline with age due to older workers declining inclination to participate in training (Ng & Feldman, 2012); however, age had no effect on scenario ratings, providing evidence to those who wish to dispel aging stereotypes in organizations (e.g., Hedge, Bormann, & Lammlein, 2006).

It bears mentioning that this study took place online and therefore could have selected out older individuals who are less inclined to use a computer. While possible, the sampling method used in this study may have averted some of those effects by obtaining a wide variety of working and previously trained participants through a network of friends, family members, and colleagues. To clarify, it is unlikely that there is a large intersection of working, older adults for whom computer use, and therefore eligibility in this study, is not a daily part of work. As far as decisions about training are concerned, age appears to be immaterial to the decision-making process. Older workers are no less interested in training in general or in technology-based training specifically than their peers.

Ratings of prior classroom-based, blended, and computer-based trainings were all positively and significantly related to the current ratings[2], but past blended ratings had nearly twice the effect on ratings than did classroom ratings, the next highest effect. Past research has noted that students and trainees react positively to blended methods and perform well in these learning environments (Garrison & Kanuka, 2004; Means et al., 2013), which may translate into the heightened optimism for future training seen here based on these positive, past experiences. It is not clear from this model alone, however, whether these prior experiences changed how participants viewed the cues in the scenarios.

Interactions between cues and individual characteristics. HLM can compute whether interactions occur between levels of data; in this case, HLM was used to determine whether participants' individual characteristics affected how they weighed the cues when rating the scenarios. Prior training experience with computer-based and mobile courses interacted significantly with information about every training method cue such that participants with previous, positive experiences with either technologically-based method invariably preferred blended courses over every other option. If they did not, they preferred classroom-based training. Previous research has connected past training experiences to future training expectations (e.g., Sitzmann et al., 2009), so the arc of these results is not unexpected. What is important to note, however, is how past experience shaped future preferences.

In short, training designers would do well to note that: (a) Holding all else equal, classroom-based training is the most preferred method, but (b) past experience impacts future

[2] Prior mobile-based training ratings were also positively related to current ratings but too few people had prior experience to have a significant relationship with the current ratings.

expectations, so (c) accounting for prior experiences, positive prior experience with technology-driven training increases preferences for future technology-driven training, yet (d) positive experience with classroom-based training does not increase preferences for future classroom-based training; instead, classroom-based training appears to become preferred when previous experiences with technology-driven training are negative, and (e) past experience blended training had, by far, the largest positive effect on ratings for future training.

Stress. It was expected that participants who reported high levels of stressors would be disposed to preferring less restrictive training methods, namely computer-based or mobile training. Neither participants' levels of role overload, role conflict, or role ambiguity affected how they viewed the cues. Rather than presume that one's levels of stressors has little to no effect on training decisions, it may be that neither the instructions nor the cue descriptions were written with language strong enough to induce feelings of time or location constraint in participants. Were participants given a similar survey as part of a real training design, with stronger language about the commitments associated with each training method, stress may have more strongly influenced ratings. It may also be the case that measures of strain, e.g., satisfaction, anxiety, frustration, depression, and withdrawal intentions (Jex et al., 1992), would have been more appropriate predictors of training preferences than stressors. Presence of stressors do not necessarily indicate that an individual is stressed whereas (Jex et al., 1992). Future research should consider operationalizing stress in this manner, in either a study with a similar design to this one or the preceding hypothetical study.

Configural cue processing. Participants were also expected to combine information about cues in a process known as configural cue processing (Hitt & Barr, 1989) when rating the scenarios. In contrast to the effects discussed so far, configural cue processing concerns the multiplication of cues to assess whether combinations of cues affected ratings. While not every interaction term was significant – and, to be clear, this was not the expectation – many interaction terms were significant. These interaction terms are very informative about training preferences. Participants tended to prefer scenarios that included tenured employees, technical training (corroborating Petridou & Spathis' 2001 findings), group learning, and blended learning over other options. These effects were often larger than the within subject main effects, as well.

Differences in cue processing across individual characteristics. These interactions were also modeled across proportional levels (quartiles) of motivation to learn and the amount of prior training experience a participant reported. Participants generally combined cues more frequently the higher their motivation to learn was, as expected, except the participants with the highest motivation to learn. No interaction terms within this group significantly explained variance in the scenario ratings. The participants in the most highly motivated to learn group also rated every scenario the highest on average. It is likely that the range of scenario ratings was restricted to only the higher end of the rating scale, which limited the variance that the interaction terms could have explained. Thus, the unexpected results are likely a measurement artifact rather than a loss of effect.

Contrary to expectations, the most experienced participants produced the fewest interactions while the least experienced participants produced the most. It may be the case that the least experienced participants paid the most attention to the scenarios, perhaps because they had less experience to rely upon, and therefore rated scenarios with the most consideration; likewise, experienced participants may have fixated on single cues they believed to be the sole contributors to their prior positive experiences. There is insufficient data to test whether this effect is limited to training method or exists across all the cues assessed.

These results suggest that: (a) Individual preferences may be guided by nonobvious interactions such that facets of the training process may not individually affect ratings but instead combine with other facets to have large effects on ratings when considered together; (b) practitioners assessing training needs at the individual level should not evaluate main effects alone: there are likely important influences on what an individual believes to be useful that are not measured by current needs assessment practices or training rating analyses; (c) how much a person integrates training information varies based on motivation to learn and how much prior training they have had; (d) thus, attention should be paid not only to how trainees evaluate information but individual characteristics that influence those evaluations.

Limitations and Strengths

The policy-capturing approach used here provides rich data at the cost of high experimental control. A number of tactics were used to first prevent participants from becoming distracted or inattentive and second to remove participants who had become distracted or inattentive. To prevent loss of attention, as much information as possible was explained and controlled in the directions, lessening the amount of new information in each scenario (Karren & Barringer, 2002). Scenarios were structured with bullet points representing each cue rather than as a single paragraph containing all cues. Additionally, key terms within each bullet point were bolded to make identifying each cue easier.

To screen for inattentive participants, a bogus scenario was included in the experimental scenarios that instructed participants to not rate that scenario (Huang et al., 2011). Participants who rated that scenario normally were removed from the sample. Three duplicate scenarios were also included among the experimental scenarios to check for rater consistency (Hammond et al., 1975). In addition, fatigue effects were assessed by comparing the rating variability between the first half of scenarios and the second half of scenarios (Judge & Bretz, 1992). The good average internal consistency found between duplicate scenarios as compared to the overall consistency, combined with a lack of fatigue effects, indicated that participants who passed the attention check also rated scenarios with stable policies and paid attention throughout the experiment.

The generalizability of the scenario cues is also a concern. The external validity of the cues is connected to how familiar the participants were with the concepts represented by the cues and how well the cues were developed. The cues chosen, i.e., tenure, content, method, and groups, were chosen based on common, arguably integral, and variable facets of the training process described in the literature. Nevertheless, these cues were chosen to the exclusion of any other possible training facet, which limits the scope of the training experience participants rated. The quality of the instructor, for example, is a large part of the training experience, but it could not be easily manipulated in this study. Cue language was developed from accepted definitions of training components described in the literature and pilot tested. Pilot testers were able to distinguish between cues with ease and accurately label each cue. The cues were definitions of terms, and these terms were introduced in the instructions, which would give any participant the ability to at least speculate on their preferences for the cues.

Future research should consider accumulating criteria for important training factors via qualitative interviews. The factors used in this study were largely based on common themes in the training literature; however, the TNA literature is mute with respect to which facets of the training process matter the most to trainees. Qualitative analyses based off of, for example, interviews, focus groups, or free responses to surveys from key stakeholders in the training process, such as training directors, experienced trainees, or training researchers, would provide an excellent source of insight into the training process. Researchers in this area struggling with the lack of pre-existing research may find this technique useful for providing justification for future factors included in a policy-capturing design of this nature.

The sample was intentionally constrained to only those who reported having some experience with training already to reduce the concern of the preceding issue and thereby increase the external validity of the ratings. Given that participants were asked to speculate on how useful and satisfied they would be with fictional training it was vital that all participants had at least some prior training experience to rely upon when rating the scenarios. To ensure that only experienced participants were included in the study, the first question potential participants answered after consenting to the study was whether or not they had taking organizational training. If they had not, they were not included in the sample.

Nevertheless, the data do not reflect actual intentions to sign up for a course or follow through on attending and could not control for every aspect of the training process. Future research should consider using an organization’s in-house training program as a vehicle for collecting true sign-up intentions. Additional cues or aspects of the training process, such as instructor quality, material quality (see Morgan & Casper, 2000), should also be included in future studies. A natural extension of a study like this might be exploring post training outcomes following a “training preferences assessment”; past research (e.g., Tannenbaum, Mathieu, Salas, & Cannon-Bowers, 1991; Tracey, Hikin, Tannebaum, & Mathieu, 2001) has connected trainee expectations to later training outcomes. The policy-capturing and multilevel modeling approach applied in this study represents a powerful way to not only understand preferences but also connect them to later outcomes.

Conclusion

This study addressed the need for more research on training needs assessments by applying policy capturing and hierarchical linear regression, the first application of these methods to the TNA literature, to explore how experienced trainees perceive competing training elements when rating the utility of possible training scenarios. The results support the notion that trainees have stable, measurable preferences about the training experiences they believe to be useful. Scenario ratings varied due to within-subject main effects and interactions, between-subject main effects, and interactions between within-subject and between-subject variables.

Specifically, this study showed that: (a) the methods used here are powerful, fruitful techniques to explore questions and collect data in the TNA literature; (b) potential trainees attend to training methods when rating scenarios; (c) classroom training appears to be the general favorite; (d) but past experience with blended training produced the largest boost to current scenario ratings; (e) and individuals with past experience in classroom and computer-based training experience preferred blended training; (f) age had no effect on ratings; (g) participants valued specific combinations of tenure, group learning, technical training, and blended methods; (h) but the number and types of combinations participants preferred varied with motivation to learn and the amount of prior training experience participants had.

Beyond these general takeaways, there are some important practical and empirical implications to consider. The broad results of this study – that trainees have stable, informative preferences about the training process – is perhaps not surprising but certainly novel in the literature. Support for this notion, coupled with the policy capturing design used in this study, paves the way for organizations to assess and model training preferences in a powerful manner. There is no reason to assume that the training factors used in this study are the limit to what can be or should be explored in future needs assessments; rather, an organization could, for example, develop a list of training elements it could plausibly manipulate (time of day, material type, instructor, specific content, etc.), gather preferences from its employees with a policy capturing survey, and inform their decisions on training design based on those preferences. Via the method used in this study, an organization could evaluate the general training climate, specific preferences, differences between divisions, teams, etc., and tailor training with a range of customizability and specificity limited only by their resources.

This study accumulated evidence for general preferences for enduring aspects of the training process. An organization does not need to run their own study to benefit from this one: There are, as discussed, preferences that hold across age, motivation to learn, and prior training experience that an organization can use immediately to inform future training designs. Future research should explore, beyond the recommendations and lessons learned already discussed, other relationships between preferences and groups, such as industry or job type, that were not explored here. Additionally, findings here continue the discussion on differences between training methods in terms of past experience and current preferences. Future research could explore how experience with blended training has the largest impact on preference ratings, or whether there is a relationship between classroom and blended preferences due to past experience or lack thereof, for example.

This study was one answer to Ferreira and Abbad's (2013) call for more TNA research, but more research is needed. These results support the future exploration of training preferences, specifically how other cues might influence preferences, whether these preferences influence later training evaluations (i.e., to what extent can post-training ratings be explained by preconceptions discussed here versus the actual training?), and whether designing future training to match, even generally, the preferences of trainees improves training learning or transfer outcomes.

The scope of this study was broad but, in its breadth, hopefully provides not only a number of specific recommendations and lessons to be applied to training needs assessment and design but also encouragement by the application of new methods and interesting findings to continue studying TNA.

Table 1

Means, Standard Deviations, Reliabilities, and Correlations of Training Scenario Ratings and Individual Differences

Variable	*M*	*SD*	*ω*	1	2	3	4	5	6	7	8	9	10
Level 1													
1. Utility	3.61	1.05	-	-									
Rating	*N* = 108												
Level 2													
2. Age	36.9	12.2	-	0.05	-								
	N = 91			91									
3. MTL	5.77	0.95	0.91	0.33**	0.20	-							
	N = 108			108	91								
4. RA	2.25	0.90	0.90	-0.12	0.14	0.27**	-						
	N = 108			108	91	108							
5. RC	4.00	1.45	0.76	-0.17	0.17	-0.06	0.28**	-					
	N = 108			108	91	108	108						
6. RO	4.14	1.65	0.89	-0.06	0.12	-0.24*	0.30**	0.48**	-				
	N = 108			108	91	108	108	108					
7. PTE:	3.53	0.93	0.90	0.38**	0.18	0.28*	-0.09	-0.04	0.00	-			
CBT	*N* = 69			69	58	69	69	69	69				
8. PTE:	4.18	0.57	0.82	0.33**	0.01	0.07	-0.29*	-0.15	0.13	0.02	-		
F2F	*N* = 69			69	58	69	69	69	69	54			
9. PTE:	4.23	0.59	0.84	0.62**	0.03	0.28*	-0.18	-0.16	0.07	0.33*	0.37*	-	
Blended	*N* = 63			63	53	63	63	63	63	43	44		
10. PTE:	4.04	0.20	0.95	0.40	0.01	-0.31	0.34	0.29	0.27	0.55	0.26	0.19	-
Mobile	*N* = 9			9	9	9	9	9	9	9	9	6	

Note: MTL = Motivation to learn; RA = Role ambiguity; RC = Role conflict, RO = Role overload, PTE = Prior training experience; CBT = Computer based training; F2F = Face-to-face training

** $p < .01$

* $p < .05$

Table 2

Level 1 Models of Fit Cues on Training Scenario Ratings

	Training Scenario Ratings		
Variable	Coefficient	*SE*	*t*
Intercept, b_0	3.693**	0.085	43.695
Tenure, b_1	0.001	0.042	0.027
Content, b_2	-0.012	0.052	-0.232
Computer, b_3	-0.184**	0.049	-3.750
Classroom, b_4	0.249**	0.066	3.768
Mobile, b_5	-0.305**	0.060	-5.083
Groups, b_6	-0.037	0.056	-0.666
Effect size (%)			42.0%

Reference groups: Tenured, technical content, blended method, group learning

** $p < .01$

* $p < .05$

Table 3

Level 2 Model of Individual Differences on Training Scenario Ratings

	Training Scenario Ratings		
Variable	Coefficient	*SE*	*t*
Intercept, β_0	3.710**	0.76	43.804
Age, β_1	-0.001	0.004	-0.243
MTL, β_2	0.124*	0.051	2.431
PTE: F2F, β_3	0.208*	0.101	2.061
PTE: CBT, β_4	0.142*	0.066	2.142
PTE: Mobile, β_5	0.545	0.646	0.845
PTE Blended, β_6	0.460**	0.095	4.832
RO, β_7	0.028	0.031	0.899
RC, β_8	-0.051	0.034	-1.526
RA, β_9	0.002	0.055	0.046

Note: MTL = Motivation to learn; RA = Role ambiguity; RC = Role conflict, RO = Role overload, PTE = Prior training experience; CBT = Computer based training; F2F = Face-to-face training

** $p < .01$

* $p < .05$

Table 4
Results of Hierarchical Linear Modeling Level 2 Analysis for Measures of Individual Differences

	Training Scenario Ratings		
Variable	Coefficient	*SE*	*t*
Tenure, b_1			
Intercept, γ_{10}	0.011	0.056	0.198
Age, γ_{11}	-0.001	0.005	-0.150
MTL, γ_{12}	0.020	0.049	0.405
PTE: F2F, γ_{13}	-0.176	0.123	-1.430
PTE: CBT, γ_{14}	-0.045	0.059	-0.771
PTE: Mobile, γ_{15}	-0.358	0.264	-1.356
PTE Blended, γ_{16}	0.128	0.121	1.058
RO, γ_{17}	0.047	0.030	1.536
RC, γ_{18}	-0.027	0.033	-0.821
RA, γ_{19}	0.048	0.045	1.075
Effect Size (%)			
Content, b_2			
Intercept, γ_{20}	0.035	0.114	0.308
Age, γ_{21}	-0.003	0.006	-0.522
MTL, γ_{22}	0.077	0.058	1.341
PTE: F2F, γ_{23}	0.110	0.116	0.948
PTE: CBT, γ_{24}	-0.008	0.086	-0.091
PTE: Mobile, γ_{25}	-0.962**	0.367	-2.620
PTE Blended, γ_{26}	-0.138	0.113	-1.215
RO, γ_{27}	0.059	0.051	1.161
RC, γ_{28}	-0.044	0.056	-0.783
RA, γ_{29}	-0.060	0.071	-0.847
Effect Size (%)			
Computer, b_3			
Intercept, γ_{30}	-0.139	0.107	-1.299
Age, γ_{31}	0.001	0.005	0.271
MTL, γ_{32}	-0.054	0.068	-0.798
PTE: F2F, γ_{33}	-0.171	0.121	-1.420
PTE: CBT, γ_{34}	0.082	0.081	1.016
PTE: Mobile, γ_{35}	-1.063**	0.263	-4.045
PTE Blended, γ_{36}	0.045	0.105	0.430
RO, γ_{37}	0.008	0.036	0.219
RC, γ_{38}	0.029	0.044	0.662
RA, γ_{39}	0.004	0.062	0.072
Effect Size (%)			

Note: MTL = Motivation to learn; RA = Role ambiguity; RC = Role conflict, RO = Role overload, PTE = Prior training experience; CBT = Computer based training; F2F = Face-to-face training
** $p < .01$
* $p < .05$

Table 4 Continued

Results of Hierarchical Linear Modeling Level 2 Analysis for Measures of Individual Differences

	Training Scenario Ratings		
Variable	Coefficient	*SE*	*t*
Classroom, b_4			
Intercept, γ_{40}	0.256**	0.074	3.456
Age, γ_{41}	0.005	0.006	0.909
MTL, γ_{42}	0.048	0.112	0.430
PTE: F2F, γ_{43}	0.024	0.114	0.213
PTE: CBT, γ_{44}	-0.316**	0.118	-2.684
PTE: Mobile, γ_{45}	-0.317	0.421	-0.754
PTE Blended, γ_{46}	-0.272	0.154	-1.769
RO, γ_{47}	-0.007	0.053	-0.141
RC, γ_{48}	0.023	0.055	0.412
RA, γ_{49}	-0.030	0.062	-0.489
Effect Size (%)			
Mobile, b_5			
Intercept, γ_{50}	-0.258*	0.109	-2.354
Age, γ_{51}	-0.008	0.008	-1.007
MTL, γ_{52}	-0.026	0.068	-0.382
PTE: F2F, γ_{53}	-0.128	0.152	-0.843
PTE: CBT, γ_{54}	0.121	0.080	1.505
PTE: Mobile, γ_{55}	-1.035**	0.284	-3.642
PTE Blended, γ_{56}	0.039	0.141	0.274
RO, γ_{57}	0.016	0.042	0.383
RC, γ_{58}	0.040	0.055	0.728
RA, γ_{59}	-0.013	0.080	-0.159
Effect Size (%)			
Groups, b_6			
Intercept, γ_{60}	-0.028	0.071	-0.388
Age, γ_{61}	0.001	0.007	0.105
MTL, γ_{62}	-0.019	0.076	-0.254
PTE: F2F, γ_{63}	-0.262	0.190	-1.381
PTE: CBT, γ_{64}	0.002	0.065	0.036
PTE: Mobile, γ_{65}	-0.342	0.290	-1.182
PTE Blended, γ_{66}	-0.101	0.127	-0.797
RO, γ_{67}	-0.028	0.042	-0.652
RC, γ_{68}	0.036	0.034	1.034
RA, γ_{69}	-0.020	0.076	-0.259
Effect Size (%)			

Note: MTL = Motivation to learn; RA = Role ambiguity; RC = Role conflict, RO = Role overload, PTE = Prior training experience; CBT = Computer based training; F2F = Face-to-face training

** $p < .01$

* $p < .05$

Table 5

Results of Generalized Least Squares Analysis for Interactive Configural Cue Processing

	Training Scenario Ratings		
Variable	Coefficient	*SE*	*t*
Intercept	3.650**	0.092	39.703
Tenure x Content	-0.206*	0.095	-2.163
Tenure x Groups	-0.314*	0.138	-2.269
Tenure x CBT	-0.101	0.117	-0.859
Tenure x F2F	-0.089	0.130	-0.683
Tenure x Mobile	0.069	0.115	0.598
Content x Groups	0.007	0.133	0.054
Content x CBT	-0.008	0.137	-0.061
Content x F2F	0.242	0.132	1.831
Content x Mobile	0.199	0.146	1.365
Groups x CBT	-0.067	0.127	-0.525
Groups x F2F	-0.113	0.141	-0.802
Groups x Mobile	0.208	0.148	1.401
Tenure x Content x Groups	0.308	0.184	1.669
Tenure x Content x CBT	0.104	0.152	0.683
Tenure x Content x F2F	0.274	0.166	1.652
Tenure x Content x Mobile	0.014	0.152	0.093
Tenure x Groups x CBT	0.326*	0.168	1.944
Tenure x Groups x F2F	0.342	0.187	1.828
Tenure x Groups x Mobile	-0.001	0.170	-0.006
Content x Groups x CBT	-0.146	0.193	-0.754
Content x Groups x F2F	-0.023	0.168	-0.135
Content x Groups x Mobile	-0.350	0.191	-1.833
Tenure x Content x Groups x CBT	-0.465*	0.229	-2.028
Tenure x Content x Groups x F2F	-0.452*	0.220	-2.054
Tenure x Content x Groups x Mobile	-0.177	0.222	-0.798

Note: CBT = Computer based training; F2F = Face-to-face training

Reference groups: Tenured, technical content, blended method, group learning

** $p < .01$

*$p<.05$

Table 6 (Part 1 of 2)

Results of Generalized Least Squares Analysis for Interactive Configural Cue Processing by Prior Training Experience

	Highest (Q4) Prior Training Experience			Mid-high (Q3) Prior Training Experience		
Variable	Coefficient	*SE*	*t*	Coefficient	*SE*	*t*
Intercept	3.757**	0.192	19.532	3.779**	0.183	20.641
Tenure x Content	-0.092	0.157	-0.583	-0.467**	0.183	-2.554
Tenure x Groups	-0.189	0.284	-0.666	-0.467*	0.227	-2.055
Tenure x CBT	-0.124	0.255	-0.487	-0.178	0.185	-0.958
Tenure x F2F	0.370	0.300	1.233	-0.149	0.169	-0.886
Tenure x Mobile	0.037	0.217	0.171	-0.192	0.178	-1.075
Content x Groups	0.253	0.261	0.968	0.098	0.173	0.566
Content x CBT	-0.146	0.199	-0.733	-0.120	0.240	-0.500
Content x F2F	0.651*	0.296	2.200	0.068	0.153	0.448
Content x Mobile	0.134	0.238	0.563	-0.221	0.174	-1.266
Groups x CBT	-0.350	0.311	-1.124	-0.120	0.177	-0.677
Groups x F2F	0.274	0.355	0.772	-0.134	0.197	-0.682
Groups x Mobile	0.156	0.350	0.445	-0.279	0.192	-1.455
Tenure x Content x Groups	0.242	0.321	0.754	0.279	0.293	0.952
Tenure x Content x CBT	0.037	0.336	0.111	0.381	0.250	1.520
Tenure x Content x F2F	-0.393	0.368	-1.068	0.497*	0.216	2.304
Tenure x Content x Mobile	0.048	0.353	0.135	0.438	0.269	1.624
Tenure x Groups x CBT	0.350	0.362	0.967	0.453	0.252	1.796
Tenure x Groups x F2F	0.071	0.389	0.182	0.425	0.277	1.535
Tenure x Groups x Mobile	-0.059	0.375	-0.157	0.365	0.338	1.078
Content x Groups x CBT	-0.070	0.372	-0.187	0.106	0.328	0.323
Content x Groups x F2F	-0.598	0.427	-1.401	0.048	0.219	0.217
Content x Groups x Mobile	-0.350	0.398	-0.879	0.075	0.228	0.329
Tenure x Content x Groups x CBT	-0.532	0.456	-1.165	-0.643	0.385	-1.670
Tenure x Content x Groups x F2F	0.189	0.430	0.440	-0.395	0.316	-1.252

Tenure x Content x Groups x Mobile	-0.143	0.471	-0.304	-0.408	0.384	-1.061

Note: CBT = Computer based training; F2F = Face-to-face training
Reference groups: Tenured, technical content, blended method, group learning
** $p < .01$
* $p < .05$

Table 6 (Part 2 of 2)

Results of Generalized Least Squares Analysis for Interactive Configural Cue Processing by Prior Training Experience

	Mid-low (Q2) Prior Training Experience			Lowest (Q1) Prior Training Experience		
Variable	Coefficient	*SE*	*t*	Coefficient	*SE*	*t*
Intercept	3.506**	0.167	21.008	3.581**	0.179	20.011
Tenure x Content	-0.244	0.178	-1.370	-0.048	0.232	-0.205
Tenure x Groups	-0.744**	0.287	-2.596	0.158	0.248	0.637
Tenure x CBT	-0.232	0.210	-1.105	0.158	0.253	0.625
Tenure x F2F	-0.376	0.237	-1.591	-0.252	0.250	-1.006
Tenure x Mobile	0.053	0.266	0.198	0.376	0.221	1.696
Content x Groups	-0.066	0.353	-0.188	-0.265	0.187	-1.423
Content x CBT	0.446	0.387	1.152	-0.214	0.195	-1.096
Content x F2F	0.183	0.292	0.627	-0.008	0.219	-0.039
Content x Mobile	0.756	0.432	1.749	0.068	0.163	0.417
Groups x CBT	0.053	0.256	0.207	0.209	0.188	1.115
Groups x F2F	-0.448	0.277	-1.614	-0.175	0.181	-0.967
Groups x Mobile	0.350	0.319	1.098	0.568**	0.213	2.672
Tenure x Content x Groups	1.019*	0.446	2.283	-0.376	0.318	-1.181
Tenure x Content x CBT	0.244	0.268	0.910	-0.235	0.310	-0.757
Tenure x Content x F2F	0.519	0.323	1.606	0.585	0.308	1.901
Tenure x Content x Mobile	0.102	0.257	0.397	-0.517	0.271	-1.909
Tenure x Groups x CBT	0.589	0.330	1.785	-0.119	0.334	-0.355
Tenure x Groups x F2F	0.626	0.437	1.434	0.264	0.315	0.839
Tenure x Groups x Mobile	0.436	0.269	1.618	-0.747**	0.305	-2.450
Content x Groups x CBT	-0.445	0.470	-0.947	-0.158	0.322	-0.492
Content x Groups x F2F	0.294	0.329	0.892	0.238	0.205	1.165
Content x Groups x Mobile	-0.529	0.508	-1.041	-0.555*	0.238	-2.336
Tenure x Content x Groups x CBT	-0.972*	0.464	-2.094	0.338	0.457	0.741
Tenure x Content x Groups x F2F	-1.282**	0.513	-2.497	-0.353	0.376	-0.939

Tenure x Content x Groups x Mobile	-1.151**	0.385	-2.992	1.055**	0.385	2.738

Note: CBT = Computer based training; F2F = Face-to-face training
Reference groups: Tenured, technical content, blended method, group learning
** $p < .01$
* $p < .05$

Table 7 (Part 1 of 2)

Results of Generalized Least Squares Analysis for Interactive Configural Cue Processing by Motivation to Learn

	Highest (Q4) Motivation to Learn			Mid-high (Q3) Motivation to Learn		
Variable	Coefficient	*SE*	*t*	Coefficient	*SE*	*t*
Intercept	3.849**	0.199	19.313	3.656**	0.142	25.661
Tenure x Content	-0.006	0.179	-0.033	-0.354**	0.105	-3.377
Tenure x Groups	-0.256	0.246	-1.038	-0.505**	0.205	-2.467
Tenure x CBT	-0.068	0.175	-0.386	-0.425*	0.178	-2.388
Tenure x F2F	-0.121	0.205	-0.587	-0.202	0.234	-0.863
Tenure x Mobile	-0.068	0.205	-0.333	0.081	0.212	0.381
Content x Groups	-0.006	0.262	-0.021	-0.081	0.163	-0.496
Content x CBT	-0.110	0.182	-0.604	-0.102	0.321	-0.316
Content x F2F	-0.005	0.178	-0.030	0.445	0.268	1.661
Content x Mobile	0.254	0.212	1.199	0.111	0.294	0.379
Groups x CBT	-0.099	0.202	-0.489	-0.273	0.216	-1.267
Groups x F2F	-0.234	0.195	-1.205	-0.181	0.319	-0.569
Groups x Mobile	0.223	0.226	0.985	0.101	0.236	0.428
Tenure x Content x Groups	-0.004	0.325	-0.013	0.676*	0.326	2.073
Tenure x Content x CBT	-0.057	0.235	-0.243	0.485	0.254	1.909
Tenure x Content x F2F	0.203	0.257	0.791	0.364	0.338	1.077
Tenure x Content x Mobile	-0.171	0.263	-0.651	0.182	0.218	0.832
Tenure x Groups x CBT	0.078	0.290	0.270	0.677**	0.247	2.742
Tenure x Groups x F2F	0.329	0.312	1.053	0.515	0.372	1.384
Tenure x Groups x Mobile	-0.108	0.353	-0.307	-0.071	0.254	-0.282
Content x Groups x CBT	-0.109	0.301	-0.361	0.253	0.374	0.676
Content x Groups x F2F	0.193	0.245	0.786	0.069	0.333	0.209
Content x Groups x Mobile	-0.547	0.361	-1.515	-0.021	0.299	-0.070
Tenure x Content x Groups x CBT	-0.131	0.419	-0.313	-0.990**	0.322	-3.075
Tenure x Content x Groups x F2F	-0.360	0.413	-0.870	-0.767	0.412	-1.861

Tenure x Content x Groups x Mobile	0.317	0.427	0.744	-0.382	0.350	-1.092

Note: CBT = Computer based training; F2F = Face-to-face training
Reference groups: Tenured, technical content, blended method, group learning
** $p < .01$
* $p < .05$

Table 7 (Part 2 of 2)

Results of Generalized Least Squares Analysis for Interactive Configural Cue Processing by Motivation to Learn

	Mid-low (Q2) Motivation to Learn			Lowest (Q1) Motivation to Learn		
Variable	Coefficient	*SE*	*t*	Coefficient	*SE*	*t*
Intercept	3.847**	0.139	27.773	3.164**	0.208	15.207
Tenure x Content	0.044	0.172	0.257	-0.502	0.306	-1.643
Tenure x Groups	-0.350	0.293	-1.195	-0.027	0.402	-0.068
Tenure x CBT	0.332*	0.171	1.938	-0.058	0.407	-0.141
Tenure x F2F	0.059	0.204	0.287	0.020	0.409	0.050
Tenure x Mobile	0.135	0.253	0.535	0.227	0.262	0.867
Content x Groups	0.165	0.355	0.466	0.036	0.324	0.112
Content x CBT	0.574*	0.262	2.195	-0.280	0.261	-1.070
Content x F2F	0.605	0.334	1.808	-0.044	0.266	-0.165
Content x Mobile	0.514	0.347	1.481	-0.042	0.321	-0.132
Groups x CBT	0.196	0.220	0.890	0.068	0.400	0.170
Groups x F2F	0.119	0.228	0.521	-0.028	0.357	-0.077
Groups x Mobile	0.334	0.346	0.965	0.258	0.441	0.585
Tenure x Content x Groups	0.289	0.414	0.697	0.185	0.429	0.432
Tenure x Content x CBT	-0.605*	0.303	-1.993	0.453	0.420	1.080
Tenure x Content x F2F	0.092	0.363	0.254	0.391	0.379	1.032
Tenure x Content x Mobile	-0.045	0.354	-0.126	0.058	0.439	0.132
Tenure x Groups x CBT	0.305	0.353	0.866	0.138	0.499	0.277
Tenure x Groups x F2F	0.442	0.363	1.216	-0.051	0.451	-0.114
Tenure x Groups x Mobile	0.530	0.358	1.481	-0.321	0.400	-0.803
Content x Groups x CBT	-0.755	0.413	-1.829	-0.228	0.467	-0.487
Content x Groups x F2F	-0.377	0.378	-0.998	-0.162	0.408	-0.397
Content x Groups x Mobile	-0.575	0.487	-1.182	-0.369	0.413	-0.894
Tenure x Content x Groups x CBT	-0.200	0.471	-0.425	-0.391	0.673	-0.580
Tenure x Content x Groups x F2F	-0.591	0.403	-1.469	0.084	0.517	0.163

Tenure x Content x Groups x Mobile	-0.742	0.571	-1.300	0.020	0.429	0.047

Note: CBT = Computer based training; F2F = Face-to-face training
Reference groups: Tenured, technical content, blended method, group learning
** *p* < .01
* *p* < .05

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APPENDICES

Appendix A

Training Method Scenarios (Uncombined)

Instructions:

Imagine you are in an organization that routinely offers training through a variety of training methods. In some of the following scenarios, you will be asked to imagine that you either just joined the organization or you have been a part of the organization for a while. You have the ability to choose from a variety of week-long training programs that train either human skills (e.g, communication skills) or technical skills (e.g., using computer software), and you can take these training programs by yourself or with your team (please assume that your team would be equally willing to take the training as you are). Please read the following training scenarios carefully and decide which ones appeal the most to you. Pretend you are actually deciding which training you would like to take the most when making your ratings. Thank you very much in advance for your attention.

Tenure:

- You are a **new hire** within an organization.
- You have **worked for a number of years** within the same organization.

Content:

- This training course offers training in **human skills**, such as networking, communication, or motivating others.
- This training course offers training in **technical skills**, such as using computer software, writing, or analyzing data.

Training method:

- The training material will be **taught by an instructor in a classroom**. The instructor explains all of the training material to you and you are welcome to ask questions and interact with your fellow trainees.
- The training material will be **available online, accessible via your computer**. You are responsible for mastering the material yourself, but you can complete the training at your own pace and whenever or wherever it is convenient for you to do so.
- The training material will be **available to you from your smartphone or tablet**. You are responsible for mastering the material yourself, but the training app may prompt you to interact with it at times or places important to the training content. Otherwise, you can complete the training wherever or whenever you want to.
- The training material will be **available on your computer** but you will **also meet intermittently** in a classroom with an instructor. You will work through most of the training material yourself whenever and wherever it is convenient for you, but an instructor will answer questions and explain any complex material to you and your fellow trainees during a set meeting time.

Group:

- You will participate in this training as **part of a group** responsible for mastering the material together (e.g., with your team members or colleagues that you work with closely).
- You will be responsible for learning and **mastering the material yourself**, although other individuals may be enrolled in the same course.

Training Method Scenarios (Combined - Example)

- You are a **new hire** within an organization.
- This training course that offers training in **human skills**, such as networking, communication, or motivating others.
- The training material will be **taught by an instructor in a classroom**. The instructor explains all of the training material to you and you are welcome to ask questions and interact with your fellow trainees.
- You will participate in this training as **part of a group** response for mastering the material together (e.g. with your team members or colleagues that you work with closely).

Appendix B

Demographics

How old are you? (enter a number)

Please indicate your gender:

- Male
- Female
- Other
- Prefer not to say

What ethnicity do you most identify with?

- White
- Hispanic or Latino
- Black or African American
- Native American or American Indian
- Asian or Pacific Islander
- Multiracial
- Other

On average, how many hours do you work a week?

- (Must put in a number between 0 – 168)

During a busy week, how many hours do you work on average

- (Must put in a number between 0 – 168)

How many years have you been with your current employer?

Years:__ Months:__

How many years have you been in your current job?

Years:__ Months:__

How many years of education do you have?

- Did not complete high school
- High school degree/GED
- Bachelor's degree
- Master's or professional degree (e.g., MA, MBA, JD)
- Other degree beyond a master’s or professional degree (e.g., Ph.D. or MD)

What is your current occupation?

- o Managerial or professional specialty
- o Executive, administrative, or managerial
- o Professional specialty
- o Technical, sales, or administrative support
- o Technicians or related support
- o Sales
- o Administrative support or incl. clerical
- o Service
- o Private household
- o Protective service
- o Service, exc. protective or household
- o Farming, forestry, or fishing
- o Precision production, craft, or repair
- o Operations, fabrication or labor
- o Machine operation, assembly, or inspection
- o Transportation or material moving
- o Handling or cleaning equipment, help or labor

Approximately how many people does your organization employ?

What industry is your organization in?

What state in your organization in?

Appendix C.

Training Reactions

1 – 5 strongly disagree to strongly agree

1. The training would be useful for my specific job.
2. The training would be useful for my personal development.
3. The training would merit a good overall rating.

Appendix D.

Prior Training Experience

1. Please estimate how many training courses have you taken in your career (enter a number).
2. Please estimate how many training courses you have taken in the past year (enter a number).

Appendix E.

Role Stress

1 - 7 Strongly disagree to strongly agree

Role overload
1. I never seem to have enough time to get everything done at work.
2. The amount of work I am expected to do is too great.
3. It often seems like I have too much work for one person to do.

Role conflict
4. I receive conflicting instructions from two or more people.
5. My subordinates make conflicting demands on me.
6. I do things which are accepted by one person, but not by another.
7. Upper-management makes conflicting demands on me.

Role ambiguity
8. I know what my supervisor considers satisfactory work performance.
9. I am certain how to go about getting my job done (the methods to use).
10. It is clear to me what is considered acceptable performance by my supervisor.
11. I know what is the best way (approach) to go about getting my work done.
12. I know what level of performance is considered acceptable by my supervisor.
13. I know how to get my work done (what procedures to use).
14. I know when I should be doing a particular aspect (part) of my job.
15. I am certain about the sequencing of my work activities (when to do what).
16. My job is such that I know when I should be doing a given work activity.

Appendix F.

Motivation to Learn

1 - 5 Strongly disagree to strongly agree

1. In general, I exert considerable effort to learning the materials during training.
2. In general, I try to learn as much as I can from training.
3. In general, I am motivated to learn the skills emphasized in training.

Appendix G.

Insufficient Effort Responding Items

Role Stress

17. You should rate this statement a two and a five.

Training Scenario

- You are a **new hire** within an organization.
- This **training course** is fictitious. This scenario is checking to see whether you're paying attention.
- If you are, ignore the rest of **this scenario** and do not rate this scenario.
- You will be responsible for learning **mastering the material yourself**, although other individuals may be enrolled in the same course.