

REACTIONS TO SKILL ASSESSMENT:  
THE FORGOTTEN FACTOR IN EXPLAINING MOTIVATION TO LEARN

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### Abstract

This study examined the effects of trainees' reactions to skill assessment on their motivation to learn. A model was developed that suggests that two dimensions of trainees' assessment reactions – distributive justice and utility – influence training motivation and overall training effectiveness. The model was tested using a sample of individuals ( $N = 113$ ) enrolled in a truck driving training program. Results revealed that trainees' who perceived higher levels of distributive justice and utility had higher motivation to learn. Training motivation was found to significantly predict several measures of training effectiveness. Trainees' performance on the pre-training assessment and trait goal orientation exhibited direct and interactive effects on their reactions to the skill assessment. Implications of these findings for future research on reactions to skill assessments are identified along with the practical implications for the design and conduct of training needs assessment.

In recent years, a number of significant demographic, technological, socio-cultural, and economic forces have combined to create a work environment characterized by rapid change and increasing complexity (Goldstein & Gilliam, 1990; Howard, 1995; Thayer, 1997). As the changing nature of work requires employees to continually develop and change, many organizations have recognized the potential for workplace learning and continuous improvement to serve as a source of sustained competitive advantage (Hall & Mirvis, 1995; Salas & Cannon-Bowers, 2001). Indeed, recent research suggests that organizational training is one of the most pervasive and potentially potent methods of enhancing individual productivity and organizational effectiveness (Arthur, Bennett, Edens, & Bell, 2003).

It is well acknowledged that one of the keys to developing a systematic approach to training that can lead to improved productivity and effectiveness is a thorough assessment of needs (Goldstein, 1986; McGehee & Thayer, 1961). It is not surprising then that the growing emphasis on employee development as a strategic organizational priority has been accompanied by greater interest in assessing employees' development needs (Herriot & Anderson, 1997). For example, American College Testing (ACT) has identified basic foundational and advanced skill competencies for the workplace and has developed an extensive testing and assessment process called WorkKeys that measures an individual's level of competency (McLarty & Vansickle, 1997). Training and developmental opportunities are then provided to individuals to address key skill gaps (e.g., see Nash & Korte, 1997). A similar model has been followed by many Corporate Universities. Meister (1994), for example, highlighted a skill inventory program at IBM that identified employee skill gaps relevant to the functional skill requirements of the company. To close this gap, an employee Individual Education Plan is developed to provide

each employee with a road map of instructional modules, training courses, and individual learning activities.

Skill assessments and the development of skill inventories make sense from an organizational perspective to link developmental learning activities to the organization's strategic plan. Yet, as noted by Ryan, Brutus, Greguras and Hakel (2000), the effectiveness of these assessments rest in part on the assumption that individuals want to be assessed and that they are motivated to gain insight into their skill gaps. Farr (1993) contends that organizations should be concerned about how individual's perceive the feedback from skill assessment as these perceptions can impact what insights are gained from the assessments. However, little is known about individuals' responses to skill assessment feedback and how those responses impact subsequent motivation to address the identified skill gaps through organizationally sponsored training programs (Noe, Wilk, Mullen, & Wanek, 1997).

Consequently, it is important to ask not only how we can assess trainee skills in order to determine appropriate training placement but also what impact the assessment process can have on a trainees' motivation to learn (Goldstein & Ford, 2002). For example, Noe's (1986) model of training motivation posited that motivation to learn would be impacted by trainees' reactions to skill assessments and feedback on those assessments given prior to training. Yet, very few empirical studies have been conducted on person analysis or the implications of individuals' reactions to skills assessments (Colquitt, LePine, & Noe, 2000). As Salas and Cannon-Bowers (2001, p. 477) note, "... whereas most training researchers believe and espouse that training-needs analysis is the most important phase in training, this phase remains largely an art rather than a science."

The purpose of the current study, therefore, is to develop and test a model of reactions to assessment and their implications for training motivation. There are several expected contributions of this effort. First, this study begins to address the current gap in research on training needs assessment and offers insight into the process by which trainees' reactions to the needs assessment process influence training effectiveness (Salas & Cannon-Bowers, 2001). Second, the current study examines two distinct types of assessment reactions, utility perceptions and justice perceptions. While earlier work by Quiñones (1995, 1997) suggests that justice perceptions may serve as an important predictor of trainees' motivation to learn, very little subsequent research has incorporated justice constructs into theories of training effectiveness. The current study extends Quiñones' work by advancing our understanding of how different facets of assessment reactions influence motivation to learn. Finally, Colquitt et al. (2000) note the need for research that considers a broader array of personality variables in models of motivation to learn. In the current study, we examine trainees' trait goal orientation as one facet of personality that may influence how trainees react to pre-training skill assessments. The specific relationships examined in this study are presented in Figure 1 and discussed in the following sections.

## Literature Review and Theoretical Framework

### *Training Effectiveness*

Noe (1986) presented one of the first comprehensive models of the motivational influences on training effectiveness. In the model, he highlighted the important role of trainability in understanding training effectiveness. In particular, he noted that trainability is a function of three factors – ability, motivation, and perceptions of the work environment. As he

notes, even if trainees possess the ability needed to learn the program content, training outcomes will be poor if motivation is low.

The Noe model contended that motivation to learn and environmental favorability are critical factors affecting learning and behavioral change as a function of training. Motivation to learn is impacted by individual differences (e.g., locus of control, perceived self efficacy), career and job attitudes (e.g., job involvement), and reactions to skill assessments and feedback on those assessments given prior to training. The Noe model has stimulated a large number of studies on motivation to learn and training outcomes and the field has progressed to where a meta-analytic study could be completed 15 years later on 106 empirical studies (Colquitt et al., 2000). The meta-analysis yielded two major findings. First, it showed that a number of individual characteristics, such as locus of control and anxiety, predict training motivation and learning outcomes. However, the authors also noted that very few personality variables have been examined with great frequency and recommended that future research consider expanding the scope of personality variables to include individual differences such as trait goal orientation and affectivity. Second, the meta-analytic results provided strong evidence that pre-training motivation has a significant impact on a variety of training outcomes (e.g., reactions, self-efficacy, skill acquisition) over and above the effects of cognitive ability.

#### *Reactions to Skill Assessment*

Noe (1986) contends that the positive or negative reactions to the information individuals receive from an assessment regarding their strengths and weaknesses are likely determinants of their motivation to learn or develop skills in a particular training program. Noe identified a number of possible dimensions relevant to skill assessment reactions including trainee beliefs concerning the accuracy of the needs assessment information, overall satisfaction with the person

analysis method used, and the extent to which the information results in improvement in the trainee's understanding of their skill strengths and limitations (i.e., utility perceptions). Noe (1986, p. 743) notes that "...if trainees perceive the needs assessment as credible and as providing useful information regarding skill strengths and weaknesses, they will react favorably to the information received. As a result, trainees likely will be motivated to improve skill weaknesses through participation in a training program specifically designed on the basis of the needs assessment information."

Using a sample of high school administrators attending a training program on leadership, Noe and Schmitt (1986) examined the consequences of trainees' reactions to skill assessment. They found an effect of reactions to skill assessment on trainees' overall reactions (e.g., how much a trainee liked the program) to the training program they attended. That is, people who were more favorable towards the pre-training skill assessment process were more likely to react favorably to the training program itself. They also found a positive relationship between reactions to skill assessment and pre-training motivation ( $\beta = .17$ ), although this relationship was not statistically significant. However, Noe and Schmitt (1986, p. 519) suggest that the path coefficients generated for their model are unlikely to remain stable in future research because of the small sample ( $N = 60$  trainees) used in their study. This suggests that additional research is needed on the relationship between assessment reactions and motivation to learn. Unfortunately, Colquitt et al. (2000) noted that they could not meta-analyze the impact of reactions to skill assessments on motivation to learn as there were no other study besides the Noe and Schmitt paper on the topic.

While direct studies on person assessment are lacking, there is research on the framing of training that has relevance to person analysis and skill assessment reactions. For example,

Martocchio (1992) and Quiñones (1995) have conducted research that shows the importance of pre-training organizational contextual effects on trainee attitudes and behaviors. Quiñones (1997) notes that contextual factors represent higher order variables that are perceived by individuals and influence "...their thoughts and actions" (p. 181), which in turn can influence trainee motivation and training outcomes. In particular, he argues that organizational context factors are likely to impact trainee motivation to learn, self efficacy and fairness perceptions.

Quiñones (1995), for example, noted that feedback information regarding past performance can also be viewed as a framing event for trainees. He had individuals work on an assessment instrument, which tapped declarative and procedural knowledge relevant to the training that was to be offered. He then created two types of frames prior to individuals attending training. One frame was that the assessment indicated that the person was ready for an advanced training course while the other frame was that the assessment indicated the individual should be assigned to a remedial course. He noted that future trainees may question the fairness of the assignments when the assignment is inconsistent with their perceptions of past performance and their assignment expectations. The results showed that perceptions of past performance and expected assignment moderated the relationship between actual assignment and fairness perceptions. Further, Quiñones found that trainees with more favorable fairness perceptions had higher levels of motivation to learn.

In the current study, we examine the effects of two types of reactions - justice perceptions and utility perceptions - on trainees' motivation to learn. The important of justice perceptions for motivation is highlighted by research on equity theory (Adams, 1965). As noted by Goodman (1977), perceptions of equity are affected by whether individuals see that their level of inputs (effort, knowledge) as consistent with their level of outputs (e.g., outcomes such as rewards).

Utility perceptions are forward looking and expectancy based (i.e., to what extent do I think that my efforts will lead to a certain performance level and thus to valued outcomes) (Lawler, 1973). These two dimensions are not only theoretically relevant but are also consistent with Noe's (1986) multi-dimensional conceptualization of reactions (e.g., credibility, utility). These concepts are also supported by recent work in the performance appraisal field showing that fairness and perceived utility represent distinct dimensions of ratees' reactions (Keeping & Levy, 2000).

*Distributive justice perceptions.* One set of relationships examined in this study concern the effects of trainees' pre-training perceptions of distributive justice on subsequent motivation to learn. Recent research by Colquitt (2001) has revealed four dimensions of organizational justice: (a) the fairness of outcome distributions, distributive justice; (b) the fairness of procedures used to determine outcome distributions, procedural justice; (c) the quality of interpersonal treatment received when procedures are implemented, interpersonal justice; and (d) the adequacy of information conveyed about why procedures were used a certain way or how outcomes were determined, informational justice. Prior research suggests that the effect of these different dimensions of justice in a specific situation depends on the referent of the outcome under investigation. In particular, distributive justice appears to have a greater influence on person-referenced outcomes (e.g., satisfaction), while procedural justice and interactional justice (i.e., interpersonal, informational) exert a greater influence on system-referenced outcomes (e.g., organizational commitment) and agent-referenced outcomes (e.g., supervisory trust), respectively (Cohen-Charash & Spector, 2001; Colquitt, Conlon, Wesson, Porter, & Ng, 2001; Folger & Konovsky, 1989; Lind & Tyler, 1988; Sweeney & McFarlin, 1993). Because motivation to learn represents a person's attitudes toward training, it falls within the category of person-referenced

outcomes and, therefore, should relate most strongly to trainees' perceptions of distributive justice. Accordingly, in the current study we focus on the dimension of distributive justice.

Distributive justice exists to the extent that individuals see that their outcomes are consistent with implicit norms for allocation (Colquitt, 2001). Although different allocation rules, such as equality or need, may be important depending on the goals of a particular situation, most distributive justice research has focused on the equity rule. Leventhal (1976, p. 94) describes the equity rule as "a single normative rule which dictates that rewards and resources be distributed in accordance with recipients' contributions." When conceptualized according to the equity rule, distributive justice is fostered when individuals perceive their outcomes as appropriate, given their inputs or contributions.

Noe (1986) argued that one facet of assessment reactions that will influence trainees' motivation is the perceived credibility of the assessment feedback. When the needs assessment information is viewed as credible, trainees are more likely to accept the feedback and be motivated to participate in a training program that helps them address their skill weaknesses (Noe, 1986; Noe & Schmitt, 1986). One factor that may underlie the perceived credibility of assessment feedback is distributive justice. When trainees' view the feedback as appropriate and justified given their performance on the assessment (i.e., view the feedback as equitable), they are more likely to perceive the feedback as credible and demonstrate enhanced motivation to learn. Accordingly, we expect a positive relationship between trainees' perceptions of distributive justice and their motivation to learn. Additional support for this hypothesis is provided by the findings of Quiñones (1995) reviewed earlier as well as research that has examined the motivational consequences of justice in other organizational settings. For instance, studies have demonstrated that job applicants' justice perceptions relate positively to

motivational outcomes, such as test-taking motivation and self-efficacy (Hausknecht, Day, & Thomas, 2004; Ryan & Ployhart, 2000).

*Hypothesis 1: Trainees' distributive justice perceptions will be positively related to their motivation to learn.*

*Utility perceptions.* The second reaction dimension we examine in this study is trainees' utility perceptions, or the extent to which trainees' perceive the assessment feedback as useful for identifying their strengths and weaknesses and ultimately improving their skills. Noe and Schmitt (1986) suggested that when trainees perceive the needs assessment as providing useful information regarding skill strengths and weaknesses they will react favorably to the information received and will be more motivated to improve skill weaknesses in training. However, they focused on the effect of overall assessment reactions and did not examine the implications of specific reaction dimensions. Brett and Atwater (2001) conducted a study to examine individuals' reactions to feedback designed for developmental purposes (360° feedback). They proposed that "... individuals who find the feedback more useful will express motivation to change and focus on development ..." (p. 933). Consistent with their arguments, they found that participants' ratings of feedback usefulness were significantly related to the 360° feedback facilitator's ratings of the participants as development-focused. Based on this evidence, we expect a positive relationship between trainees' utility perceptions and their motivation to learn.

*Hypothesis 2: Trainees' utility perceptions will be positively related to their motivation to learn.*

#### *Antecedents of Reactions to Skill Assessment*

In the few previous studies that have examined the effects of pre-training factors on trainees' motivation, experimental manipulations have been used to induce different reactions

from trainees. In the field, however, variability in trainees' reactions may result not only from trainees' experiences during the assessment but also by what they bring with them to the situation. Individual differences serve as a lens through which trainees' interpret and react to their assessment experiences. In the current study, we examine the direct and interactive effects of trainees' assessment performance and trait goal orientation on trainees' assessment reactions. Both of these antecedents are discussed in more detail below.

*Assessment performance.* Prior research utilizing the organizational justice framework has found that the favorability of the outcome one receives has an influence on perceptions of the fairness of the outcome (Brockner & Wisenfeld, 1996; Hausknecht et al., 2004). For example, Bauer, Maertz, Dolen, and Campion (1998) found that job applicants who received feedback that they had passed an employment test had more positive fairness perceptions than those who failed. Similarly, Gilliland (1994) found that individuals who received a positive selection decision perceived higher levels of distributive justice than those who received a negative selection decision. Accordingly, we expect that individuals who perform better on the pre-training assessment will have more positive perceptions of distributive justice.

*Hypothesis 3: Trainees' pre-training assessment performance will be positively related to their perceptions of distributive justice.*

Outcome favorability may also influence individuals' utility perceptions. Ilgen, Fisher, and Taylor (1979) note that an individual's desire to respond to feedback is related to the sign of the feedback. In particular, positive feedback enhances individuals' perceptions of their response capability, which may bolster individuals' perceptions of the usefulness of the feedback (Martocchio & Webster, 1992). Brett and Atwater (2001), for example, found that lower 360° feedback ratings from others (i.e., boss, peers) generated more negative reactions (i.e., angry,

confused, discouraged), which in turn detrimentally impacted the perceived usefulness of the feedback. Based on this evidence, we predict that trainees who perform better on the pre-training assessment will have more positive utility perceptions.

*Hypothesis 4: Trainees' pre-training assessment performance will be positively related to their utility perceptions.*

*Goal orientation as a moderator.* Goal orientation is a construct originating within the educational literature that suggests that individuals' demonstrate goal preferences in achievement situations (Bell & Kozlowski, 2002; Brett & Vandewalle, 1999; Vandewalle, 2003). Recent research has posited three dimensions of goal orientation: a *learning orientation* focused on the development of competence and task mastery, a *performance-prove orientation* focused on the attainment of favorable judgments of competency, and a *performance-avoid orientation* focused on avoiding perceptions of failure and incompetence (Elliot & Church, 1997; Vandewalle, 1997).

These orientations differentially influence how individuals interpret and respond to failure and negative feedback. Individuals with a learning orientation tend to hold an incremental theory about their ability (Dweck, 1986, Dweck & Leggett, 1988). That is, they tend to view ability as a malleable attribute that can be developed. Accordingly, individuals high in learning orientation view negative feedback as useful, diagnostic information and as an opportunity to develop their competence and improve their performance (Vandewalle & Cummings, 1997; Vandewalle, Ganesan, Challagalla, & Brown, 2000). In contrast, individuals with a performance orientation tend to hold an entity theory about their ability, which views ability as a fixed, uncontrollable attribute. As a result, performance oriented individuals interpret negative feedback as an evaluation of their competence and a threat to their ego (see also Farr,

1993; Noe et al., 1997; VandeWalle, 2003; VandeWalle, Cron, & Slocum, 2001). They typically perceive little value in negative feedback and may adopt a self-protective posture in which they devalue or discredit the assessment to protect their ego (Dweck & Leggett, 1988; VandeWalle et al., 2000).

Based on this evidence, we predict that the response patterns associated with these different types of goal orientation will moderate individuals' reactions to assessment feedback. In particular, when individuals perform well during the assessment and receive mostly positive feedback, we anticipate there will be little variation in the reactions of individuals with different levels of goal orientation profiles. However, when individuals perform more poorly during the assessment, we anticipate that goal orientation will moderate individuals' reactions to the negative feedback. Consistent with the arguments reviewed above, we expect that individuals high in learning orientation will perceive negative feedback as an opportunity and therefore react more positively than individuals low in learning orientation. In contrast, individuals high in performance orientation (both prove and avoid) will perceive negative feedback as an ego threat and, therefore, react more negatively than individuals low in performance orientation.<sup>1</sup>

*Hypothesis 5: Learning orientation will moderate the relationship between pre-training assessment performance and assessment reactions (utility and distributive justice) such that trainees high in learning orientation will react more positively to negative feedback than trainees low in learning orientation.*

*Hypothesis 6: Performance orientation (prove and avoid) will moderate the relationship between pre-training assessment performance and assessment reactions (utility and distributive justice) such that trainees high in performance orientation will react more negatively to negative feedback than trainees low in performance orientation.*

### *Training Outcomes*

In an effort to demonstrate the importance of trainees' motivation to learn in the current training context, we examine the relationship between training motivation and several measures of training effectiveness (Kraiger, Ford, and Salas, 1993). In particular, we examine the relationship between training motivation and several proximal training outcomes, including training reactions, post-training self-efficacy, and behavioral intentions. While training reactions and self-efficacy have received considerable attention as outcomes of motivation to learn, behavioral intentions have been less studied. Research has demonstrated that behavioral intentions account for considerable variance in actual behavior (e.g., Ajzen, 1991), and they were identified as an important outcome in the current study given the focus of the training on promoting safe, everyday driving behaviors. These three proximal training outcomes are expected to significantly predict the more distal outcome of post-training assessment performance, after controlling for trainees' pre-training skill level.

*Hypothesis 7: Trainees' motivation to learn will be positively related to their training reactions, post-training self-efficacy, and behavioral intentions.*

*Hypothesis 8: Training reactions, post-training self-efficacy, and behavioral intentions will be positively related to post-training assessment performance, after controlling for pre-training assessment performance.*

### Method

#### *Participants*

The population for this study was 152 individuals enrolled in truck driving training school. The program teaches the knowledge and skills necessary to earn a commercial drivers license (CDL). Prior to completing a pre-training skill assessment, individuals were invited to

participate in the research project. Usable data was collected from 113 individuals (74.3% response rate). The demographic makeup of the participants was: 93.8% male, 6.2% female; 67.3% Caucasian, 22.1% African American, 5.3% Hispanic, .9% Asian, and 4.4% chose not to identify race; and the average age was 36.55. We asked participants whether they had any previous experience driving non-CDL trucks (GVWR 10,000 – 26,000 lbs), to which 70.8% reported no previous experience, 27.4% indicated having previous experience, and 1.8% chose not to report experience. Among participants with previous experience, the average number of years experience was 5.45. Participants who provided usable data did not differ significantly in age, gender, race, or experience from the total trainee population.

### *Procedure*

This study was conducted in conjunction with a training program focused on teaching defensive driving skills. The program was run by a non-profit truck safety organization and was offered as a voluntary opportunity for individuals enrolled in the truck driving training school. The truck driving school, though, did encourage individuals to attend the program. The defensive driving course consisted of two, two-hour classroom sessions separated by approximately one week. The program focuses on actions that truck drivers can take that increase or decrease the probability of an accident occurring while on the road. The sessions emphasize information that has direct application to the safe and skillful operation of a truck. In particular, the program focuses on issues of situational awareness and close calls, how driving tasks and driving behaviors are interrelated, and issues of search, speed, direction control and timing (Vanossdall, Irwin, & Ring, 2000).

Approximately two weeks before the first classroom session and two weeks after the second classroom session, trainees participated in a road course evaluation in which their

defensive driving skills were evaluated by a trained observer. In the road course evaluation, referred to as Driver Performance Measurement (DPM), trainees are tasked with driving a tractor-trailer through a pre-set route, which was the same for both assessments. The route combines city and highway driving and takes approximately 90 minutes to complete. Observers provide navigational directions and record trainees' performance on standardized evaluation forms. There were eight different observers used during this training program, all of whom have received extensive training on how to evaluate drivers' performance based on well defined performance criteria. Following the evaluation, the observer discusses for approximately 30 minutes his evaluation with the trainee, providing feedback on the trainees' strengths and weaknesses in areas such as situational awareness and accident prevention. The pre-training assessment served as a mechanism for highlighting trainees' skill gaps. In addition, individuals' experiences during the assessment were used as discussion topics throughout the training program. The post-training assessment was one of several measures used to evaluate the training program.

In this study, participants were surveyed at six different points in time. This research design introduced a time lag, ranging from several hours to several weeks, between the measurement periods, which Podsakoff, MacKenzie, Lee, and Podsakoff (2003) suggest is an effective technique for controlling for common method variance. In particular, temporal separation of predictor and criterion variables eliminates the saliency of any contextually provided retrieval cues and allows previously recalled information to leave short-term memory. Further, temporal separation reduces consistency motifs and demand characteristics by diminishing respondent's ability and motivation to use prior responses to answer subsequent questions (Podsakoff et al., 2003).

Immediately prior to the pre-training assessment we measured trainees' trait goal orientation. Following the road course evaluation and feedback session, we assessed trainees' distributive justice and utility perceptions. At the beginning of each of the two classroom sessions we assessed trainees' motivation to learn, and at the end of the second classroom session we assessed trainees' reactions and behavioral intentions. Finally, immediately prior to the post-training assessment we measured trainees' post-training self-efficacy.

### *Measures*

*Assessment performance.* The route that trainees drove during the skill assessment contained 17 distinct segments. These segments are of approximately the same length and require trainees to perform specific driving tasks (e.g., shifting lanes, merging, making a turn). During each of these segments, observers evaluated trainees' performance in four areas: search, speed control, direction control, and overall accident reduction. Trainees were rated as either satisfactory (1) or unsatisfactory (0) in each of these areas based on well defined performance criteria (Gustafson, Bradshaw, & Vanosdall, 1981). In the current study, we used the ratings of trainees on the search dimension as our measure of performance. The decision to focus on the search ratings was guided by three factors. First, a review of the training materials revealed that the topics of search and situational awareness were emphasized in the classroom sessions. Hence, motivation to learn (and actual learning) during the training should have the greatest impact on this facet of trainees' driving performance. Second, the greatest variance in trainees' performance was observed on the search dimension, which is likely a product of the fact that the mean ratings on search were consistently lower than the other three performance dimensions. For example, on the pre-training assessment trainees received satisfactory search ratings on only 43% of the segments, whereas they received satisfactory speed ratings on 93% of the segments,

satisfactory direction ratings on 83% of the segments, and satisfactory ratings on overall accident reduction in 84% of the segments. Finally, perhaps because search was the most difficult performance dimension, an examination of feedback notes recorded by observers indicated that this element of trainees' performance was emphasized during the feedback sessions. Thus, we calculated trainees' pre- and post-training assessment performance by averaging observers' ratings of trainees' search behavior on the 17 route segments. Internal consistency reliability was .83 for the pre-training performance measure and .87 for the post-training performance measure.

*Goal orientation.* Participants' goal orientation was assessed using VandeWalle's (1997) trait goal orientation measure. The measure asks individuals to indicate their goal preferences in the work domain, with responses made on a 6-point scale ranging from "strongly disagree" (1) to "strongly agree" (6). The learning orientation scale consisted of 4 items ( $\alpha = .81$ ). A sample item is "I enjoy challenging and difficult tasks at work where I'll learn new skills." The performance-avoid orientation measure consisted of 4 items ( $\alpha = .82$ ). A sample item is "I prefer to avoid situations at work where I might perform poorly." Performance-prove orientation was assessed with 4 items ( $\alpha = .86$ ). A sample items is "I try to figure out what it takes to prove my ability to others at work."

*Distributive justice perceptions.* Trainees' perceptions of distributive justice in the assessment process were assessed using three items from Colquitt's (2001) measure of organizational justice. The items were tailored to fit the assessment context and responses were made on a 5-point scale ranging from "strongly disagree" (1) to "strongly agree" (5). A sample item is "The assessment of my driving behavior was justified given my level of performance on the DPM." Reliability of this scale was .86.

*Utility perceptions.* Perceptions of the utility of the skill assessment were measured using a 6-item scale ( $\alpha = .84$ ) administered after the feedback session. The items asked trainees to evaluate the extent to which the skill assessment was a valuable experience and one that provided feedback that would help them become a better driver. All items were rated on a five-point scale ranging from “strongly disagree” (1) to “strongly agree” (5). A sample item is “The DPM feedback provided me with useful information to help improve my driving.” We conducted a confirmatory factor analysis (CFA) to examine the factor structure of the reactions to assessment measures. The CFA revealed that a two-factor model of distributive justice and utility perceptions not only provided acceptable fit to the data ( $\chi^2(25, N = 113) = 52.08, p < .01$ ;  $\chi^2/df = 2.08$ ; CFI = .94; RMSEA = .099; and SRMR = .073), but also fit significantly better than an alternative one-factor model ( $\Delta\chi^2 = 150.16, df = 2, p < .01$ ). This provides support for the structure of assessment reactions used in this study.

*Motivation to learn.* At the beginning of both classroom sessions, trainees’ motivation to learn was measured using the 8-item scale (session 1,  $\alpha = .87$ ; session 2,  $\alpha = .89$ ) developed by Noe and Schmitt (1986). Items were modified to be consistent with our training setting and were rated on a five-point scale ranging from “strongly disagree” (1) to “strongly agree” (5). A sample item is “I am motivated to learn the skills emphasized in this training program.” Participants’ motivation scores at the two sessions were averaged to create an overall measure of motivation to learn.

*Reactions to training.* Participants’ reactions to training were assessed using a 6-item scale ( $\alpha = .90$ ) that assessed their attitudes regarding the quality and usefulness of the training program. All items were rated on a five-point scale ranging from “strongly disagree” (1) to “strongly agree” (5). A sample item is “Overall, I was satisfied with the quality of instruction for

this course.” To ensure the unidimensionality of the reactions to training measure, we conducted an exploratory principal components factor analysis. Following the Kaiser normalization criterion guideline of selecting components with eigenvalues greater than one, the analysis produced a single factor solution (eigenvalue = 4.11; variance = 68.45%; all item loadings greater than .70).

*Self-efficacy.* Self-efficacy was assessed using a 6-item scale ( $\alpha = .93$ ) adapted from Ford, Smith, Weissbein, Gully, and Salas (1998). This measure assessed self-efficacy with a Likert-type scale rather than with ratings of confidence about particular aspects of the task (Hysong & Quinones, 1997; Lee & Bobko, 1994). All items were rated on a five-point scale ranging from “strongly disagree” (1) to “strongly agree” (5). A sample item is “I am certain I can manage the requirements of DPM.”

*Behavioral intentions.* A 10-item scale ( $\alpha = .96$ ) administered at the end of second classroom session was used to assess trainees’ intentions to incorporate the skills learned in the training program into their everyday driving behavior. All items were rated on a five-point scale ranging from “strongly disagree” (1) to “strongly agree” (5). A sample item is “I intend to apply what I learn from the course to my everyday driving.” We again used an exploratory principal components factor analysis to confirm the unidimensionality of the behavioral intentions measure. The analysis revealed that the ten items loaded onto a single factor (eigenvalue = 7.37; variance = 73.68%; all item loadings greater than .75).

### *Analyses*

An examination of the data revealed that there were no significant differences in reactions, motivation to learn, or training outcomes as a result of age, gender, race (Caucasian vs. Non-Caucasian), or experience, and these variables were, therefore, omitted from future

analyses. The hypothesized structural model was tested using structural equation modeling. We used Mplus 3.12 to test the model (Kline, 2005; Muthén & Muthén, 2004), with variables treated as directly observed. Although not depicted in the model, we estimated a noncausal association among distributive justice and utility perceptions to reflect the interrelationship of these two dimensions of assessment reactions. Since all hypotheses were directional, one-tailed tests of significance were used.

### Results

The means, standard deviations, and intercorrelations among the study variables are presented in Table 1. In Table 2 we present the full-model fit statistics for the hypothesized structural model. First, we present the chi-square value and the normed chi-square ( $\chi^2/\text{df}$ ), for which a ratio of 2.0 or less indicates good fit (Arbuckle, 1997). Next we present the comparative fit index (CFI), with values above .90 generally indicating favorable fit (Hu & Bentler, 1999). Finally, we present the root-mean-square error of approximation (RMSEA), its 90 percent confidence interval, and the standardized root-mean-square residual (SRMR). RMSEA and SRMR values between .05 and .10 indicate reasonable fit, and values below .05 indicate close approximate fit (Kline, 2005). The fit statistics presented in Table 2 indicate that the hypothesized model yielded poor fit to the data. Hence, we examined the modification indices in an effort to identify theoretically relevant model respecifications that may improve overall model fit.

The modification indices suggested the addition of three paths to the model. First, a direct path was added between trainees' utility perceptions and their reactions to the training program. Second, a path from trainees' distributive justice perceptions to their training reactions was also estimated. The addition of these two paths suggests that the relationships between

trainees' assessment reactions and their reactions to the training program are only partially mediated by motivation to learn. This is consistent with Colquitt et al. (2000), who found a partially mediated model of motivation to learn fit better than a completely mediated model. Finally, a path was modeled from training reactions to behavioral intentions. As would be expected, trainees who reacted more positively to the training were more likely to indicate positive intentions toward transferring what they have learned to their everyday driving.

The alternative structural model containing these three additional paths was tested. As can be seen in Table 2, the alternative model exhibited improved fit. A chi-square difference test revealed that the alternative model fit the data significantly better than the hypothesized model ( $\Delta\chi^2 = 73.18$ ,  $df = 3$ ,  $p < .01$ ). Further, the alternative model yielded a more favorable RMSEA value, with no overlap between the upper bound of the confidence interval of the alternative model and the lower bound of the confidence interval for the hypothesized model. Accordingly, the alternative model was retained. The structural equation modeling results for the alternative model are presented in Figure 2 and discussed below.

Hypotheses 1 and 2 predicted that trainees' motivation to learn would be positively related to their distributive justice perceptions and utility perceptions, respectively. The model accounted for 19.1% of the variance in trainee's motivation to learn. Both distributive justice perceptions and utility perceptions exhibited significant, positive relationships with motivation to learn. The magnitude of these effects was nearly identical, suggesting that the two dimensions of trainees' assessments reactions play an equally important role in driving motivation to learn. Thus, Hypotheses 1 and 2 were supported.

Hypotheses 3 and 4 predicted that trainees' pre-training assessment performance would be positively related to their perceptions of distributive justice and utility perceptions,

respectively. Overall, the model accounted for 19.4% of the variance in trainees' distributive justice perceptions. However, trainees' performance on the pre-training assessment was not a significant predictor of distributive justice perceptions. Hypothesis 3, therefore, was not supported. The model explained 18.0% of the variance in trainees' utility perceptions. Contrary to expectations, trainees' performance on the pre-training assessment exhibited a significant, negative relationship with utility perceptions. This finding is inconsistent with research in the performance management arena which has shown that individuals generally respond more favorably to feedback with a positive sign (e.g. Brett & Atwater, 2001). However, if individuals are focused on development rather than evaluation this pattern of results is more logical. Specifically, trainees who performed more poorly would likely perceive the feedback as more diagnostic and developmental, which may have bolstered their perceptions of the pre-training assessment as a useful exercise. This suggests that the perceived utility of negative feedback may depend on whether the assessment context is framed as evaluative or developmental.

Hypothesis 5 predicted that learning orientation and pre-training assessment performance would interact in their effect on trainees' assessment reactions, such that trainees high in learning orientation would react more positively to negative feedback than trainees low in learning orientation. Figure 2 shows that learning orientation was significantly and positively related to both trainees' utility perceptions and their distributive justice perceptions. Although a significant interaction was not observed for utility perceptions, learning orientation and pre-training assessment performance significantly interacted to effect trainees' distributive justice. This interaction is shown in Figure 3. Using the method described by Aiken and West (1991, pp. 19-21), we performed tests to determine whether the simple regression lines for low and high levels of learning orientation differ significantly at the high (i.e., one SD above the mean) and low (i.e.,

one SD below the mean) values of assessment performance. This analysis revealed that when individuals received low ratings on the pre-training assessment there was a significant, positive relationship between learning orientation and distributive justice perceptions ( $\beta = .390, p < .01$ ). The analysis also revealed that there was no significant relationship among learning orientation and distributive justice when individuals received high ratings on the pre-training assessment ( $\beta = -.107, ns$ ). These findings provide partial support for our hypothesis that trainees high in learning orientation would exhibit more positive reactions than trainees low in learning orientation when presented with negative feedback.

In Hypothesis 6 we predicted that performance orientation would moderate the relationship between pre-training assessment performance and assessment reactions such that trainees high in performance orientation would react more negatively to negative feedback than trainees low in performance orientation. Neither of the dimensions of performance orientation exhibited a significant direct relationship with utility perceptions, but performance-avoid orientation significantly interacted with assessment performance to predict perceived utility. This interaction is depicted in Figure 4. Using the technique described by Aiken and West (1991, pp. 14-19), we conducted simple slope tests to provide an indication of whether the relationship between assessment performance and utility was significant within each level (low vs. high) of performance-avoid orientation. This analysis revealed a non-significant relationship between assessment performance and perceived utility among individuals low in performance-avoid orientation ( $\beta = -.015, ns$ ). However, there was a significant, negative relationship between assessment performance and perceived utility among trainees high in performance-avoid orientation ( $\beta = -.379, p < .01$ ). As expected, this pattern of results indicates that the impact of trainees' performance on their utility perceptions was greater among trainees high in

performance-avoid orientation. However, contrary to expectations the results indicate that individuals high in avoid orientation perceived greater utility when they performed more poorly on the assessment. Again, this pattern of results may be explained by the developmental nature of the assessment. That is, trainees high in performance-avoid orientation may have reacted more positively to a negative assessment because the developmental feedback would help them improve their driving performance and avoid errors in the future..

Figure 2 also reveals that performance-avoid orientation exhibited a significant negative relationship with trainees' distributive justice perceptions. In addition, both performance-prove and performance-avoid orientations moderated the relationship between pre-training assessment performance and trainees' distributive justice perceptions. The significant interaction among performance-prove orientation and assessment performance on distributive justice perceptions is presented in Figure 5. This figure reveals that trainees high in performance-prove orientation reported more positive distributive justice perceptions than individuals low in performance-prove orientation when they performed well on the pre-training assessment, but more negative justice perceptions when they received low ratings on the pre-training assessment. This pattern of results provides support for our hypothesis that individuals high in performance-prove orientation would react more negatively to negative feedback than individuals low in performance-prove orientation. However, these findings should be interpreted cautiously since a comparison of regression lines did not reveal a significant difference among individuals high and low in performance-prove orientation at the different levels of assessment performance ( $\beta = -.191, ns$  at low performance;  $\beta = .232, ns$  at high performance).

The significant interaction among performance-avoid orientation and assessment performance on distributive justice perceptions is shown in Figure 6. The analysis of regression

lines revealed, contrary to expectations, that performance-avoid orientation was not significantly related to distributive justice perceptions when individuals received low ratings on the pre-training assessment ( $\beta = -.005, ns$ ). However, there was a significant, negative relationship between performance-avoid orientation and distributive justice perceptions when individuals performed well on the pre-training assessment ( $\beta = -.658, p < .01$ ). While unexpected, this finding is consistent with the earlier results reported for trainees' utility perceptions and suggests that trainees high in performance-avoid orientation may have reacted more favorably to the negative feedback because its diagnostic and developmental nature would help them avoid unsafe driving behaviors and accidents.

Hypothesis 7 predicted that motivation to learn would be positively related to individuals' reactions to training, post-training self-efficacy, and behavioral intentions. The results revealed that motivation to learn significantly and positively predicted trainees' self-efficacy, explaining 19.1% of the variance. Motivation to learn also exhibited a significant, positive relationship with individuals' reactions to training. Moreover, trainees' reactions to the pre-training assessment (both utility and distributive justice) were significantly and positively related to training reactions. Overall, these three predictors accounted for 45.3% of the variance in individuals' reactions to training. The model also explained 58.9% of the variance in trainees' behavioral intentions. Both motivation to learn and training reactions exhibited significant, positive relationships with trainees' intentions to transfer the training to their everyday driving. In summary, the hypothesized relationship between motivation to learn and the proximal training outcomes was supported.

Finally, Hypothesis 8 predicted that the proximal training outcomes would be positively related to trainees' post-training assessment performance after controlling for pre-training skill

level. The model accounted for 15% of the variance in trainees' post-training assessment performance. As expected, pre-training performance exhibited a significant, positive relationship with post-training performance. After controlling for pre-training skill level, only self-efficacy emerged as a significant predictor of post-training performance. As expected, self-efficacy was positively related to post-training performance. Neither training reactions nor behavioral intentions significantly predicted performance. Thus, Hypothesis 8 was partially supported.

### Discussion

This research provides support for Noe's (1986) argument that reactions to skill assessment have important consequences for trainees' motivation to learn. One contribution of this research is that we examined two related, yet distinct, dimensions of assessment reactions – utility and distributive justice. Our findings revealed that these two dimensions emerged as equally important predictors of trainees' motivation to learn. Trainees who had more positive perceptions of the utility of the assessment process were more motivated to learn in the subsequent training program. This finding supports Noe's (1986) assertion that trainees who perceive the needs assessment as providing useful information regarding skill strengths and weakness will be more motivated to improve their skill weaknesses through participation in a related training program. We also found that trainees' with more positive distributive justice perceptions were more motivated to learn. These results provide evidence that the credibility of the needs assessment outcomes is an important factor in driving motivation to learn. An important issue for future research to examine is whether perceptions of other elements of the assessment process, including the procedures and interpersonal treatment, influence trainees' motivation.

This study also aimed to address Colquitt et al.'s (2000) call for more research on the role of personality characteristics in models of motivation to learn. We argued that trait goal orientation may serve a framework through which individuals interpret and react to their pre-training assessment performance. We found that trainees high in learning orientation reacted more favorably to the skill assessment than trainees low in learning orientation. Furthermore, we found evidence to support our argument that learning orientation moderates the relationship between trainees' assessment performance and their reactions. In particular, learning orientation appears to have an important influence on how trainees' react to negative assessment feedback. Specifically, when trainees performed well on the pre-training assessment, the relationship between learning orientation and reactions was non-significant. However, when they performed poorly on the pre-training assessment, trainees high in learning orientation reported more positive distributive justice perceptions than trainees low in learning orientation.

The effects of performance-prove orientation in the current study were limited, although we did observe a significant interaction of performance-prove orientation and pre-training assessment performance on distributive justice perceptions. This interaction revealed that high levels of performance-prove orientation led to more negative reactions to negative feedback and more positive reactions to positive feedback. While these results are in line with the predicted pattern, the interaction effect was modest and a comparison of regression lines at low and high levels of assessment performance suggest that these differences were not significant.

Probably the most intriguing findings for goal orientation were observed for the performance-avoid dimension. Consistent with the arguments of VandeWalle (2003), performance-avoid orientation was a more consistent predictor of trainees' assessment reactions than performance-prove orientation. In particular, we found a negative relationship between

performance-avoid orientation and trainees' perceptions of distributive justice. In addition, the results revealed that performance-avoid orientation moderated the relationship between assessment performance and both utility and distributive justice perceptions. Contrary to our expectations, however, both of these interactions suggest that trainees high in performance-avoid orientation had more positive reactions to the skill assessment when they received low performance ratings. These findings conflict with prior research that has shown a negative relationship between performance-avoid orientation and reactions to negative feedback (VandeWalle, 2003; VandeWalle et al., 2001). One potential explanation for these conflicting findings concerns differences in feedback contexts (Ashford, Blatt, & VandeWalle, 2003). Specifically, much of the prior research examining the effects of goal orientation on reactions to feedback has been conducted in the context of college classes, a setting that several authors have noted is characterized by a climate of competition and evaluation (e.g., Cron, Slocum, VandeWalle, & Fu, 2005; Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002). In contrast, the feedback context in the current research was non-competitive and emphasized personal development, growth, and improvement. In purely developmental contexts, negative feedback may not present the typical threat to the ego and self-esteem of individuals high in performance-avoid orientation. As a result, the drivers may have viewed the negative feedback as valuable information for improving their performance and demonstrating their competence in their future career. Some evidence for this argument is provided by the fact that we found an inverse relationship between trainees' performance on the skill assessment and their perceptions of utility. Ultimately, these results are interesting because they suggest that there may be conditions under which avoidance orientated individuals do not exhibit aversive reactions to

negative feedback, and in fact may respond favorably. Yet, future research is needed to further explore the implications of performance-avoid orientation in different feedback contexts.

The final set of relationships examined in this study focused on the effects of motivation to learn on several measures of training effectiveness. These relationships were generally consistent with previous research and provide evidence for the importance of motivation to learn in the current training context. Trainees who exhibited higher levels of motivation to learn had more positive reactions to the training as well as higher levels of post-training self-efficacy. The magnitude of these relationships was generally consistent with those reported by Colquitt et al. (2000) in their training motivation meta-analysis. Training reactions also exhibited a significant, positive relationship with trainees' utility and distributive justice perceptions. This suggests that the positive relationship between trainees' assessment reactions and their reactions to the training program was only partially mediated by motivation to learn. We also found that trainees who were more motivated to learn had more positive behavioral intentions. This finding is important since one of the primary goals of safety training is to encourage trainees to integrate their new skills into their everyday activities and routines. Finally, we found that trainees with higher levels of post-training self-efficacy performed significantly better on the post-training assessment. It is important to note that the relationship was found even after controlling for trainees' pre-training skill level.

#### *Limitations and Directions for Future Research*

Several limitations of this study can be identified to help guide future research. One limitation is the self-report nature of a number of the measures utilized in this study, which creates the potential for common method variance to bias the results. As noted earlier, the research design employed six different measurement periods in an effort to control for common

method bias. This introduced a time lag between the predictor and criterion variables, which helps to control for several potential sources of common method bias, such as consistency motif, transient mood state, context effects, and demand characteristics (Podsakoff et al., 2003). There is some evidence that these efforts may have been successful. First, the fact that several of the observed relationships were non-significant suggests that an overall response bias does not account for the findings. Second, where it is possible to compare observed relationships to culminated research findings (e.g., motivation to learn – training outcome relationships), one finds effects of a similar magnitude and little evidence of inflation. Nonetheless, future research can benefit by including measures from a variety of sources, such as observational measures of trainee effort or persistence.

A second issue is that our examination of antecedents of trainees' assessment reactions was limited to pre-training assessment performance and trait goal orientation. Other individual differences may play an important role in shaping individuals' reactions to assessment and developmental feedback. For example, Ryan et al. (2000) found that racial similarity of the feedback recipient and giver was the most consistent predictor of receptivity to management development feedback. Likewise, elements of the assessment process and the assessment context may influence trainees' reactions. For example, research in the selection arena has also demonstrated that characteristics of procedures (e.g., transparency) and outcomes (e.g., explanations, face validity) have a significant effect on applicant perceptions (Hausknecht et al., 2004; Ryan & Ployhart, 2000). While it is important not to simply assume these results generalize to training settings, research from other domains can be used to help guide future studies on factors that may impact trainees' reactions to assessment.

A final issue concerns the fact that in this study all individuals who participated in the pre-training assessment attended the training sessions. This is likely due, at least in part, to the fact that the assessment process and classroom training were framed as integrated components of an overall training program. It is often the case, however, that skill assessments are only loosely tied to specific developmental opportunities. A good example is multi-source feedback systems, which are frequently used to highlight individuals' weaknesses and developmental needs with the goal of stimulating self-directed learning and development (Brett & Atwater, 2001; Smither, London, Flautt, Vargas, & Kucine, 2003). In these situations, an important issue concerns the extent to which the assessment process motivates individuals to seek out development opportunities. Our results suggest that individuals who react more positively to the assessment process may be more motivated to identify and engage in development activities that will allow them to address their skill gaps, but we were unable to directly address this issue in the current investigation. Future research should, therefore, examine the effects of trainees' assessment reactions in different training settings with alternative conceptualizations of trainees' motivation to learn (Noe, et. al, 1997).

#### *Implications for Human Resource Development*

The results of the current study have several implications for future practice in the field of human resource development. First, the importance of training needs assessment for designing effective training has been well documented and is widely acknowledged within the field. For example, the 2004 State of the Industry report by the American Society for Training & Development revealed that top learning organizations map learning resources to competencies, individual development plans, jobs, and corporate goals (Sugrue & Kim, 2004). Practitioner are then urged to develop a systematic approach to identify skill gaps in employees so as to

determine who needs to be trained and what types of learning experiences would be helpful to eliminate a skill gap (Goldstein & Ford, 2002).

In particular, the results of our study suggest that trainees' reactions to the skill assessment process have a significant impact on their motivation to learn, which in turn drives important learning outcomes. The importance of the assessment process for shaping individuals' attitudes toward training is not surprising when one considers that it is during this phase that trainees first become personally involved in the training process. Our research, though, suggests that identifying skill gaps is not simply an issue of developing a systematic approach to measurement. It also requires attention to developing a process that is ultimately seen as fair by prospective trainees. This highlights the need to consider the psychological impact of our needs assessment processes and to include steps to maximize the changes that the process will be seen as fair. For example, the literature on justice would suggest that employees should have a voice in the development of the assessment instrument, that the criterion for success is clearly noted to the employee prior to the assessment process, and that the scoring process is described prior to providing the results (Gilliland & Paddock, 2005). In addition, Latham, Almost, Mann, and Moore (2005), recommend training appraisers and coaches on principles of organizational justice so the assessment process is seen as fair. In addition, appraisers should be trained on how to provide feedback so that trainees will be more likely to perceive assessment feedback as meaningful and useful. As future research identifies the structural and social elements of the skill assessment process that influence individuals' utility and justice perceptions, organizations will be able to use this information to design and conduct skill assessments that are perceived as fair, credible, and useful - ultimately enhancing their employees' motivation to learn.

Our results also suggest, however, that trainees are likely to react differently to skill assessments depending on their individual characteristics, such as goal orientation. This suggests that HRD practitioners need to avoid a “one size fits all” approach to skill assessments and focus instead on tailoring the process to different trainees. For example, our results indicate that negative skill assessment feedback may be particularly damaging to the reactions and motivation of individuals low in learning orientation. If training practitioners understand these individual differences and their influence on trainees’ assessment reactions, they can tailor the process to meet the needs of specific trainees. VandeWalle (2003), for example, notes that in addition to a learning orientation occurring as an individual difference, situational cues can be used to make a learning orientation state salient. Thus, assessors may compensate for individuals’ low levels of learning orientation by emphasizing the value of learning and the developmental nature of the feedback during the assessment process. Hopefully future research will provide additional insight into how individual differences can be leveraged so as to shape trainees’ reactions and maximize their motivation to learn.

### Endnotes

<sup>1</sup> VandeWalle (2003) suggests that both the prove and avoid dimensions of performance orientation should create negative perceptions of feedback, although the strength of this effect may be greater for the avoid dimension.

### Author Biographies

Bradford S. Bell is an assistant professor in the School of Industrial and Labor Relations at Cornell University. He received his B.A. in psychology from the University of Maryland at College Park and his M.A. and Ph.D. in industrial and organizational psychology from Michigan State University. His research focuses on issues surrounding training and development, both at the individual- and team-levels. At the individual level, his work is characterized by a learner-centered perspective of training and development that seeks to understand the interplay of individual differences and training design for promoting training effectiveness. At the team level his work focuses on the process of team learning and the development of generic teamwork competencies. His work has appeared in a number of book chapters and journals, including *Journal of Applied Psychology*, *Personnel Psychology*, and *Group and Organization Management*. He has also consulted for a number of both public and private organizations.

J. Kevin Ford is a professor of psychology at Michigan State University. His major research interests involve improving training effectiveness through efforts to advance our understanding of training needs assessment, design, evaluation and transfer. Dr. Ford also concentrates on building continuous learning and improvement orientations within organizations. His work has appeared in a number of book chapters and journals including the *Journal of Applied Psychology*, *Personnel Psychology*, *Psychological Bulletin*, and *Organizational Behavior and Human Decision Processes*. He is an active consultant with private industry and the public sector on training, teamwork, and organizational development issues. He is a Fellow of the American Psychological Association and the Society of Industrial and Organizational Psychology. He received his BS in psychology from the University of Maryland and his MA and Ph.D. in psychology from The Ohio State University.

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Table 1

Means, Standard Deviations, and Intercorrelations

| Variable                           | M    | SD   | 1      | 2     | 3      | 4     | 5     | 6     | 7     | 8     | 9     |
|------------------------------------|------|------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
| 1. Learning Orientation            | 5.31 | 0.55 | (.81)  |       |        |       |       |       |       |       |       |
| 2. Performance-prove Orientation   | 3.90 | 1.12 | .16*   | (.86) |        |       |       |       |       |       |       |
| 3. Performance-avoid Orientation   | 2.59 | 1.02 | -.26** | .43** | (.82)  |       |       |       |       |       |       |
| 4. Distributive Justice            | 4.28 | 0.61 | .27**  | -.09  | -.29** | (.86) |       |       |       |       |       |
| 5. Utility Perceptions             | 4.78 | 0.35 | .31**  | -.04  | -.12   | .40** | (.84) |       |       |       |       |
| 6. Motivation to Learn             | 4.31 | 0.48 | .40**  | .02   | -.24*  | .37** | .38** | (.88) |       |       |       |
| 7. Training Reactions              | 4.66 | 0.42 | .43**  | .05   | -.15   | .42** | .49** | .58** | (.90) |       |       |
| 8. Behavioral Intentions           | 4.69 | 0.42 | .30**  | -.02  | -.17   | .41** | .43** | .59** | .75** | (.96) |       |
| 9. Self-Efficacy                   | 4.38 | 0.50 | .36**  | .12   | -.15   | .31** | .37** | .44** | .46** | .45** | (.93) |
| 10. Pre-Training Assessment Perf.  | 0.42 | 0.24 | .04    | .02   | -.02   | -.09  | -.19* | -.10  | .03   | -.08  | .02   |
| 11. Post-Training Assessment Perf. | 0.64 | 0.26 | .18    | -.02  | -.03   | .06   | .00   | .05   | .11   | .10   | .20*  |

Note: \* p < .05. \*\* p < .01 (one-tailed). Internal consistency reliabilities of the measures are reported on the diagonal in parentheses.

Table 1 (cont.)

Means, Standard Deviations, and Intercorrelations

| Variable                           | 10    | 11    |
|------------------------------------|-------|-------|
| 1. Learning Orientation            |       |       |
| 2. Performance-prove Orientation   |       |       |
| 3. Performance-avoid Orientation   |       |       |
| 4. Distributive Justice            |       |       |
| 5. Utility Perceptions             |       |       |
| 6. Motivation to Learn             |       |       |
| 7. Training Reactions              |       |       |
| 8. Behavioral Intentions           |       |       |
| 9. Self-Efficacy                   |       |       |
| 10. Pre-Training Assessment Perf.  | (.83) |       |
| 11. Post-Training Assessment Perf. | .35** | (.87) |

Note: \*  $p < .05$ . \*\*  $p < .01$  (one-tailed)

Table 2

Fit Statistics for Structural Models

| Statistic                                       | Hypothesized Model | Alternative Model |
|---|--------------------|-------------------|
| $\chi^2$  | 130.99             | 57.81             |
| $\chi^2/df$                                     | 2.85               | 1.34              |
| Comparative Fit Index (CFI)                     | .69                | .95               |
| Root-mean-square error of approximation (RMSEA) | .131               | .056              |
| 90 percent confidence interval for RMSEA        | .105, .157         | .000, .091        |
| Standardized Root Mean Square Residual (SRMR)   | .104               | .077              |

Note: Alternative model contains three additional paths: utility perceptions → training reactions; distributive justice → training reactions; and training reactions → behavioral intentions. For Hypothesized Model,  $n = 113$ ,  $df = 46$ ; for Alternative Model,  $n = 113$ ,  $df = 43$ . Chi-square for Hypothesized Model significant at  $p < .01$ . Chi-square for Alternative Model non-significant.

Figure 1

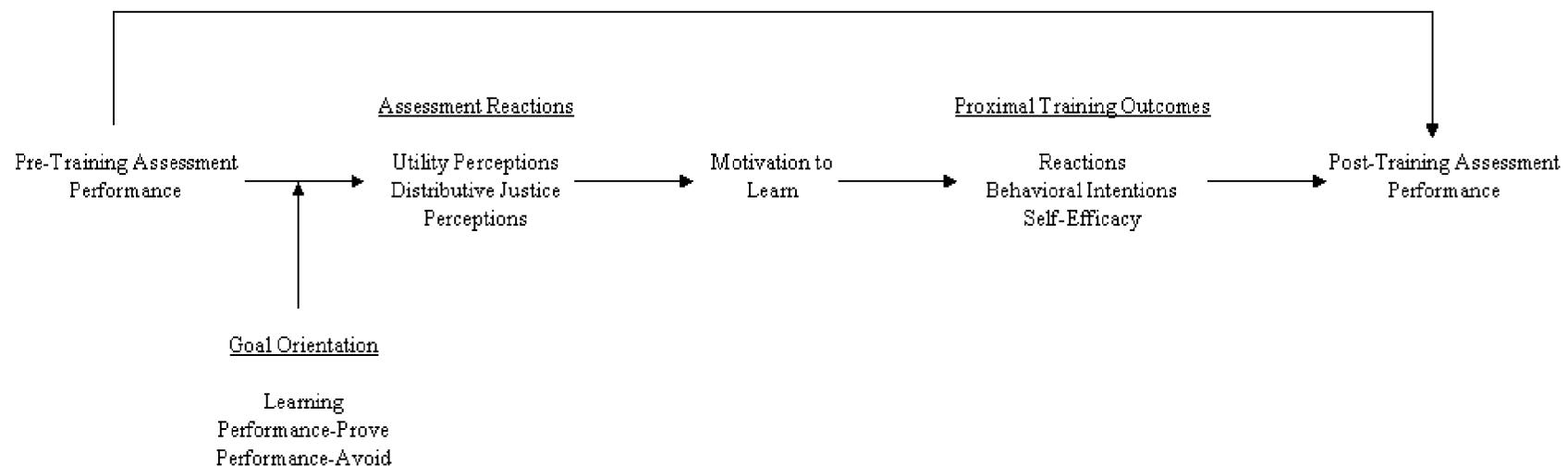
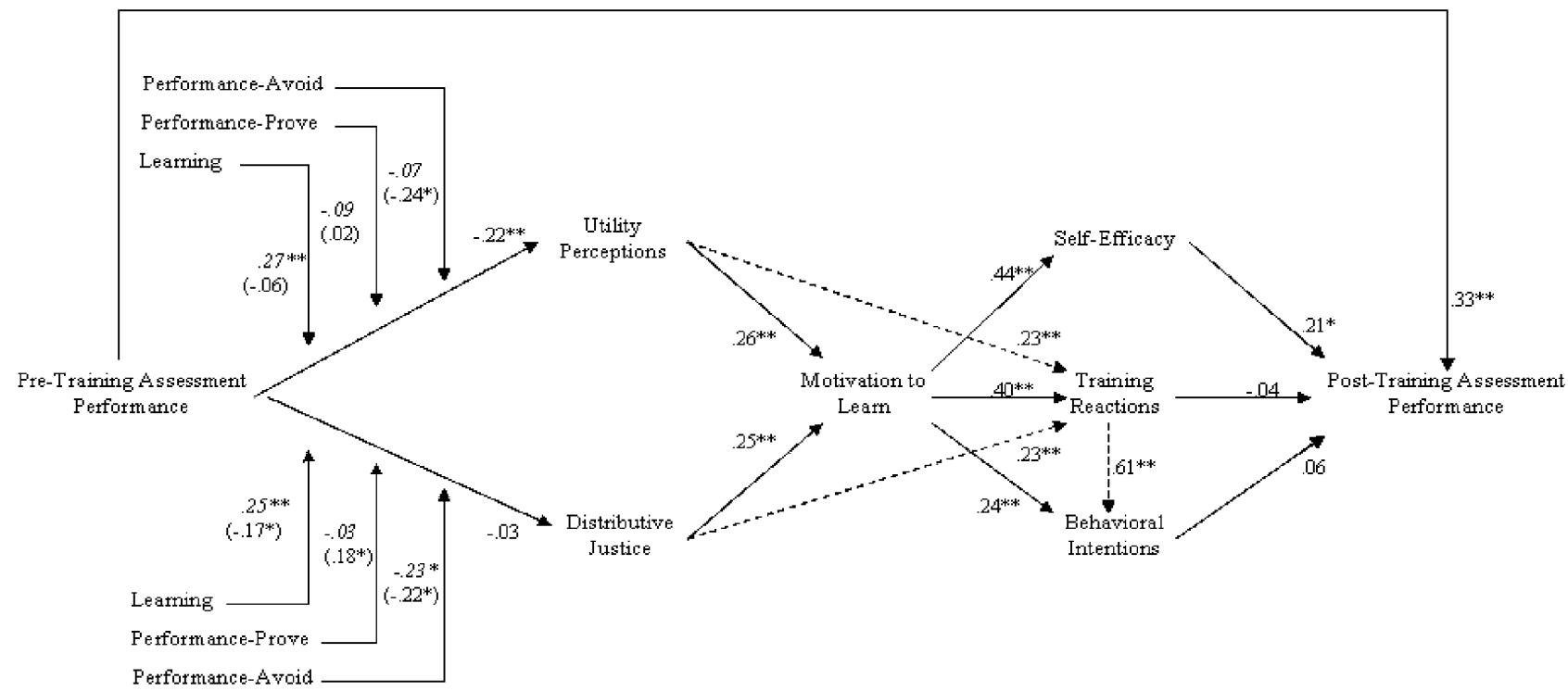
Conceptual Model of Reactions to Skill Assessment

Figure 2

Structural Equation Modeling Results

Note: Standardized path coefficients reported. For trait goal orientation paths, main effect reported in italics and interactive effect reported in parentheses. When a significant interaction term is present, the main effects are conditional, although the direct relationship can be interpreted as the average effect (Aiken & West, 1991). Dashed paths represent model respecifications.

Figure 3

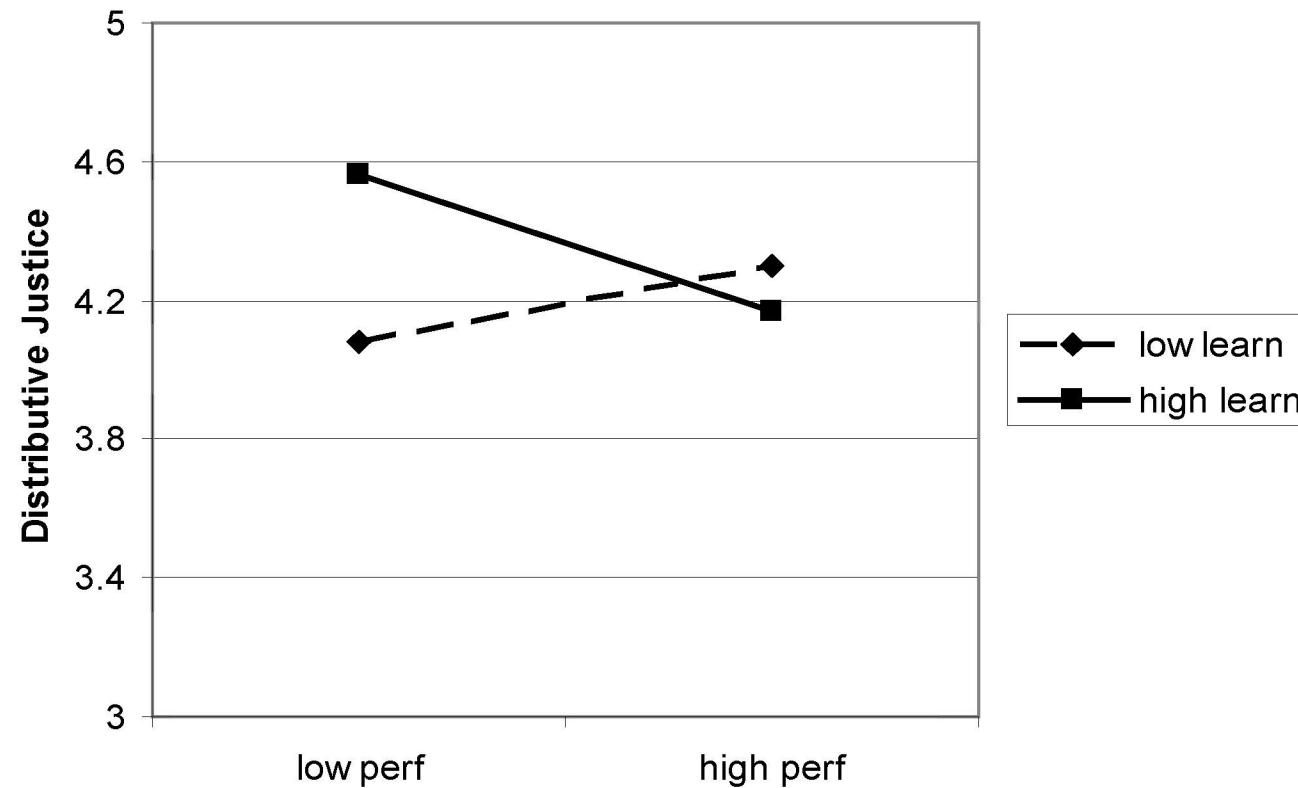
Interaction Between Learning Orientation and Assessment Performance on Distributive Justice Perceptions

Figure 4

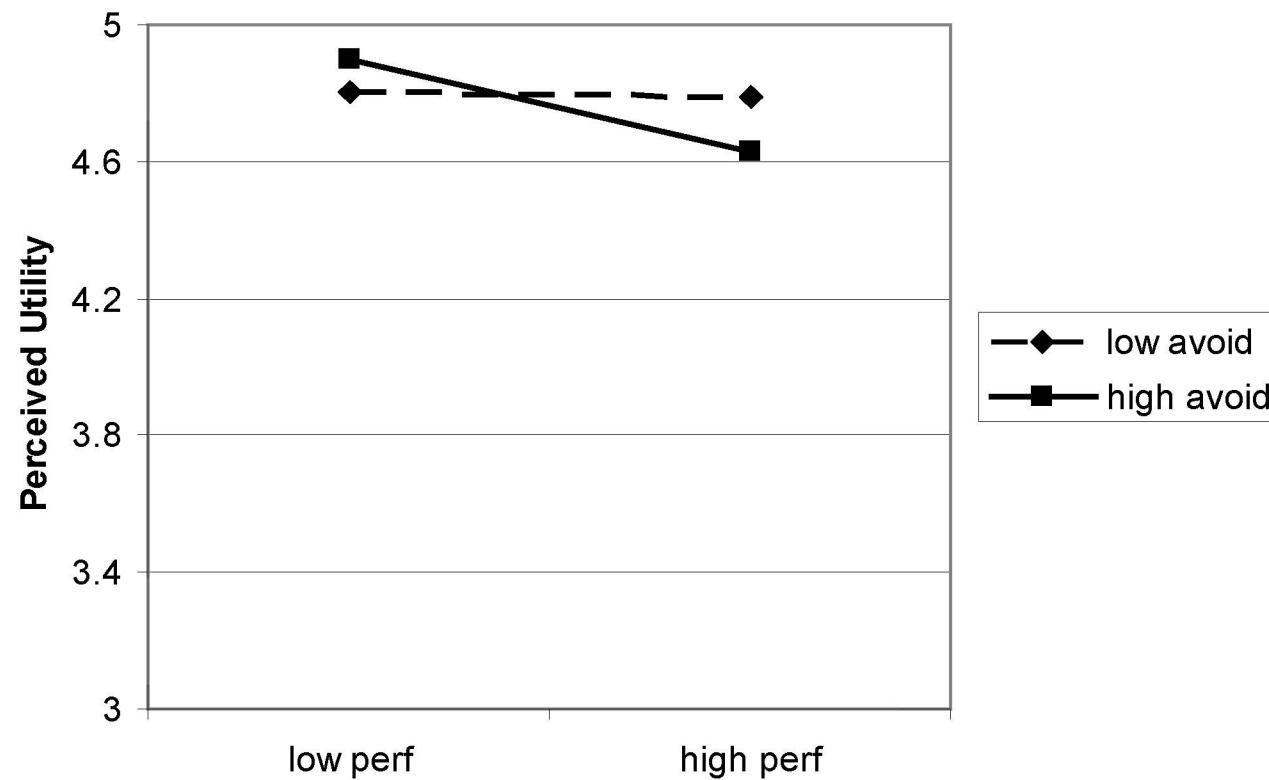
Interaction Between Assessment Performance and Performance-Avoid Orientation on Utility Perceptions

Figure 5

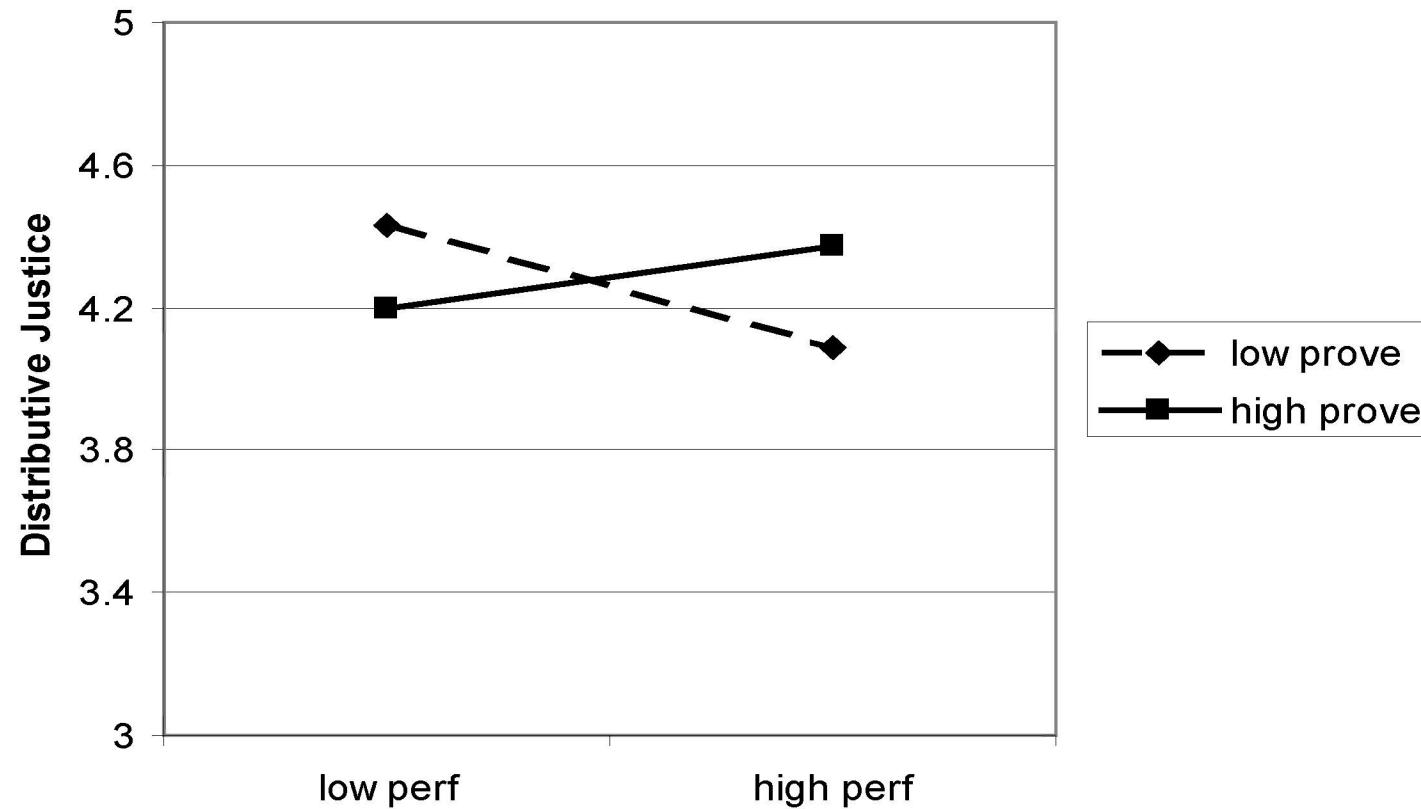
Interaction Between Performance-Prove Orientation and Assessment Performance on Distributive Justice Perceptions

Figure 6

Interaction Between Performance-Avoid Orientation and Assessment Performance on Distributive Justice Perceptions