A Covariance Structure Analysis of Employees’ Response to Performance Feedback

Angelo J. Kinicki
Arizona State University

Bin (Joshua) Wu
Arizona State University

Gregory E. Prussia
Seattle University

Frances M. McKee-Ryan
Oregon State University

This longitudinal study used D. R. Ilgen, C. D. Fisher, and M. S. Taylor’s (1979) feedback process model as a theoretical framework to determine whether a sequential chain of cognitive variables mediates an individual’s response to performance feedback. One hundred two employees were surveyed 2 weeks after their performance appraisal, and performance was assessed 11 months later at the end of the review cycle. Covariance structure analysis supported the convergent and discriminant validity of the constructs underlying the model and the constellation of structural relationships. A set of cognitive variables was found to completely mediate the relationship between an individual’s receipt and response to feedback. Implications for the feedback process and future research are discussed.

Performance feedback represents information about the effectiveness of one’s work behavior. The giving and receiving of performance feedback is ubiquitous in organizations, and the design and maintenance of feedback systems are essential for both individual and organizational performance (Fedor, 1991; M. S. Taylor, Fisher, & Ilgen, 1984). This awareness led to considerable research into one of two broad streams: individuals as passive feedback receivers (e.g., Ilgen, Fisher, & Taylor, 1979) and individuals as active feedback seekers (Ashford & Cummings, 1983). The first stream is represented by studies that examined relationships between feedback receivers (e.g., Podsakoff & Farh, 1989; Stone & Stone, 1985); and the acceptance of feedback (e.g., Fletcher, Taylor, & Glanfield, 1996) on an individual’s response to feedback. The second stream focuses on identifying the antecedents of feedback-seeking behaviors (e.g., VandeWalle, Ganesan, Challagalla, & Brown, 2000). The focus of the present study is to contribute to the first stream of literature by analyzing a sequential chain of cognitive variables proposed to mediate an individual’s response to feedback.

There are four theoretical process models outlining a variety of cognitive processes that mediate the relationship between the receipt of performance feedback and an individual’s response to feedback (Fedor, 1991; Ilgen et al., 1979; Kluger & DeNisi, 1996; M. S. Taylor et al., 1984). Despite the presence of these models, however, the bulk of past research has been bivariate and has not examined the proposed mediating processes outlined in these frameworks. Fedor (1991) noted this shortcoming and concluded that “there is still a need to address more fully how feedback is perceived and reacted to by recipients” (p. 74). His conclusion is still true today. Therefore, the purpose of this study is to longitudinally examine a chain of cognitive variables that potentially mediates the relationship between an employee’s receipt of performance feedback and his or her subsequent performance. We use the model put forth by Ilgen et al. (1979) as our conceptual framework for generating hypotheses regarding employees’ response toward feedback for three specific reasons.

First, Ilgen et al.’s (1979) model represents the foundation of all subsequent process feedback models, and it is the model used most frequently by researchers to generate hypotheses regarding the effects of feedback (Fedor, 1991). Unfortunately, previous research examined concurrent relationships between feedback and a variety of other variables but failed to examine the process underlying employees’ behavioral response to feedback. Using Ilgen et al.’s (1979) model as a framework for generating hypotheses thus aids our understanding of the cognitive process underlying employees’ behavioral response, thereby helping to fill a void in the literature that has both theoretical and practical significance.

Second, Ilgen et al.’s (1979) model is a parsimonious representation of the feedback process. Consequently, their model is more amenable to testing mediation than more complex models such as the one proposed by Kluger and DeNisi (1996). Finally, though much of the research on feedback uses variables proposed in Ilgen's model, there is still a need to address more fully how feedback is perceived and reacted to by recipients.
et al.'s model, their associated psychometric properties have heretofore not been examined. Previous research either ignored or failed to assess the validity of various feedback measures prior to examining substantive relationships. This is a serious problem that undermines the interpretation of cumulative results from a stream of research because the use of measures with unknown psychometric properties can distort and bias empirical relationships (Kinicki, McKee-Ryan, Schriesheim, & Carson, 2002; LePine, Erez, & Johnson, 2002). Our use of covariance structure analysis enables examination of the convergent and discriminant validity of the proposed feedback constructs prior to interpreting structural relationships.

Model Overview and Hypothesized Relationships

The current model being tested is derived from Ilgen et al.'s (1979) model. Ilgen et al.'s model was based on research showing that the receipt of feedback does not always lead to the desired change in employee behavior. From this foundation, M. S. Taylor et al. (1984) concluded that “feedback may have no impact on the recipient at all, it may cause the individual to lash out angrily, or it may result in a response quite different from that desired by the source” (p. 82). Ilgen et al. speculated that divergent responses to feedback are due to a set of intermediate psychological or cognitive processes triggered by feedback. They thus proposed a model that includes a set of cognitive variables that mediates the relationship between an individual’s receipt of performance feedback and his or her ultimate response to feedback. Given this foundation, our primary goal is to longitudinally test the model presented in Figure 1.

Exogenous Influences on the Perceived Accuracy of Feedback

Ilgen et al. (1979) proposed that the acceptance of feedback plays a major role in employees’ response to feedback and defined it in terms of accuracy. Specifically, “acceptance refers to the recipient’s belief that the feedback is an accurate portrayal of his or her performance” (Ilgen et al., 1979, p. 356). We thus conceptualized the acceptance of feedback as perceived accuracy in our model. Figure 1 shows that perceived accuracy is proposed to be a function of both a feedback-rich environment and credibility of the feedback source.

There is some debate about the veracity of modeling the characteristics of a feedback message in terms of a construct repre-

Figure 1. Recursive theoretical model derived from Ilgen et al. (1979). H = hypothesis.
senting a feedback-rich environment. Previous conceptual (e.g., Atwater & Yammarino, 1997; Fedor, 1991; Ilgen et al., 1979) and empirical feedback studies (e.g., Brett & Atwater, 2001) were based on the assumption that the specificity, frequency, and sign of feedback were independently related to the perceived accuracy of feedback. There also is indirect support for this proposition. For example, perceived accuracy of feedback was positively associated with the favorability of feedback (Brett & Atwater, 2001; Stone & Stone, 1985), and the frequency of feedback was positively related to the perceived accuracy of feedback obtained in performance appraisal reviews (Fulk, Brief, & Barr, 1985; Landy, Barnes, & Murphy, 1978). In contrast to these studies however, Larson and his colleagues challenged the independence of various feedback characteristics (Larson, 1984; Larson, Glynn, Fleenor, & Scontrino, 1986).

Larson et al. (1986) noted that past studies demonstrated moderately high correlations among various feedback characteristics. They thus used confirmatory factor analysis to examine the factor structure associated with the feedback characteristics of timeliness, specificity, and frequency. Results revealed that these feedback characteristics were highly related and they all loaded on one underlying factor. Larson et al. concluded that the results offer little evidence that these dimensions actually exist as distinct features of managers’ performance feedback behavior. Instead, they appear to covary so strongly as to be empirically indistinguishable. . . . These results suggest that it may be more appropriate to examine the overall quality of managers’ performance feedback than to focus on each dimension separately. (pp. 1083–1084)

Kidwell and Bennett’s (1994) results are consistent with this conclusion. The frequency of feedback was significantly correlated with the sign of feedback ($r = .44$). We thus conceptualized a feedback-rich environment as a gestalt of feedback characteristics. In the current study, a feedback-rich environment is one in which employees receive feedback that is specific, frequent, and positive. We expected a feedback-rich environment to positively influence perceived accuracy based on past univariate studies.

Ilgen et al. (1979) noted that feedback comes from three principal sources: self, others, and the task. We focused on employees’ immediate supervisor or manager as the source of feedback because employees prefer to be evaluated by their immediate supervisor or manager rather than other sources (Gosselin, Werner, & Halle, 1997) and past research substantiates a relationship between supervisory source credibility and other feedback-related variables. For example, employees had more positive reactions to feedback provided by credible sources (Albright & Levy, 1995; Kidwell & Bennett, 1994), and an experimental study by Stone, Guetalt, and McIntosh (1984) demonstrated that perceived feedback accuracy was higher when subjects expected to receive feedback from an experienced as opposed to inexperienced rater. Fulk et al.’s (1985) results further showed that perceived feedback accuracy was positively correlated with employees’ assessments of their supervisors’ knowledge. Considering the above discussion, we predicted the following:

**Hypothesis 1:** A feedback-rich environment is positively related to the perceived accuracy of performance feedback.

**Hypothesis 2:** Credibility of the feedback source is positively associated to the perceived accuracy of performance feedback.

**Perceived Accuracy, Desire to Respond, and Intended Response**

The last two cognitive mediators, desire to respond to feedback and intended response, represent the motivational components within Ilgen et al.’s (1979) model. Although these two constructs appear conceptually similar, Ilgen et al. theorized that they independently contribute to the feedback process. No research to date has examined this proposition.

The relationship between perceived accuracy and desire to respond is based on self-consistency theory (Korman, 1970). Korman (1970) proposed that “individuals will be motivated to perform on a task or job in a manner which is consistent with the self-image with which they approach the task or job situation” (p. 32). Accordingly, an individual is expected to respond to performance feedback in a way that is consistent with his or her acceptance of the feedback. Positive or negative feedback that is perceived as an accurate assessment of performance (i.e., accepted) therefore is more likely to engender a positive desire to respond whereas the opposite desire occurs when a recipient believes feedback is an inaccurate portrayal of his or her performance. In support of this possibility, Brett and Atwater’s (2001) results showed that perceptions of feedback accuracy from peers and direct reports were positively associated with individuals’ reactions regarding their feedback. Further, both Ilgen et al. (1979) and Kluger and DeNisi (1996) suggested that the desire to respond to feedback is expected to activate a specific behavioral intention when the feedback is viewed as an antecedent to the receipt of a desired future reward. In other words, intended response increases when feedback activates outcome expectancies. For example, individuals are more likely to form intentions to respond to positive or negative feedback when they anticipate that such feedback is associated with the receipt of a future positive or negative consequence, respectively.

Maurer and Palmer’s (1999) results supported this proposition. They applied the theory of planned behavior (Ajzen, 1991) to investigate the predictors of managers’ intentions to respond to developmental feedback. Findings revealed that intentions to respond to developmental feedback were associated with perceived favorability of outcomes associated with improvement. All told, however, no studies to date have investigated the relationships between the perceived accuracy of feedback and the desire to respond to feedback or between the desire to respond to feedback and the intended response. On the basis of self-consistency theory and Maurer and Palmer’s findings, we proposed the following hypotheses:

**Hypothesis 3:** Perceived accuracy is positively associated with the desire to respond to feedback.

**Hypothesis 4:** Desire to respond to feedback is positively related to intended response toward feedback.
Intended Response and Performance

Consistent with the theory of reasoned action (Fishbein & Ajzen, 1975), Ilgen et al. (1979) proposed that intentions are the best and the most proximate predictor of an individual’s response to feedback. Although Maurer and Palmer’s (1999) results did not support this relationship in the context of receiving developmental feedback, Ilgen et al.’s prediction is consistent with the theory of planned behavior (Ajzen, 1991) and research on both turnover (Griffeth, Hom, & Gaertner, 2000) and consumer behavior (Ajzen, 1991). Thus, we predicted the following relationship:

Hypothesis 5: Intended response to feedback is positively related to performance.

Alternative Structural Models

Alternative structural models to Ilgen et al.’s (1979) model also have been hypothesized. Although Ilgen et al. proposed that a chain of cognitive variables mediate an individual’s response to feedback, it also is plausible that a feedback-rich environment and source credibility directly influence an individual’s desire to respond to feedback. For example, the frequency of positive feedback is likely to enhance the desire to respond, because of the secondary reinforcement properties of positive feedback (Ilgen et al., 1979). The reinforcement properties of positive feedback also are more probable when the feedback is specific because it allows individuals to more accurately set specific goals aimed at improving future performance (Mento, Steel, & Karren, 1987; Langeland, Johnson, & Mawhinney, 1998). Ilgen et al. also noted that the desire to respond to feedback is likely influenced by the feedback source. Feedback delivered by a credible and trusted source is expected to directly enhance the desire to respond because it can be viewed as having mentoring and developmental value (e.g., Anderson & Rodin, 1989) and it can enhance individuals’ feelings of competence, a key component of intrinsic motivation (Deci & Ryan, 2000; Thomas, 2000). The above discussion resulted in the following hypotheses:

Hypothesis 6: A feedback-rich environment is positively associated with the desire to respond to feedback.

Hypothesis 7: Credibility of the feedback source is positively related to the desire to respond to feedback.

Mediation of Cognitive Variables

The most critical proposition underlying Ilgen et al.’s (1979) model revolves around the notion that a cognitive chain of mediators influences an employee’s subsequent response to feedback (performance in our study). This proposition is an outgrowth of the information-processing approach to human performance and is consistent with both theoretical and empirical research on the performance appraisal process (see DeNisi, Cafferty, & Meglino, 1984). Appraisal researchers have clearly shown that the rating process is influenced by the manner in which raters observe, encode, store, and retrieve information. Despite this support, however, no studies to date have examined the veracity of whether a cognitive chain of variables mediates an individual’s response to feedback. Rather, studies tended to examine bivariate relationships with a variety of ad hoc measures. Based on the above discussion, we hypothesized the following:

Hypothesis 8: An individual’s response to performance feedback is mediated by a set of cognitive variables (i.e., perceived accuracy, desire to respond to feedback, and intended response).

Method

Sample and Procedure

A bank with 235 branches served as the setting for this study. Data were obtained from participants in different branches, who had the same job title and job description (i.e., loan officers). Surveys were administered and received from 182 loan officers working in 24 randomly selected branches. This sampling procedure represented a random sampling of 10 percent of the bank’s branches. Employees completed surveys on a voluntary basis during company time. Eighty percent of the respondents were women and the average age was 35.

Surveys were collected from employees 2 weeks after their most recent performance appraisal (Time 1). The bank conducted its annual performance reviews on a calendar basis, therefore performance reviews were all held during the same month. Respondents were required to identify themselves on the questionnaire in order to match surveys with individual performance ratings collected at the end of the performance cycle (Time 2, 1 year later), but the confidentiality of individual responses and voluntariness of participation were emphasized. Matched, usable data were obtained from 102 of the 182 employees.

Several factors affected our ability to match respondents’ Time 1 data with subsequent Time 2 performance data. Attrition prior to the subsequent performance rating, promotion out of loan officer positions, and inexact identification marks contributed to the compressed matched sample. In response, we conducted an analysis to examine possible differences between respondents included in the matched data set and those who were not. Specifically, we used a procedure recommended by Goodman and Blum (1996) to determine whether attrition bias contributed to the presence of nonrandom sampling. These authors suggest using multiple logistic regression to assess subject attrition. We therefore specified a regression equation in which the dependent variable was a dichotomous variable distinguishing employees who were included in the matched sample from those who were not. The independent variables in the equation were composed of the predictor variables in the feedback model. The resulting insignificant predictor coefficients together with an insignificant model chi-square did not indicate a nonrandom sampling bias. According to Goodman and Blum, if the regression results indicate no nonrandom sampling, “researchers can be reasonably confident that attrition will not bias their subsequent longitudinal data analyses” (p. 634) and need not further assess nonrandom sampling effects. This regression model was examined because it enabled response bias to be assessed based on the substantive variables of interest in the sample (Goodman & Blum, 1996).

Exploratory Factor Analyses (EFAs)

Covariance structure analysts recommend measurement model refinement prior to examining structural relationships (e.g., Anderson & Gerbing, 1988). For this reason, and because there is limited evidence to support the validity of various feedback measures, our empirical investigation began with EFAs. These analyses were conducted on the nonmatched sample (N = 80) that was not used in model testing. Results were used to create construct indicators for the baseline measurement model.

For most of the constructs in our model, a separate EFA was conducted to maintain an acceptable item to respondent ratio (Nunnally, 1978). Items were submitted to EFA using principal axis factoring and oblique rotation,
and factors with eigenvalues greater than 1 that passed the scree test were retained. Reliabilities were estimated, and items that loaded on more than one factor (i.e., items with high cross-loadings) or that failed to load above .40 were deleted. This resulted in the identification of six factors (with average reliability of .72) composed of 20 items. Once items for constructs were established, we considered how best to specify them as indicators for the model constructs. That is, items could individually indicate constructs, or they could be collapsed into a scale and used as a scale indicator. Either of these procedures is common in structural equations modeling (see Hon & Kinicki, 2001). Although most model constructs were represented by multiple individual items, the items representing desire to respond were aggregated into scales in order to more fully cover the construct domain (Bollen, 1989), and a single item best represented the intended response construct.

**Measures**

EFA resulted in a limited number of indicators for latent constructs. This enabled us to maximize model parsimony and avoid model identification problems based on sample size. Bentler (1990) recommends a minimum of five cases for each estimated parameter in structural models and the relative austerity of our measures helped us satisfy this recommendation. Nonetheless, the measures used closely correspond with the conceptual constructs delineated in Ilgen et al.’s (1979) model.

*Feedback-rich environment.* Ilgen et al. (1979) included feedback frequency and quantity as important dimensions of the feedback stimulus. They further noted that the specificity of feedback information allows the recipient to convert or transform the feedback message to units that are meaningful to them (p. 351). On the basis of these descriptions, the feedback-rich environment construct was assessed using three separate single-item indicators: feedback frequency, feedback specificity, and feedback sign. Feedback frequency was measured by asking respondents, “How often does your supervisor tell you how you are doing overall?” Responses ranged from 1 (never) to 5 (very often). Feedback specificity was assessed by asking respondents to consider feedback they received about their past year’s performance and indicate, “How specific was the feedback?” Responses ranged from 1 (got no feedback) to 5 (feedback was very specific). Finally, feedback sign was measured by asking respondents to consider the proportion of positive to negative feedback they received. Responses ranged from 1 (100% positive) to 11 (100% negative) and were reverse scored such that high scores reflected positive feedback.

*Source credibility.* Ilgen et al. (1979) noted that supervisors and managers who are perceived as trustworthy and competent serve as important sources of feedback information. We thus used four separate Likert-type items that were modified from Vandaveer’s (1982) source credibility scale to indicate the source credibility of each employees’ supervisor or manager. Respondents indicated their level of agreement with statements including, “I can trust what my supervisor says” and “My supervisor is a real authority. (p. 361) Respondents were asked whether their work gives them a sense of accomplishment, is valuable, and if they are really doing something worthwhile in their job. Responses on these items ranged from 1 (strongly agree) to 5 (strongly agree) and were recoded. Finally, the perceived capability score composed two items: “My assigned tasks are too difficult for me to do” and “I can’t do a good job with my present skills and abilities.” Items were reverse scored prior to aggregation, and responses ranged from 1 (never) to 7 (always).

*Intended response.* This construct was measured with a single item regarding intended effort. Specifically, respondents indicated their level of agreement with the statement, “Because of my most recent performance appraisal session, I intend to put forth a great deal of additional effort towards doing my job.” Responses ranged from 1 (strongly disagree) to 5 (strongly agree). Because the intended response construct was assessed using a single indicator, we corrected for measurement error using the formula provided by Williams and Hazer (1986). Specifically, the square root of the reliability estimate of the indicator (estimated at .90) was used to fix the measurement parameter. This procedure is common in covariance structure analysis (e.g., Farkas & Tetrick, 1989; Prassia & Kinicki, 1996; Wayne & Ferris, 1990), and resulting parameter estimates are accurate and unbiased (see Netemeyer, Johnston, & Burton, 1990).

*Performance.* The ultimate criterion construct, employee performance, was indicated with a single indicator taken from the employee’s performance appraisal. The summary performance rating posted in each employee’s human resource file was used as the performance measure. The company used a 5-point global rating scale with the following anchors: 1 = results did not meet job requirements. Must improve to be acceptable; 2 = results met job requirements; 3 = results occasionally exceeded job requirements; 4 = results consistently exceeded job requirements; 5 = results far exceeded job requirements. This measure was obtained approximately 11 months following the initial survey administration, at the end of the performance review cycle.

*Covariance Structure Analyses*

Covariance structure analysis was used to confirm measures derived from EFAs and to examine construct relationships. This method of analysis permits a powerful test of the causal relations specified in the model (Bagozzi, 1980). The simultaneous analysis of the hypothesized relations leads to more accurate estimates of construct relationships, and the use of multiple indicators avoids bias associated with single-indicator models (Bollen, 1989).

Bentler’s (1995) EQS program was used to evaluate the proposed model. All models were examined using the elliptical estimation procedure within EQS because it allows parameter estimation for data that are not multivariate normal: Mardia’s coefficient revealed that our data violated this assumption. Overall model fit was assessed by three fit indices: the comparative fit index (CFI; Bentler, 1990), the incremental fit index (IFI;
Bollen, 1989), and the nonnormed fit index (NNFI; Bentler & Bonett, 1980). The CFI and NNFI are resistant to errors associated with sample size and the IFI displays less sampling variability than the chi-square-to-
degrees-of-freedom ratio. In addition to the fit indexes, the root-mean-
square error of approximation (RMSEA) assessed lack of model fit (Browne & Cudeck, 1992). The RMSEA is sensitive to model parsimony, and values of .05 or less indicate close fit, whereas values of .08 or less indicate a reasonable error of approximation in relation to the degrees of freedom in the model (Browne & Cudeck, 1992). The CFI difference
between two nested models and the sequential chi-square difference test
(SCDT; James, Mulaik, & Brett, 1982) were interpreted to evaluate meas-
urement model comparisons. An insignificant SCDT suggests acceptance of
the more parsimonious of the nested models. Alternatively, a significant
value indicates acceptance of the less constrained model.

Following Anderson and Gerbing’s (1988) recommendation, covariance
structure analyses were used both for measurement and structural assess-
ment. First, a latent variable baseline measurement model was fitted to the
data. This model was subsequently contrasted to several measurement models
each of which presumed two (or more) of the latent constructs were
alike. The baseline model was contrasted first to a single-factor measure-
ment model to test overall discriminance (Baggozi & Phillips, 1982). Next,
the theoretical independence of the constructs that make up the “cognitive chain” was examined because the uniqueness of these constructs has not been empirically established in the literature. Therefore, we exam-
ined the theoretical independence of constructs representing perceived
accuracy, desire to respond, and intended response.

The test of construct independence, or discriminant validity, consisted of
comparing the baseline measurement model with alternative nested models
hypothesizing equality between two of the cognitive chain constructs. For
example, the baseline model was first contrasted with a model that spec-
ified equality between perceived accuracy and desire to respond. Subse-
quent comparisons contrasted the baseline model to models that con-
stained two other cognitive chain constructs to be equal. Each of the
nested models constrained supposedly independent constructs to be per-
factly correlated and equally correlated with other constructs (Prussia &
Kinicki, 1996).

Model structural linkages were assessed following measurement analy-
eses. Fit indices were used to determine omnibus goodness of fit and overall
model evaluation, and structural path estimates were tested for signifi-
cance. Following baseline model assessment, we evaluated alternative
models by specifying paths between hypothesized constructs. More spe-
cifically, two nested models were compared with the baseline structural
model: a model with a direct path from feedback-rich environment to
desire to respond and a model with a direct path from source credibility to
desire to respond. Support for the alternative models would be given by a
significant chi-square difference relative to the baseline model as well as a
significant path coefficient.

Finally, we examined the degree to which the “cognitive chain” mediates
an individual’s response to feedback. To do this, we followed Baron and
Kenny’s (1986) procedures in which mediation is supported through con-
firmation of three conditions: (a) The independent variables must affect the
mediator; (b) the independent variables must affect the dependent variable;
and (c) the mediator must affect the dependent variable. Before we could
test for mediation it was first necessary to collapse multi-indicator con-
structs and create separate aggregated variables. This resulted in single-
variable composites for each construct in the model. We also aggregated
cognitive chain composites to create an additional “composite mediator”
variable. Previous research on mediation similarly collapsed latent con-
struct indicators in order to derive composite variables (cf. Rogg, Schmidt,

Regression equations were subsequently estimated based on Baron and
Kenny’s (1986) recommendations. First, the composite mediator was sepa-
arately regressed on the two antecedent composites (independent variables)
in order to examine condition one. Next, performance was regressed on the
two antecedent composites in separate equations in order to test condition
two. Finally, performance was regressed on the antecedent composites
control variables, and the composite mediator to evaluate the third condition. To
demonstrate mediation, the mediator must have a greater effect on perfor-
ance than the antecedents, and perfect mediation holds if the antecedent
composites have no effect on performance when the mediator is controlled
(Baron & Kenny, 1986).

Our use of latent variables in structural modeling analyses also allowed us
to avoid potential measurement errors associated with the regression
analyses. Baron and Kenny (1986) noted that measurement error in the
mediator is a main source of bias in mediation regression analyses. They
went on to say, however, that latent variable structural models incorporate
measurement error terms directly into the model thereby controlling for
errors associated with unreliability.

Results

Measurement Model Results

Correlations among construct indicators are given in Table 1. Initial confirmatory factor analysis results supported the conver-
gent validity of all the construct indicators except perceived capa-
bility as an indicator of desire to respond. This indicator was
deleted from subsequent measurement models. Results shown in
Table 2 indicate that the revised baseline measurement model
accurately reproduced the observed covariance matrix, $\chi^2(93, N =
102) = 121.58, p < .05$; CFI = .98; IFI = .98; NNFI = .97;
RMSEA = .05. Furthermore, results shown in Figure 2 reveal that
all standardized factor loadings were significant ($M = .74$). Com-
posite construct reliability, an assessment of the internal consis-
tency of a latent variable, ranged from .63 (desire to respond)
to .89 (perceived accuracy) and averaged .76 (Fornell & Larcker,
1981; Netemeyer et al., 1990). These results attest to the conver-
gent validity of the construct indicators.

In contrast to the six-factor model, the single-factor model used to
assess overall discriminance (Model 2 in Table 2) poorly
accounted for the sample data. More specifically, specifying per-
fet correlation among all model constructs significantly reduced
model fit, $\chi^2(108, N = 102) = 996.63, p < .05$; CFI = .33; IFI =
.34; NNFI = .26; RMSEA = .28. These findings provided support for
the theoretical independence and discriminant validity of the
proposed constructs.

The nested measurement model comparisons entailed examin-
ing the discriminant validity of the constructs within the proposed
cognitive chain. Results indicated that equating cognitive chain
constructs to be equivalent resulted in significantly poorer fitting
models. Both constrained models resulted in significant sequential
chi-square differences as well as decreases in model CFI relative to
the baseline model. Furthermore, increases in RMSEA from the
baseline model suggest greater lack of fit for the nested models
(see Table 2). As a result, all structural model tests were based on
the original six-factor model structure.

Structural Model Results

Structural model results revealed that the baseline latent variable
model (Model 1 in Table 3) generally fit the sample data well:
$\chi^2(101, N = 102) = 179.13, p < .05$; CFI = .94; IFI = .94;
NNFI = .93; RMSEA = .08. The CFI and IFI surpassed the .90
criterion and the RMSEA suggests reasonable error in model
approximation. Furthermore, all model paths yielded significant

parameter estimates. Together, these results provide support for the proposed model and Hypotheses 1–5. In addition, alternative model tests demonstrated that only the model with the added path from source credibility to desire to respond resulted in an improved fit relative to the baseline model (see Table 3). Moreover, the added path was significant and in the predicted direction, thereby supporting Hypothesis 7. This model represented the best fitting model; model parameters are depicted in Figure 3.

Figure 3 reveals that both exogenous antecedents were significantly related to the perceived accuracy construct. As predicted, a feedback-rich environment (.47, \( p < .05 \)) as well as a credible source of feedback information (.41, \( p < .05 \)) were related to the accuracy with which feedback was perceived. Credibility of the source also positively affected the desire to respond (.46, \( p < .05 \)). Results given in Figure 3 further show that the cognitive constructs were significantly related in a sequential chain. More specifically, perceived accuracy was related to the desire to respond (.43, \( p < .05 \)), which consequently led to the intent to respond to feedback (.58, \( p < .05 \)). Intended response then influenced the ultimate response criterion, performance (.24, \( p < .05 \)).

The final analyses demonstrated the extent to which the cognitive chain constructs mediated the relationship between the receipt and response to feedback. Regression results provided evidence regarding mediation (see Table 4). All equations were significant, and coefficients demonstrated satisfaction of the three conditions for mediation. The first condition was satisfied in that both antecedent composites significantly predicted the mediator composite. Next, both antecedent composites significantly affected performance thereby satisfying condition two. Finally, the mediator composite significantly predicted performance over and above the antecedent composites thus indicating satisfaction of condition three. The insignificant antecedent coefficients in the final equation suggest the cognitive chain composite completely mediates the influence of feedback antecedents on subsequent performance. All told, we found strong support for the proposed model as well as the mediating properties of the cognitive chain.

Discussion

The present study used Ilgen et al.'s (1979) feedback process model as a theoretical framework for generating hypotheses regarding employees' response toward performance feedback and to determine whether a sequential chain of cognitive variables mediates an individual's response to performance feedback. Until this test, the mediating role of cognitions within the feedback process had not been substantiated. The first phase of the current analysis examined the operational measures used to assess our proposed feedback constructs. We also examined the veracity of using an overall construct (i.e., feedback-rich environment) to represent a combination of various feedback characteristics. Although past research assumed the validity of different feedback measures, our confirmatory factor analysis provided a direct test of this assumption.

Findings completely support the convergent validity of our measures and the discriminant validity of new measures developed to assess the cognitive variables of perceived accuracy, desire to respond to feedback, and intention to respond to feedback. Results also support a gestalt construct of feedback characteristics comprised of the specificity, frequency, and sign of feedback. This
finding confirms Larson and colleagues’ (Larson, 1984; Larson et al., 1986) contention that many feedback characteristics are highly related and that it makes more sense to examine the overall quality of managers’ performance feedback as opposed to separately focusing on individual feedback characteristics.

The second phase of the analysis longitudinally examined alternative structural representations of a model derived from Ilgen et al.’s (1979) feedback process model. Covariance structure analysis provides support for the constellation of relationships underlying the baseline structural model shown in Figure 1. The CFI of .94 reveals that our model accurately reproduced the observed covariances. This is an important finding because it constitutes the first complete test of the premise that individuals go through a sequential process of cognitively evaluating performance feedback before responding to it. In turn, this result supports theoretical propositions derived from models by Fedor (1991) and Kluger and DeNisi (1996) and has practical implications for how managers might provide more effective feedback and how organizations might design performance appraisal processes. The managerial implications of our results are summarized in a later section.

**Structural Hypotheses Tests**

All structural hypotheses were supported and are discussed in order below. In support of Hypothesis 1, a feedback-rich environment is positively related to the perceived accuracy of feedback. Recipients perceived feedback as being more accurate when it was characterized as specific, frequent, and positive. Consistent with past research (e.g., Albright & Levy, 1995; Stone et al., 1984) and Hypothesis 2, source credibility also is positively associated with the perceived accuracy of feedback. Employees perceived that their feedback was more accurate when it came from trustworthy and competent managers. These results support the conclusion that it is important for managers to provide feedback in such a way that promotes the perception of accuracy because perceived accuracy is the first cognitive variable within the cognitive chain found to mediate employees’ response toward feedback. The belief that feedback is inaccurate is likely to engender behavioral responses that are contrary to those desired by the source of feedback (Atwater & Yammarino, 1997; M. S. Taylor et al., 1984).

Future research is needed to uncover additional predictors of perceived accuracy beyond a feedback-rich environment and source credibility. For example, it is plausible that high levels of perceived accuracy are a function of (a) the extent to which managers and direct reports have similar performance expectations or (b) the validity and/or quality of metrics used to assess performance. Without a valid performance appraisal system, it is difficult, if not impossible, to accurately evaluate performance. Future research is needed to determine the impact of performance expectation gaps and the validity and/or quality of an appraisal system on employees’ perception that they receive accurate feedback about their performance.

Hypothesis 3 is supported by the positive relationship between perceived accuracy and the desire to respond to feedback. Support for Hypothesis 3 suggests that the motivational effects of feedback begin with a perception of feedback accuracy. Furthermore, this finding supports Korman’s (1970) self-consistency theory and reinforces the notion that employees are more likely to respond to feedback when it is consistent with their self impressions. Given that employees tend to have positive rather than negative self perceptions (S. E. Taylor & Brown, 1994), this result underscores the likelihood of employee resistance to attitudinal or behavioral change following the receipt of negative feedback. This conclusion reinforces the need for future research to identify predictors of employees’ acceptance of negative feedback. The justice literature, for instance, provides one plausible theoretical avenue to pursue. It is possible that perceptions of justice influence both perceived accuracy and the desire to respond to feedback. Employees are more likely to perceive feedback accurately and desire to respond to feedback when it is derived from a procedurally just system (i.e., an accurate performance appraisal system). Further, interactional justice may fuel an employee’s desire to respond to feedback because fair interpersonal treatment necessitates that managers communicate truthfully and treat people with courtesy and respect (Colquitt, Conlon, Wesson, Porter, & Ng, 2001). Future research is clearly needed to examine the extent to which perceptions of organizational justice influence the feedback process.

As predicted in Hypothesis 4, the desire to respond to feedback is positively related to employees’ intentions to respond to feedback. This finding reinforces the role of motivation within the feedback process. As discussed by Ilgen et al. (1979), the desire to respond to feedback is enhanced by employees’ perceptions regarding the instrumentality of attitudinal or behavioral change following feedback and the receipt of valued rewards. The current results suggest that employees are more likely to create positive

---

**Table 2**  
**Indices for Nested Sequence of Measurement Models**

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>CFI</th>
<th>IFI</th>
<th>NNFI</th>
<th>RMSEA</th>
<th>$\Delta \chi^2(6)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Baseline measurement model</td>
<td>121.58</td>
<td>93</td>
<td>.98</td>
<td>.98</td>
<td>.97</td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td>2. Single-factor model</td>
<td>996.63</td>
<td>108</td>
<td>.33</td>
<td>.34</td>
<td>.26</td>
<td>.28</td>
<td></td>
</tr>
<tr>
<td>3. Equate perceived accuracy with desire to respond Difference between Models 3 and 1</td>
<td>138.37</td>
<td>98</td>
<td>.97</td>
<td>.97</td>
<td>.96</td>
<td>.06</td>
<td>16.79*</td>
</tr>
<tr>
<td>4. Equate perceived accuracy with intended response Difference between Models 4 and 1</td>
<td>540.74</td>
<td>98</td>
<td>.67</td>
<td>.67</td>
<td>.59</td>
<td>.21</td>
<td>419.26*</td>
</tr>
<tr>
<td>5. Equate desire to respond with intended response Difference between Models 5 and 1</td>
<td>148.25</td>
<td>98</td>
<td>.98</td>
<td>.98</td>
<td>.97</td>
<td>.07</td>
<td>26.67*</td>
</tr>
</tbody>
</table>

*Note. $N = 102$. CFI = comparative fit index; IFI = incremental fit index; NNFI = nonnormed fit index; RMSEA = root-mean-square error of approximation.  
* $p < .05$.  

---
intentions about responding to feedback when they are motivated to respond to feedback.

Hypothesis 5 is confirmed by the positive relationship between the intent to respond to feedback and employee performance measured 11 months later. This finding supports the theory of reasoned action (Fishbein & Ajzen, 1975) as well as the theory of planned behavior (Ajzen, 1991). Moreover, this finding corroborates the longstanding belief that intentions are effective predictors of behavior (Steel & Ovalle, 1984) and reinforces the notion that managers can affect an employee's response to feedback by positively influencing the cognitive constructs preceding the intention to respond to feedback.

In addition to main model analyses, we examined two alternative structural models to Ilgen et al.'s (1979) basic formulation. For the first alternative model we found no support for the prediction that a feedback-rich environment has a direct effect on the desire to respond to feedback (i.e., Hypothesis 6). Rather, a feedback-rich environment indirectly influences the desire to respond through perceived accuracy. In contrast, results derived from the second alternative model support a direct positive relationship between source credibility and the desire to respond—Hypothesis 7. This finding reveals that employees are more likely to positively respond to feedback given by a trusted and knowledgeable supervisor or manager. This may be due to the

![Measurement model results. Standardized factor loadings are presented, all statistically significant.](image)
motivational mechanisms underlying desire to respond. Perhaps feedback from a trusted supervisor strengthens the performance–reward contingency, and feedback from a knowledgeable supervisor is viewed as developmental, thus promoting perceptions of self-competence for the employee. In any case, the fact that source credibility has both direct and indirect effects on the desire to respond to feedback underscores the importance of this construct in the feedback process. Managers are encouraged to enhance their source credibility when trying to foster positive employee responses to performance feedback.

Finally, results support Hypothesis 8 and validate Ilgen et al.’s (1979) critical proposition that an individual’s response to performance feedback is mediated by a set of cognitive variables. This is an important finding because it reinforces the untested idea that divergent responses to feedback are due to a set of intermediate psychological or cognitive processes triggered by feedback. This result also has important managerial implications, which are discussed in the next section. Given that this is the first study to thoroughly examine the cognitive processes associated with an employee’s response to feedback, we concur with Fedor’s (1991) call for more research into the process by which employees perceive and react to feedback.

**Managerial Implications**

There are three key implications derived from our results. The first involves the manner in which managers provide feedback to their direct reports. The current results reveal that an employee’s response to feedback (i.e., performance) is more contingent upon the cognitive processing of feedback than the characteristics of the feedback itself (i.e., specificity, frequency, and sign). This suggests that managers need to consider how their delivery of feedback impacts the perceived accuracy of the feedback. For example, even though positive feedback is more likely to be perceived accurately and accepted than negative feedback (Brett & Atwater, 2001), managers cannot avoid the fact that they must also provide

---

**Table 3**

*Fit Indices for Nested Sequence of Structural Models*

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>$df$</th>
<th>CFI</th>
<th>IFI</th>
<th>NNFI</th>
<th>RMSEA</th>
<th>$\Delta\chi^2(1)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Baseline structural model</td>
<td>179.13</td>
<td>101</td>
<td>.94</td>
<td>.94</td>
<td>.93</td>
<td>.08</td>
<td></td>
</tr>
<tr>
<td>2. Add path from feedback-rich environment to desire to respond</td>
<td>176.69</td>
<td>100</td>
<td>.94</td>
<td>.94</td>
<td>.93</td>
<td>.08</td>
<td>2.44</td>
</tr>
<tr>
<td>Difference between Models 2 and 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Add path from source credibility to desire to respond</td>
<td>169.75</td>
<td>100</td>
<td>.95</td>
<td>.95</td>
<td>.94</td>
<td>.08</td>
<td>9.38*</td>
</tr>
<tr>
<td>Difference between Models 3 and 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. $N = 102$. CFI = comparative fit index; IFI = incremental fit index; NNFI = nonnormed fit index; RMSEA = root-mean-square error of approximation.

* $p < .05.$
negative or constructive feedback. Although there are many potential antecedents of perceived accuracy (see Atwater & Yammarino, 1997), we believe that Antonakis and House’s (2002) description of instrumental leader behaviors are essential for improving the perceived accuracy, desire to respond, and intention to respond to feedback. These behaviors encompass path–goal facilitation and outcome monitoring and specifically relate to the creation of specific performance expectations and/or goals and the observing and rewarding of performance throughout the performance review cycle. It is unlikely that employees will accurately perceive, have a desire to respond to, or intend to respond to feedback without instrumental leadership.

The second implication revolves around a manager’s credibility as a source of feedback. Our results show that source credibility has both direct and indirect effects on employees’ desire to respond to feedback. These findings reveal that employees are more likely to perceive feedback accurately and are more likely to desire to respond to performance feedback when employees trust the source of the feedback and when the source is knowledgeable about employees’ jobs. Managers should not discount the possibility that their source credibility impacts an employee’s resistance to attitudinal and behavioral change following feedback. Managers can improve the feedback process by developing or enhancing their credibility as a feedback source.

The third implication pertains to the design of appraisal systems. As previously discussed, employees are unlikely to accept, desire to respond, or intend to respond to feedback based on information derived from an invalid or inaccurate appraisal system. Organizations and managers thus are encouraged to spend the time and resources needed to improve the accuracy of their appraisal systems. Jelley and Goffin’s (2001) results suggest that such efforts can lead to positive results. Their experiment showed that a priming manipulation based on the Relative Percentile Method led to more accurate performance ratings.

Limitations and Conclusions

Despite contributions of the present study, five limitations must be noted. First, results are based on a relatively small sample within the banking industry. Although our use of CFI corrects for the underestimation of model fit found using the normed fit index (Bentler, 1990) when relying on small sample sizes, the current study should be cross-validated in a larger sample. Second, performance was the only criterion variable used in this study. The current results thus cannot be generalized to other behavioral (e.g., absenteeism, turnover, organizational citizenship behavior) or attitudinal (e.g., justice perceptions, job satisfaction) outcomes associated with the feedback process. Future research would benefit by using additional criteria. Third, we did not examine other antecedents of perceived accuracy, desire to respond, and intended response to feedback beyond those presented in Figure 1. Both Ilgen et al. (1979) and Fedor (1991) suggest that individual difference variables (e.g., self-esteem and locus of control) directly influence the manner in which people process performance feedback. Valuable future research might investigate the role of individual differences within the cognitive processing of performance feedback.

The fourth limitation involves the possibility that shared method bias perhaps inflated parameter estimates because all predictors of performance were assessed through self-reports. That said, however, a one-factor measurement model (CFI = .33, IFI = .34, NNFI = .26, RMSEA = .28) fitted worse than our multifactor measurement model (CFI = .98, IFI = .98, NNFI = .97, RMSEA = .05), indicating that a pervasive method factor did not fully account for the observed relationships. Moreover, we avoided overreliance on self-report data by including a measure of employee performance that was derived from actual company records.

The final two limitations involve our measure of performance. First, we used a single-item measure of performance because the organization limited us to this measure of employee performance. Although a multi-item measure of performance is preferred, a single-item global performance rating is not uncommon in the literature (e.g., Erez & Judge, 2001). The use of supervisor-rated performance also reduces common method bias. Second, rather than measuring changes in performance over time, we assessed performance 11 months after the original survey was administered.

### Table 4

**Regression Analyses for Mediation Conditions**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Condition 1</th>
<th>Condition 2</th>
<th>Condition 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β</td>
<td>SE β</td>
<td>β</td>
</tr>
<tr>
<td>Source credibility</td>
<td>.38</td>
<td>.07</td>
<td>.21</td>
</tr>
<tr>
<td>Source credibility</td>
<td>.24</td>
<td>.05</td>
<td>.16</td>
</tr>
<tr>
<td>Feedback-rich environment</td>
<td>.38</td>
<td>.07</td>
<td>.24</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Composite mediator</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β</td>
<td>SE β</td>
</tr>
<tr>
<td>Source credibility</td>
<td>.11</td>
<td>.10</td>
</tr>
<tr>
<td>Feedback-rich environment</td>
<td>.26</td>
<td>.13</td>
</tr>
</tbody>
</table>

*Note. N = 102.

* p < .05.
Without controlling for prior performance, it is plausible that the unmeasured variables problem is partially responsible for our results. The unmeasured variable problem occurs when major or moderate causes of an endogenous variable are excluded from the prediction of this variable (in this case, performance). For example, the performance rating received by our respondents 2 weeks before completing the survey may have influenced our longitudinal measure of performance. The exclusion of such control variables can result in biased parameter estimates (James, 1980) and inaccurate interpretations of results. Although we did not have a supervisory measure of past performance or a measure of ability to use as control variables, we did have a proxy measure that could be used to partially control for past performance.

The proxy consisted of the following item contained in the original survey: “All things considered, how would your supervisor rate your performance for the past year?” We used a 5-point rating scale with the following anchors: 1 = job requirements not met; 2 = minimum job requirements met; 3 = full job requirements met; 4 = full job requirements exceeded; 5 = full job requirements exceeded on a sustained basis. We then added a path from this proxy to performance in the final structural model and compared results with those reported in Figure 3 and Table 3. The resulting insignificant chi-square difference suggested acceptance of our more parsimonious final structural model (Model 3 in Table 3): revised model including proxy, $\chi^2(115, N = 102) = 190.64$, $p < .05$; previously accepted model, $\chi^2(100, N = 102) = 169.75$, $p < .05$; sequential chi-square difference, $\chi^2(15, N = 102) = 20.89$, $p > .05$. It is also important to note that although adding the proxy into the model yielded a significant path coefficient as well as a reduced overall model fit, the relative strength of the hypothesized model paths remained unchanged and significant. These results attest to the robust character of the relationships specified in our final structural model.

In conclusion, results from this research enhance the existing literature in three primary ways. First, results contribute to explicating the cognitive process through which performance feedback influences employee behavior because this study represents the first complete test of the cognitive processes derived from Igen et al.’s (1979) model. Second, results support the reliability and validity of the feedback constructs contained within our model. This is an important contribution because the independence between Igen et al.’s cognitive mediators had never been established. Finally, the current study has practical implications for managers. Results inform managers about how they can provide feedback that is more likely to produce desired changes in employee behavior. Results also encourage managers to focus on enhancing the perceived accuracy of feedback because it is a key mediator that influences the desire and intention to respond to feedback. Ultimately, behavioral change is unlikely to follow the receipt of performance feedback that is not accepted. At a macro level, results also generate insight regarding the design and maintenance of organizationally based feedback systems (e.g., the performance appraisal process).

References


EMPLOYEE RESPONSE TO FEEDBACK


Received March 20, 2003
Revision received November 14, 2003
Accepted December 10, 2003