**The influence of feedback interventions on attention to task-motivation and meta-task processes: An examination of Feedback Intervention Theory**

Written by Jean-Anne Schmidt

Thesis submitted to the Faculty of the Virginia Polytechnic Institute and State University in partial fulfillment of the requirements of the degree of

MASTER OF SCIENCE

IN

PSYCHOLOGY

Approved:

_____

Neil M.A. Hauenstein, Chair

_____ _____

Roseanne J. Foti Robert J. Harvey

November 04, 1998

# The influence of feedback interventions on attention to task-motivation and meta-task processes: An examination of Feedback Intervention Theory

Written by Jean-Anne Schmidt

and submitted to Dr. Neil M. A. Hauenstein,

Dr. Roseanne Foti,

and Dr. Robert J. Harvey

## Abstract

In 1996, Kluger and DeNisi proposed a new theory concerning response to feedback. Their purpose was to demonstrate that Feedback Interventions do not uniformly improve performance, as has been widely assumed, and to explain this variability. Their theory, Feedback Intervention Theory (FIT), argues that feedback interventions alter level of processing and that performance varies depending on level of processing.

It would be difficult to talk about changes in behavior without addressing motivation. Motivation theories address the need or desire that drives a person to act. For example, self-efficacy theory argues that motivation is driven by the need to set and achieve constantly higher goals. Control theory argues that motivation is driven by the need to reduce the discrepancy between a current state of performance and a performance standard. Goal setting theory argues that motivation is driven by the need to achieve goals. However, (FIT) is not a motivation theory. The purpose of FIT is not to explain what motivates people. Regardless of whether motivation is a response to discrepancies or goals, FIT argues that discrepancies (or goals) are organized hierarchically, and feedback determines which level will be salient. Behavior cannot be attributed to discrepancies (or goals) alone because they may be altered by the feedback itself.

According to Kluger and DeNisi (1996), research investigating the influences of performance has focused primarily on motivation (the Behavioristic Law of Effect being an exception). They argue that the influence of feedback has been largely ignored. They cite Ilgen, Fisher, and Taylor's (1979) call for more research attention to the

psychological processes triggered by feedback as evidence of the need for a feedback intervention theory.

The purpose of this study was to test the premise that feedabck intervention cues differentially direct attention to a level of a processing hierarcy proposed by Kluger and DeNisi (1996). The hierarchy consists of task details, task motivation (general task), or meta-task processes (attention to "self"). Feedback designed to initiate different level of processing was manipulated and performance on a typing task was measured. The relationship between the feedback manipulation and performance was analyzed through analysis of covariance and repeated measures analysis of variance. For the analysis of covariance, the assumption of equality of slopes was violated, so data were analyzed through an ATI design. The feedback manipulation was associated with changes in performance, and these changes depended on ability.

A self-report measure was also designed to assess the relationship between feedback and participants' perceived level of processing. Two items assessed task-motivation, but due to low internal consistency, the two items were interpreted separately. Results indicated that participants were aware of the presence/absence of feedback, but they did not report processing that is consistent with FIT. The two items that assessed meta-task processing also demonstrated low internal consistency and were examined separately. Responses to the meta-task items were consistent with FIT.

Kluger and DeNisi (1996) also argue that individual differences may influence the relationship between feedback and level of processing. We investigated the influence of desire for feedback on the relationship. The measure of Desire for Feedback was developed, and factor analysis revealed the intended unidimensional solution and

adequate internal consistency. The moderating effect of Desire for Feedback on performance and level of processing was investigated through regression analysis and was not significant.

Discussion focuses on the limitations of FIT as originally proposed. It is suggested that one limitation of FIT is that it is based on theories of motivation that primarily predict performance improvement (control theory and self-efficacy theory), yet the purpose of FIT is to provide a theory that specifies conditions for performance decline. Recent developments in FIT research that address this issue are discussed. Recommendations for future research in FIT are also discussed.

Table of Contents

# Tables

# Figures

**The influence of feedback interventions on attention to task-motivation and meta-task processes: An examination of Feedback Intervention Theory**

Performance feedback is an organizational control mechanism designed to improve employee performance. Feedback serves two functions, to motivate employees to do better and to communicate information about errors in performance. Ilgen, Fisher, and Taylor (1979) were among the first to illustrate the complexities of the feedback process. Their influential model examines the important role that individuals play in the perception, acceptance, and willingness to respond to the feedback message. They suggest that performance appraisal is just a specific example of a communication system which includes the source, the message, and the recipient. The model illustrates that variability exists in each element of the system, and this leads to variability in the feedback performance relationship.

The introduction of the Ilgen et al. model represents the beginning of a systematic examination of the relationship between feedback and performance. Prior to their model, little attention was given to task characteristics, control groups were seldom included, and the psychological processes triggered by feedback were ignored (Kluger & DeNisi, 1996). It became widely accepted that feedback improves performance, when in fact the effect of feedback on performance is quite inconsistent (Kluger & DeNisi, 1996). Discovering the relationship between feedback and performance is important in terms of applicability to organizations, but the lack of theory behind decisions regarding which variables to include in studies hinders advancement. Kluger and DeNisi recognized the importance of developing a generalizeable feedback intervention theory. The purpose of

this study is to investigate the viability of the theory they propose, Feedback Intervention Theory.

## Introduction to Feedback Intervention Theory

The goal of the model presented by Kluger and DeNisi (1996) is to explain how feedback has a variable influence on performance. Their theory, Feedback Intervention Theory (FIT), is in essence a control theory model, and as such approaches the use of feedback in terms of a self-regulating system. The feedback loop implied in FIT is similar to the negative feedback loop that characterizes control theory models. Consider the following illustration (Figure 1) of a negative feedback loop offered by Carver and Scheier (1982).

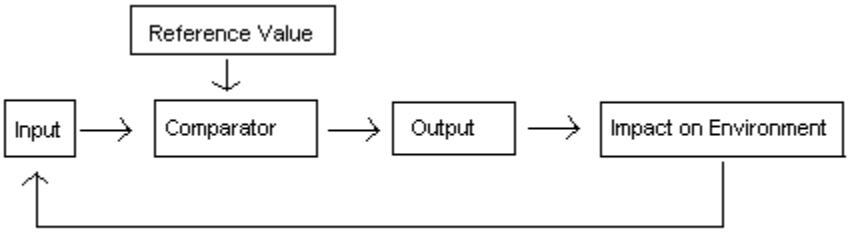


Figure 1. Carver and Scheier's Negative Feedback Loop

According to control theory, the standard or goal is derived from a reference value. Reference values are derived from the individual's implicit categorization of the situation based on previous experience, and these categorizations provide behavior-specifying information (Carver & Scheier, 1982). Individuals use this information to create standards that are organized hierarchically such that at the top of the hierarchy, the individual's ultimate goal is to minimize the discrepancy between behavior and self-

image. The desire to achieve this ultimate goal regulates the goal at the next level, which regulates the goal at the next level and so on.

This concept is best illustrated with an example. Suppose a secretary receives feedback from her boss that her typing speed is below the company's 100 words per minute requirement. The secretary then compares this feedback to her reference value. The secretary's ultimate goal may be to be a hard-worker, and the feedback she has just received from her boss is not consistent with her desired self-image. The ultimate goal of being a hard-worker governs the goal at the next level of the hierarchy, which may be to maintain skills at the highest possible level. This goal governs the goal at the next level, which may be to type faster. This does not imply that the secretary is attending to all of these goals simultaneously. In fact, although attention may shift from level to level, it remains focused on one level at a time. Suppose the secretary realizes her efforts to type faster are not successful. She may consider that she isn't really a hard-worker after all, i.e. her attention shifts up the hierarchy to her ultimate goal.

Carver and Scheier's model can also be applied to Kluger and DeNisi's theory. Feedback acts as the input into the system, and the feedback message is then compared to a standard or goal. Like Carver and Scheier's model, FIT also includes the notion of hierarchically organized goals. However, FIT goes beyond Carver and Scheier's model by specifying the conditions that determine level of processing. According to Kluger and DeNisi, characteristics of the input, i.e. the feedback message, determine which level of the reference value hierarchy is attended to. Then, just as in Carver and Scheier's (1982) model, a comparison is made and a behavioral output is chosen. The last step is to observe the behavior's impact on the environment and seek new input (feedback) to

determine if the discrepancy has been reduced. Thus FIT suggests a slightly altered illustration of the feedback loop (see Figure 2). Notice that except for the placement of the reference value, the two models are identical.

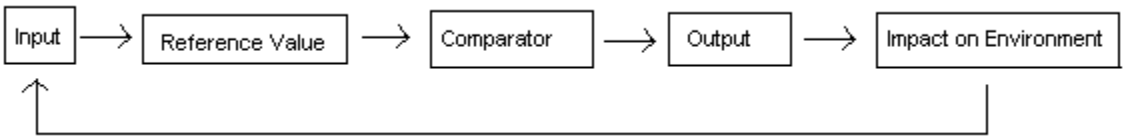


Figure 2. FIT Feedback Loop

Levels of the hierarchy

Kluger and DeNisi (1996) developed FIT based on the following five assumptions p. 259):

1) Behavior is regulated by comparisons of feedback to goals or standards.

2) Goals or standards are organized hierarchically.

3) Attention is limited and therefore only feedback-standard gaps that receive attention actively participate in behavior regulation.

4) Attention is normally directed to a moderate level of the hierarchy.

5) Feedback interventions change the locus of attention and therefore affect behavior. (See Figure 3).

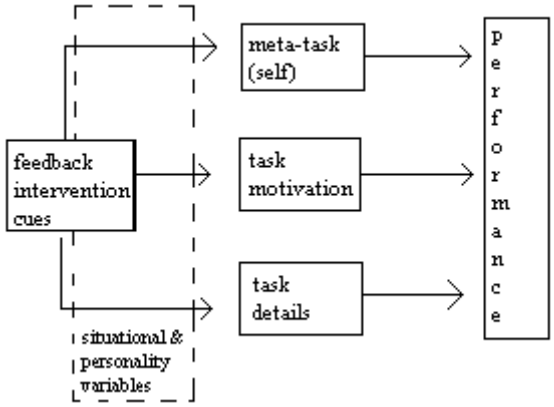


Figure 3. FIT

The first argument is central to most theories of motivation. For example, control theory argues that motivation is a product of the desire to reduce a discrepancy, and goal setting theory argues that motivation is a product of the desire to achieve goals. In order to reduce the discrepancy (achieve goal), people can either change their behavior or change the discrepancy (goal). Like control theory and goal setting theory, self-regulation is a building block of FIT. However, Kluger and DeNisi suggest the notion "that behavior is regulated through feedback-standard comparisons and discrepancy reduction is too simple" (p.261). According to FIT, people process feedback at different levels, and this impacts the salience of the discrepancy or goal. Thus, the real antecedent of behavior is feedback, and as such feedback should be examined separately from discrepancies and goals. In fact, the relationship between feedback interventions and performance must be clearly defined before investigating the influence of additional variables such as goal setting (Kluger & DeNisi, 1996). In order to be included in Kluger and DeNisi's (1996) meta-analysis, studies must have included a group that received feedback that was not confounded with other manipulations. For example, "studies that

compared the effect of goal setting *and* feedback interventions with a control group that received no treatment were excluded" (Kluger & DeNisi, 1996, p. 257). A standard or goal cannot be prescribed in advance because it may be altered by the feedback itself (Avi Kluger, personal communication, March 9, 1998).

The third assumption also addresses this issue. It states that only discrepancies that receive attention can affect behavior. This assumption is consistent with control theory and goal theory, but Kluger and DeNisi allow a broader interpretation of the statement. Their interpretation of this assumption is that feedback interventions command attention. According to FIT, the question is not *if* the feedback intervention will receive attention but rather *at what level* will the intervention be perceived (p.262). This assumption departs from both control theory and goal theory that imply that attention must either be directed toward a discrepancy or a discrepancy (goal) must be set externally. Although creating a discrepancy or setting goals is sufficient to satisfy the third assumption of FIT assumption, it is not necessary. The assumption of FIT is that feedback induces attention to the discrepancy. Moreover, assigned goals or self-set goals are not necessary for the discrepancy to be salient because feedback makes an inherent discrepancy salient.

The last argument is also unique to FIT, and it is this argument that accounts for the inconsistent findings in the feedback performance relationship. According to FIT, feedback interventions have the capacity to direct attention to different levels of a hierarchy, and thereby make people aware of different discrepancies. FIT predicts that the locus of attention will change based on the contents of the feedback (see Figure 3). Kluger and DeNisi suggest that the task-motivation level of the hierarchy is activated

when the feedback message contains *only* discrepancy information: there can be no other cues that will divert attention to a higher or lower level of the hierarchy. FIT predicts that performance improves when attention is directed to the task-motivation level of the hierarchy.

Feedback cues can also activate the lower level of the hierarchy. The task learning level of the hierarchy is activated when feedback cues reflect a feedback standard discrepancy and the message contains information regarding the best strategy for performing a task, i.e. information about task details. This type of feedback benefits performance most when the feedback minimizes the number of trial and error searches for the optimal strategy.

The feedback cue may also activate the upper level of the hierarchy. According to Kluger and DeNisi, any feedback cue that indicates a self-related discrepancy will activate meta-task processes and performance will suffer. Praise, discouraging information, and feedback from another person are all examples of feedback that trigger meta-task processes because each initiates a self-other comparison (Kluger and DeNisi, 1996; Baumeister et. al., 1990).

## Support for FIT

### *Results of Meta-Analysis*

FIT is intended to be a means of explaining the *process* that governs the feedback performance relationship. Feedback has a variable influence on performance because of the process of attending to the cues at different levels of the hierarchy. In their 1996

meta-analysis, Kluger and DeNisi tested the influence of feedback cues on performance, but they were only able to speculate that the cues did indeed direct attention to the supposed level of the hierarchy.

They found support for the idea that the effects of feedback on performance are variable. As expected, feedback containing information about the correct solution, i.e. feedback that should direct attention to the task details level of the hierarchy, does improve performance. Providing feedback after each of several trials allows individuals to gauge their performance and is assumed to direct attention to the task-motivation level of the hierarchy. Consistent with their prediction, this type of feedback is associated with improved performance. They also found that feedback provided by a computer improves performance. This type of feedback is also assumed to direct attention to the task-motivation level because concerns about impression management (a meta-task process) do not emerge as they do when feedback is verbal. Also consistent with their prediction, the effect of verbal feedback on performance was negative, suggesting that this type of intervention directs attention to the meta-task level of the hierarchy. Other types of feedback such as praise and discouraging information are also believed to direct attention to characteristics of the self (eg. Bulter, 1987; Bandura & Cervone, 1986) and also influenced performance in the expected negative direction. These results provide some preliminary support for their model, and this study will further examine the assumptions regarding how attention is directed to different levels of the hierarchy.

Results from *Related Studies*

Results from other research support the hierarchy that Kluger and DeNisi specify. Ilgen and Moore (1987) conducted a study to determine if the influence of feedback on

performance is variable depending on whether feedback was intended to direct behavior or to motivate it. The task in the study was proofreading. The feedback considered to direct behavior concerned whether participants were able to correctly identify spelling errors, and the feedback intended to motivate behavior concerned time spent on the passages of text. Participants were assigned goals along each of these dimensions. Because both quality and time spent on the passages are specific elements of the task, feedback regarding both elements should direct attention to the task detail level of the hierarchy. The dependent variable in their study was performance in terms of both quality and time taken to perform. The results indicate that when feedback specified responses necessary for improved performance, participants improved along the dimension specified. Goal setting theory would predict improved performance on both dimensions because goals were assigned for both dimensions. However, performance improved only on the dimension specified. This study supports the notion that feedback intervention cues that direct attention to task details result in improved performance.

Butler (1987) studied the effect of various types of feedback on interest and performance. She hypothesized that information that focuses attention on task demands promotes interest and improves performance while information that focuses attention on the self promotes ego-involvement, decreased interest, and decreased performance. She gave fifth and sixth graders a divergent thinking task and provided them with either task involving or ego involving feedback. Task involving feedback consisted of specific comments regarding why an individual performed the way he/she did, and ego-involving feedback consisted of grades or praise. Students who received comments expressed the most interest in the task followed by those who received praise followed by those who

received grades only. This demonstrates that *performance* varies depending on which motivational orientation the feedback intervention cues. Performance suffered in both ego involving feedback conditions (grades and praise), but performance only improved in the task involving feedback condition (comments). Self-report measures also indicated that type of feedback influenced effort and success. These results are extremely consistent with the hierarchy proposed by Kluger and DeNisi. In fact Butler concluded that "the results…confirmed that different kind of feedback seem to promote different motivational orientations" (p. 480).

Early, Northcraft, Lee, and Lituchy (1990) conducted a study to determine the impact of process and outcome feedback on the relation of goal setting and performance. Their results are interpretable from a FIT perspective. If outcome feedback indicates a feedback goal discrepancy, then this discrepancy should direct attention to the task-motivation level. Process feedback provides information about how to adjust specific aspects of performance, and this should direct attention to the task details level of the hierarchy. Early et al. predicted that given challenging goals, individuals' task strategy will improve when they are provided with process feedback but not when they are provided with outcome feedback. However, FIT predicts performance will improve in both cases, assuming the goal feedback discrepancy is not too large causing attention to shift to meta-task processes. In fact, results did not support Early et al.'s prediction and are, instead, consistent with FIT. Task strategy improves in both the process and the outcome feedback condition.

A study by Bandura and Cervone (1986) also supports the Kluger and DeNisi model. In their study individuals pursued a standard and then received preselected

feedback. Then the subjects recorded their experience of self-efficacy, self-evaluation, and self-set goals. Self-evaluative reactions to large discrepancies varied considerably when compared to self-evaluation reactions to small discrepancies. When the feedback standard discrepancy was large, self-dissatisfaction increased. As the feedback standard discrepancy narrowed, self-dissatisfaction decreased. Interestingly, the more self-dissatisfied subjects were, the more they increased their effort. When self-efficacy suffered due to substantial or moderate discrepancies, some subjects were undaunted and effort remained high while others experienced self-doubt and effort suffered. This provides some support for the notion that feedback indicating a large discrepancy between the standard and the performance can direct attention to the self and that this can influence performance positively and negatively. According to FIT , when attention to the self has a positive influence on performance, attention has shifted to a lower level of the hierarchy.

Baumeister, Hutton, and Cairns (1990) have found support for the notion that praise is a form of feedback that induces attention to the self and that this is related to declines in performance on skilled tasks. Baumeister et al hypothesized that the decline in performance would occur when participants were engaged in skilled tasks but not effort tasks. This is based on the notion that individuals perform skilled tasks by using automatic scripts, that is not conscious step-by-step processing, and praise interrupts the automatic execution causing performance to suffer. On the other hand, praise improves performance during effort tasks because, unlike skilled tasks, effort alone can lead to improved performance. Participants of their series of experiments played an Atari video game. Participants played the game, and the experimenter provided a difficult goal based

on their scores. After several practice trials, the participants received feedback complimenting their ability to play video games. Baumeister et al. discovered that performance declined following praise. It could be argued that the decline was due to 1) anxiety created by demand to live up to a standard, or 2) participants reduced effort because they felt the praise indicated they had already met the standard, or 3) as Baumeister et al. suggest, the praise caused attention to the self creating interference in automatic scripts.

Baumeister et al. designed further experiments to try to rule out the alternative explanations. They designed two feedback conditions. In one condition, participants received praise regarding their ability to play video games, and in another condition participants received task irrelevant praise regarding their appearance. In the former, there is no "ability-to-play-video-games" standard to live up to, but performance still suffered. In fact, performance suffered in both conditions, and this provides support for the Baumeister et al. interpretation.

However, the performance decrement could still be accounted for by a decline in effort by participants who interpreted the praise as an indication that they had met the standard. Baumeister et al. ruled out this explanation in another experiment in which participants received praise in either a skills task or an effort task. In the effort task, praise led to continued improvement on the task, but in the skills task, praise was related to a decline in performance. Baumeister et al. support Kluger and DeNisi's (1996) evidence of the negative influence of praise on performance. Furthermore, they argue that it is safe to assume that praise generates self-awareness. They state that "praise is a

comparison of the self against standards, and therefore (by definition) it can be assumed to generate a state of self-awareness in the recipient" (p. 132).

Matsui, Okada, and Inoshita (1983) examined how goal progress influences the feedback performance relationship. Subjects were asked to solve 70 arithmetic problems in 10 minutes. After 5 minutes they counted the number complete in order to assess their goal progress. The expectancy of achieving the goal decreases for the low progress group and increases for the high progress group. At the end of another five minute trial, participants counted the number of problems attempted again. Effort was operationalized as the change in number of problems attempted from trial one to trial 2. For high progress subjects, the number of problems attempted remains the same, but for low progress subjects the number of problems attempted increases. These results would support FIT if low progress subjects detected the feedback goal discrepancy and shifted attention to the task details level of the hierarchy in order to take corrective action. The importance of this study in relation to FIT is that performance does in fact vary depending on feedback, and results are consistent with Kluger and DeNisi's predictions. But to fully support the FIT model, the proposed hierarchy must be examined directly.

Clearly, the investigation of feedback on the influence of motivation and performance is not new. It is surprising that Kluger and DeNisi are the first to incorporate the direct influence of feedback on behavior into a feedback theory. Furthermore, support for the existence of the levels of the hierarchy described by Kluger and DeNisi is evident (task details: Early et al., 1990; Ilgen & Moore, 1990; Butler, 1987; task motivation: Early et al., 1990; meta-task: Butler, 1987; Baumeister et al., 1990; Bandura & Cervone, 1986). In their Feedback Intervention Theory, Kluger and DeNisi

specify types of feedback that direct attention to each level of the hierarchy. Theories of motivation are incorporated into FIT as a building block – discrepancies or goals are implied at each level of the hierarchy, but it is feedback that makes them salient.

Feedback Intervention Theory also allows for individual differences to moderate the relationship between feedback and performance. This study explored the influence of desire for feedback on the relationship.

## Desire for Feedback

Recognizing that feedback produces a variable influence on performance is a milestone in feedback research. If feedback has a variable influence on performance, then individuals use feedback differently. However, the individuals' role in accepting and choosing to respond to the message is central. This is consistent with the Kluger and DeNisi model that illustrates that personality variables also influence which level of the hierarchy is attended to. This study will incorporate desire for feedback as a personality variable expected to influence hierarchy level.

Research in the clinical area of psychology has recognized that individuals may differ in their desire to receive feedback (Ruzzene and Noller, 1986; Snyder, Ingram, Handelsman, and Wells, 1982). In an organizational, applied setting, Herold, Parsons, and Rensvold (1996) begin to address the issue by developing a measure of individual differences in feedback propensity. They argue that individuals with an internal propensity prefer feedback generated from the task or from self-evaluation and that individuals with an external propensity value feedback from supervisors and coworkers. Although results did not contradict their notion, they were not completely supportive either. As predicted, the relationship between Internal Propensity (External Propensity)

and preference for feedback from supervisors and coworkers was negative (positive). Individuals with an internal propensity are described as lacking trust in evaluations from others and preferring self-mediated feedback. However, the relationship between Internal Propensity and preference for task and self feedback was not significant. Results indicate that those who score high on the Internal Propensity dimension do not express a preference for self-mediated feedback.

This casts doubt on the existence of the two dimensions as they are specified by Herold et al (1996). Rather than describing individuals as having an "internal" or "external" propensity for feedback, characterizing individuals as "desiring feedback from others" or "not desiring feedback from others" also fits the data. The utility of this measure is also questionable because in an organization where a performance appraisal system has been implemented, feedback would almost certainly come from an external source. With this in mind, rather than examine preference for internal versus external feedback, this study will investigate preference for receiving feedback versus receiving no feedback.

Although feedback is an important resource *for organizations*, it may also be an important resource *for individuals* who are motivated to achieve goals (Ashford & Cummings, 1983). For the individual, feedback can reduce uncertainty regarding not only how they are progressing but also regarding the path that is most likely to lead to the desired outcome. Feedback may serve an important signaling function indicating if the individuals' goals are congruent with the organizations' goals. However, Ashford and Cummings (1983) also add that the "motive to achieve clarity as to how well one is doing with respect to achieving valued goals is not unequivocal" (p. 376). Because of the

human desire for a positive self-image, we may avoid feedback especially if we anticipate that it will be negative. This kind of self-regulation is called self-enhancement.

Brown (1990) also investigated the self-enhancement perspective and compared this perspective with the self-assessment perspective. According to the self-enhancement view of information seeking, people are "guided by a desire to maintain, promote, and defend a positive view of the self" (Brown, 1990, p. 150). The prediction according to this view is inconsistent with the self-assessment position, which states that individuals seek information that will provide them with a realistic self-appraisal regardless of whether it is a positive or negative assessment. Brown (1990) investigated this apparent discrepancy and predicted that the search for information diagnostic of high ability would be greater than the search for information that has potential to indicate low ability. Results indicate that subjects preferred ability diagnostic tasks when they anticipated learning positive information about competence, but even when participants expected negative feedback, they did not completely discontinue information seeking. This indicates that both the self-enhancement and self-assessment regulation processes may operate and supports the notion that individuals will vary along the dimension of desire for feedback.

Swann, Hixon, Stein-Seroussi, and Gilbert (1990) support a slightly different view. They argue that only individuals with a positive self-view seek positive information, and they seek this positive information not because it is self-enhancing but because it is self-verifying. Individuals with a negative self-view seek negative information in order to self-verify. This is different from self-assessment because in self-assessment individuals seek diagnostic information, regardless of whether it is positive or

negative and regardless of their self-view, and in self-verification individuals seek only information that is consistent with their self-view. This is consistent with the notion that individuals vary along the dimension of desire for feedback because if individuals anticipate receiving information that is not consistent with their self-view, they may not desire the diagnostic information. However self-verification is not consistent with the idea that desire for feedback is a stable individual difference because according to Swann et al., self-verification is task specific. Thus individuals with a negative global self-view will still seek positive feedback if they believe their ability to perform the specific task is high.

However, Levy, Albright, Cawley, and Williams (1995) support desire for feedback as a stable characteristic. They examined variables that Ashford and Cummings suggested would influence feedback seeking. They suggested that public self-consciousness and social anxiety predict initial intent to seek feedback while other variables such as impression management impact the conversion of intent to proactive feedback seeking behavior. As expected, those who scored high on public self-consciousness sought more feedback than those who scored low on public self-consciousness. The interaction of public self-consciousness and social anxiety was also significant. As expected, those low in public self-consciousness and high in social anxiety were least likely to seek feedback; however, characteristics of those strongest in feedback seeking intentions were not as predicted. The authors expected high public self-consciousness and low social anxiety to desire feedback the most, but results show that individuals high on both public self-consciousness and social anxiety desire feedback the most. Regardless of these unanticipated results, it is still evident from this study that

desire for feedback is an individual difference. The Levy et al. (1995) study contains further evidence for the existence of this individual difference. The computerized task allowed participants to request or deny feedback, and only 148 of the 192 participants requested feedback.

Another frequently addressed issue in the feedback literature is that receivers may either accept or reject feedback. Research indicates that individuals will seek feedback when they perceive it be useful (Ashford and Cummings, 1983; Fedor, Rensvold, and Adams, 1992). It stands to reason that unsolicited performance evaluations may not be perceived as useful and are therefore undesired. By measuring desire for feedback, this study will examine if undesired information can have a negative influence on performance. This is consistent with Ashford and Cummings (1983) who found that feedback is more likely to have its intended effect when it is "actively sought" than when it is "passively received" (p. 379).

## Present Study

*Levels of the hierarchy*

In their meta-analysis of the feedback literature, Kluger and DeNisi (1996) demonstrated that the effect of feedback on performance is indeed variable. However they were unable to test one of the primary components of their model – that characteristics of feedback cues determine which level of the hierarchy is activated. Based on the kinds of feedback interventions involved in the studies that were included in the meta-analysis, Kluger and DeNisi were only able to speculate how types of feedback differentially activated the hierarchy. By manipulating feedback characteristics, one goal

of this research was to clarify the relationships between feedback characteristics and the propensity to activate the various levels of the FIT hierarchy. The influence of feedback on the task details level of the hierarchy was not investigated in order to keep the scope of the investigation more manageable. Specifically:

The influence of feedback on performance was examined.

**Hypothesis 1**
Feedback including praise or discouraging information leads to performance decrements.

**Hypothesis 2**
Feedback indicating *only* a performance-standard discrepancy increases performance.

The potential for interactions also exists. The performance decrement for participants who received computer feedback in addition to praise is expected to be smaller than for participants who received only praise because the computer feedback will help draw the level of processing to the task-motivation level. Similarly, participants who received praise in addition to computer feedback will demonstrate less improvement than participants who receive only computer feedback.

Secondarily, a self-report measure was developed to examine the influence of attention on level of processing.

**Hypothesis 3**
Feedback indicating *only* a performance-standard discrepancy directs attention to the task-motivation level.

**Hypothesis 4**
Feedback including praise or discouraging information directs attention to the self (meta-task processes).

The potential for interactions also exists. Participants who received praise in addition to computer feedback will demonstrate more meta-task processing than participants who received only computer feedback. Similarly, participants who received computer feedback in addition to praise will demonstrate more task-motivation processing than participants who received only praise because the computer feedback will help draw the level of processing to the task-motivation level.

*Desire for Feedback*

According to Kluger and DeNisi, individual differences also influence which level of the hierarchy receives attention. They propose that "feedback intervention cues that match salient self goals of a given personality type direct attention to meta task processes" (p. 269). Levy et al. (1995) demonstrated that individuals vary along the desire for feedback dimension, and this study examined the role of this individual difference in the hierarchy proposed in FIT. Thus, it was predicted that:

**Hypothesis 5**
Desire for feedback moderates the influence of feedback intervention cues on which level of the hierarchy is activated. Individuals with a high desire for feedback are less likely to focus attention at the self level, resulting in increased performance.

## Method

Overview of Method

This study examined the viability of Feedback Intervention Theory. Specifically, type of feedback was manipulated and the influence of this manipulation on performance

was assessed using analysis of covariance and a time series design. In addition, a measure of Desire for Feedback was developed, and the influence of this individual difference on performance was assessed.

Participants

Participants were 144 undergraduate students enrolled in Psychology courses at Virginia Polytechnic Institute and State University.

Design

This experiment is a 2x3 (task feedback x meta-task feedback) analysis of covariance design with time 1 performance being the covariate. The moderating effect of desire for feedback was tested with hierarchical regression analysis.

Procedure

The study took place in a computer lab with 18 computers. The participants were run in groups of approximately 6. Participants were seated at every third computer so that adequate space between participants would be allowed to insure privacy during verbal feedback from the experimenter. Subjects were told that the purpose of the study was to identify characteristics of an effective manager. During the first part of the study, participants answered an 82 item survey identifying personality characteristics. This served to make the fabricated explanation of the purpose of the study seem more realistic and to disguise the measure of desire for feedback (see Appendix 1) embedded within the survey. Characteristics included in the survey were Locus of Control, Self-Monitoring, Public versus Private Self-Consciousness, Social Anxiety, and Desire for Feedback.

Next, the participants typed the first of a series of excerpts from a pamphlet advocating the dangers of lawn chemicals. The task was computerized. Students typed

words from the pamphlet into a text editor window on a computer, and the program detected words per minute and errors. Participants were told that the computer was tracking words per minute and errors, so they should type as fast and as accurately as possible. Participants clicked on a "Begin" button when they were ready to begin the typing task. They were told that they should not click on this button until they were prepared to type because clicking on this button started the computer's timer. To stress the importance of this, it was indicated that the computer was tracking words per minute and errors. If students clicked on "Begin" before they were ready, they were given instructions on how to start the task over. After typing the first excerpt, participants in feedback conditions were instructed to wait for their feedback. Computer-generated and/or person-mediated feedback were presented simultaneously. After receiving the feedback they began typing the second excerpt. Participants received feedback after the second excerpt and then typed the last excerpt, which was not followed by feedback. Participants in the no feedback condition were instructed that the computer processed words per minute and errors but that they would not receive this information. They were instructed to begin the next trial when the computer indicated to do so. After receiving the feedback intervention and performing the task, participants answered a questionnaire (see Appendix 2) assessing their focus of attention. Finally, Participants were debriefed and dismissed.

Experimental Task

Performance was measured on a typing task. The text of the typing exercise contained information about the dangers of lawn chemicals. A typing task was chosen because of its familiarity to most people. When tasks are familiar, attention is ordinarily

directed toward a moderate level of the hierarchy (Kluger & DeNisi, 1996). However, when tasks are novel, attention may shift to the task learning level of the hierarchy. Kluger and DeNisi (1996) did not find a significant relationship between task performance and task novelty, and a pilot test was conducted to determine if individuals were able to show improvement on this task over multiple trials. Although receiving feedback regarding typing ability is probably novel, it is not related to the familiarity of the task itself.

Independent Variables

Level of Feedback. Two types of feedback, task motivation and meta-task, were given. Each type was intended to activate a different level of the FIT hierarchy. Task Feedback was provided by the computer and contained performance information (words per minute and errors). The use of computer feedback was intended to create the task-motivation condition. Kluger and DeNisi (1996) found a significant, positive effect of computer-generated feedback on performance. There were two levels of this variable: receiving computer feedback and not receiving computer feedback. The computer provided feedback after the first two trials.

Meta-task feedback was operationalized as verbal feedback from the experimenter. There were three levels of this variable: positive feedback from the experimenter (praise), negative feedback from the experimenter (discouraging feedback), and no feedback from the experimenter. Kluger and DeNisi (1996) found a significant, negative effect of verbal feedback, discouraging feedback, and praise feedback. The manipulation incorporated these three feedback characteristics that are believed to direct attention to the meta-task level of the hierarchy. For praise feedback, after trial one the

experimenter stated, “Those scores are pretty high.” After trial two, the experimenter stated, “I have been watching your performance during this task, and I can tell that you are really working hard. Keep up the good work.” For discouraging feedback, after trial one the experimenter stated, “Those scores are a little low.” After trial two, the experimenter stated, “You really aren’t performing as well as I would have expected. Make the best of the next trial.”

Within each meta-task condition, computer feedback may or may not have been present. Regardless of the presence or absence of computer feedback, it was the verbal feedback from the presumed authority that created the meta-task process condition. Also in the meta-task process condition, while providing praise or discouraging feedback, the experimenter ostensibly needed to record their scores after each trial. Verbal feedback is also assumed to initiate meta-task processes because of the salience of the feedback provider (Kluger and DeNisi, 1996).

Time. Performance on the typing task was measured three times, once after each of three trials. Performance at time one represents baseline typing ability and was used as a covariate in the analysis of covariance.

Moderator Variable

Desire for Feedback (appendix 1) was predicted to moderate the relationship between feedback type and level of the FIT hierarchy that is activated. Herold et al. (1996) developed a measure of preference for feedback that is internal to the task versus feedback that is external to the task. However, because in organizations feedback is often external to the task, e.g. from supervisor, the measure developed for this study measured desire for feedback from others. Furthermore, because stable personality characteristics

are related to desire for feedback, (Levy et al., 1995) the measure was stated in global rather than task specific terms.

Dependent Variables

One dependent variable was task performance as measured by words per minute and errors. Errors were detected when a word was misspelled, when there was an extra word, and when there was a missing word. The influence of feedback on performance was assessed at time two and time three. Another dependent variable was the measure of level of hierarchy activation. This was a self-report measure that asked participants to indicate if, during task performance, they were attending to task-motivation or meta-task processes. Two items were written to assess each level of processing measured in this study. Items were written based on the defining characteristics of each level of processing. For example, task-motivation processing is the middle level of processing. Attention at this level is characterized by using feedback to gauge general task performance. Being focused on general performance is the defining feature of task motivation – attention is focused on the general task, rather than task details or self characteristics. The items written to tap these characteristics of task-motivation were *"While engaged in this task, I used feedback to help gauge my performance"* and *"While engaged in this task I was focused on the general task objective"*.

Attention to meta-task processing is characterized by concern for others opinion (impression management), or a focus on self characteristics. Items written to tap these characteristics were *"While engaged in this task, I was concerned for others' opinion of me"* and *"While engaged in this task, my attention was directed inward – I felt aware of characteristics of my self"*. (See appendix 2)

## Results

Pilot

For the purpose of this study, it was important that performance could improve over time. A pilot study was conducted to determine if typing ability was too stable or if it would change over multiple trials. The procedure was the same as previously described. Participants of the pilot study received the no feedback condition. Participants answered the 82 item survey described previously and then completed the computerized typing task. The relationship between performance and the data from the survey was not examined because the purpose of the pilot study was only to determine that performance on the typing task could change. A repeated measures analysis of variance reveals a significant within subjects effect, $F(2, 51) = 8.066$, $p < .01$. Descriptive statistics are presented in Table 1.

Table 1

Descriptive Statistics for Pilot

| | Mean | Standard Deviation |
|---|---|---|
| Words Per Minute (Time 1) | 29.38 | 8.78 |
| Words Per Minute (Time 2) | 30.42 | 8.77 |
| Words Per Minute (Time 3) | 31.27 | 9.21 |

Reliability and Validity of the Measure of Desire for Feedback

This study treats Desire for Feedback as an individual difference. Herold et al. (1996) developed a measure of Desire for Feedback and attempted to establish the position of this personality characteristic in the nomological network. However, they presented the characteristic as a preference for internally versus externally mediated feedback. Because their results did not fully support this conceptualization of Desire for

Feedback, this study explored the possibility of a single bipolar factor (wanting feedback from others versus not wanting feedback from others) by developing a new instrument.

The ten items from the measure of Desire for Feedback were factor analyzed using the Common-Factor method of factor analysis. This method of factor analysis was chosen because prior communalities are estimated rather than set arbitrarily. At issue was whether the measure consisted of one bipolar factor. The scree plot indicated that the measure was unidimensional and the maximum likelihood procedure provided a one factor solution. This factor was labeled Desire for Feedback. Two items had factor loadings of less than .40 and were excluded from further analyses. The remaining items had factor loadings greater than .50 or less than -.50 (see Table 2).

Table 2

Factor Loadings

| Item | Factor Loading |
|---|---|
| Others' evaluation of my performance provides little useful information. | **-.506** |
| I like getting feedback from others concerning my performance. | **.668** |
| Even when I think I have done a good job, I feel a lot more confident of it after someone tells me so. | **.572** |
| I enjoy receiving feedback from others because it helps me improve my performance. | **.817** |
| How others view my performance is not important to me. | **-.622** |
| I do not think I benefit from being evaluated by others | **-.776** |
| *I feel uncomfortable when others suggest areas where I need improvement. | **-.078** |
| *I prefer to assess my performance based on feedback from others. | **.354** |
| It is important for me to know how others evaluate my performance. | **.567** |
| I do not want feedback from others. | **-.745** |

* items excluded from further analysis due to low factor loadings.

The internal consistency was also computed for the Measure of Desire for Feedback. Coefficient alpha after deleting the two bad items was .85, so the use of this measure for further analysis is justified.

Several individual differences that might be related to Desire for Feedback were measured in the 82 item scale that participants answered as the first task in this experiment. These relationships were explored (see Table 3).

Table 3

Correlations of Desire for Feedback with other Measures

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| 1. Locus of Control | 1.00 n=155 | | | | | |
| 2. Self-Monitoring | .093 n=154 | 1.00 n=155 | | | | |
| 3. Private self-consciousness | -.010 n=151 | .325** n=151 | 1.00 n=152 | | | |
| 4. Public self-consciousness | .105 n=154 | .283** n=154 | .450** n=152 | 1.00 n=156 | | |
| 5. Social Anxiety | .251** n=154 | -.188* n=154 | -.094 n=151 | .276** n=154 | 1.00 n=155 | |
| 6. Desire For Feedback | .123 n=153 | .226** n=153 | .184* n=151 | .365** n=154 | .060 n=153 | 1.00 n=155 |

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

The relationship between Desire for Feedback and Locus of Control was not significant, $\underline{r} = .12$, $p > .05$. Herold et al. (1996) indicate that the relationship between feedback propensity and Locus of Control is difficult to define. As they state, it is possible that individuals with an internal locus of control may prefer internally mediated feedback because they see themselves as capable of generating feedback on their own. It is also possible that they would not reject externally mediated feedback if they feel they

control future behavior in response to it. However the measure developed in this study does not contain both internal and external elements. The Desire For Feedback measure in this study is most similar to the External Propensity scale in Herold et al.'s measure, which they argued would demonstrate a positive relationship with Locus of Control.[1] However, neither Herold et al.'s External Propensity measure nor the Desire for Feedback measure designed for this study demonstrated that relationship.

The relationship between Desire for Feedback and Self-Monitoring was significant, $r = .23$, $p < .01$. High self-monitors attend to cues from the environment and make an effort to behave in accordance with those cues. Thus, it is not surprising that self-monitoring was positively related to Desire for Feedback.

In developing their measure of self-consciousness, Fenigstein et al.(1975) found that there are three dimensions to this construct. First is private self-consciousness. People who score high on private self-consciousness tend to direct their attention inward and scrutinize the self. There is no clear relationship between desire for feedback and this dimension. On one hand, private self-consciousness is defined as a tendency to attend to one's "inner thoughts and feelings" (Fenigstein et al., 1996, p. 523) and might be negatively related to desire for feedback. On the other hand, private self-consciousness would be positively related to desire for feedback if feedback is used help to define the self-image. Results indicate a significant, positive relationship ($r = .18$, $p < .05$).

The second dimension of the self-consciousness construct is public self-consciousness. Public self-consciousness is defined as "a general awareness of the self as

[1] Rotter's Locus of Control Scale is keyed in the external direction; thus high scores are associated with external locus of control.

a social object that has an effect on others" (Fenigtein, 1975, p. 523). Thus, public self-consciousness would be positively related to desire for feedback because high public self-consciousness individuals will use feedback to gauge their impact on others (Herold et al., 1996; Levy et al. 1995). The correlation was significant and positive ($r$ = .37, $p$ < .01).

The third dimension of the self-consciousness construct is social anxiety. Given that self-focused attention creates anxiety to those high in social anxiety, it might be expected that there is a negative relationship between social anxiety and desire for feedback. However, no significant relationship was found ($r$ = .06, $p$ > .05).

Herold et al. (1996) recognized the importance of individual characteristics as moderators of the feedback-performance relationship, and they noted the importance of demonstrating convergence, but not redundancy, with related individual differences in order to provide evidence of construct-related validity. Desire for Feedback demonstrates convergence with theoretically relevant individual differences, and no correlations were high enough to indicate redundancy with other measures.

Hypotheses 1 and 2

Hypothesis one concerned whether participants who received computer-generated feedback would improve performance, and hypothesis two concerned whether participants who received person-mediated feedback would demonstrated performance decrements. According to FIT, computer-generated feedback should improve performance because it directs attention to the task-motivation level of processing, and person-mediated feedback should cause performance decrements because it directs

attention to the meta-task level of processing. Students were randomly assigned to conditions; however, one condition contained four participants whose typing skills clearly exceeded the majority. Each of these participants typed 70 or more words per minute. Few others were able to type more than 50 words per minute and most typed in the upper twenties to low thirties. Due to chance, the four participants with advanced typing skills (i.e. greater than 70 words per minute) were assigned to the same condition. Data for these four outliers were omitted from the analysis. Typing at time 1 assessed baseline typing ability because performance at time 1 preceded feedback manipulations. To test for pre-manipulation group differences, a 2 x 3 analysis of variance was conducted for time one for both dependent variables, words per and errors. Results are presented in Table 4. Results indicated non-significant main effects and interactions for both dependent variables.

Table 4

Analysis of Variance summary Table for Measures of Performance at Time 1

| *Dependent variable: Words per minute at time 1* | | | |
|---|---|---|---|
| | Df | Mean Square | F |
| Person | 2 | 16.606 | .326 |
| Computer | 1 | 9.199 | .180 |
| Person x Computer | 2 | 49.248 | .966 |
| Error | 139 | 50.967 | |
| *Dependent variable: Errors at time 1* | | | |
| | Df | Mean Square | F |
| Person | 2 | 62.171 | 1.768 |
| Computer | 1 | 43.565 | 1.239 |
| Person x Computer | 2 | 64.103 | 1.823 |
| Error | 139 | 35.161 | |

A 2x3 analysis of covariance, with time 1 performance as the covariate, was conducted for time 2 and time 3, where group differences were predicted. A closer

examination of the analysis revealed that an assumption of the analysis of covariance was violated (the assumption of equality of slopes), so the data were analyzed using an ATI design. When words per minute at time 1 is the covariate, the slopes of the regression lines are not equal for different levels of the person feedback manipulation when the dependent variable is words per minute at time 3. The person feedback by covariate interaction was not significant when words per minute at time 2 is the dependent variable. The slopes are also different for different levels of the computer feedback manipulation when the dependent variable is words per minute at time 2 and words per minute at time 3 (see Table 5). The patterns of relationships (when the interaction is significant) are illustrated in Figure 4, Figure 5, and Figure 6.

Table 5

Feedback by Covariate Interactions

| **Person Feedback by Covariate Interaction** | | | |
|---|---|---|---|
| Variables in equation | B | $R^2$ | F |
| Dependent variable: Words per minute at time 2 | | | |
| Step 1 – WPM 1 | .887 | | |
| Person Feedback | .52 | .770 | |
| Step 2 – WPM 1 | .888 | | |
| Person Feedback | 1.292 | | |
| Person Feedback X WPM 1 | -.029 | .772 | |
| | | | $\triangle$ F = .61 |
| Dependent variable: Words per minute at time 3 | | | |
| Step 1 – WPM 1 | .889 | | |
| Person Feedback | .223 | .757 | |
| Step 2 – WPM 1 | .891 | | |
| Person Feedback | 2.404 | | |
| Person Feedback X WPM 1 | -.076 | .770 | |
| | | | $\triangle$ F = 3.9* |
| **Computer Feedback by Covariate Interaction** | | | |
| Dependent variable: Words per minute at time 2 | | | |
| Step 1 – WPM 1 | .888 | | |
| Computer Feedback | -.262 | .768 | |
| Step 2 – WPM 1 | .899 | | |
| Computer Feedback | -3.283 | | |
| Computer Feedback X WPM 1 | .104 | .778 | |
| | | | $\triangle$ F = 6.80** |

| | | | |
|---|---|---|---|
| Dependent variable: Words per minute at time 3 | | | |
| Step 1 – WPM 1 | .890 | | |
| Person Feedback | -.194 | .756 | |
| Step 2 – WPM 1 | .901 | | |
| Computer Feedback | -3.24 | | |
| Computer Feedback X WPM 1 | .105 | .767 | |
| | | | $\triangle$ F = 6.70** |
| **Person Feedback by Computer Feedback by Covariate Interaction** | | | |
| Dependent variable: Words per minute at time 2 | | | |
| Step 1 – WPM 1 | .906 | | |
| Person Feedback | 1.949- | | |
| Computer Feedback | 3.136 | | |
| Person X Computer | -1.045 | | |
| Person Feedback X WPM 1 | -.061 | | |
| Computer Feedback X WPM 1 | .104 | .789 | |
| Step 2 – WPM 1 | .908 | | |
| Person Feedback | 1.865 | | |
| Computer Feedback | -3.133 | | |
| Person X Computer | -.466 | | |
| Person Feedback X WPM 1 | -.061 | | |
| Computer Feedback X WPM 1 | .104 | | |
| Person X Computer X WPM1 | .01 | .793 | |
| | | | $\triangle$ F = 1.29 |
| Dependent variable: Words per minute at time 3 | | | |
| Step 1 – WPM 1 | .905 | | |
| Person Feedback | .779 | | |
| Computer Feedback | -3.177 | | |
| Person X Computer | -.493 | | |
| Person Feedback X WPM 1 | -.012 | | |
| Computer Feedback X WPM 1 | .103 | .782 | |
| Step 2 – WPM 1 | .906 | | |
| Person Feedback | .694 | | |
| Computer Feedback | -3.142 | | |
| Person X Computer | .45 | | |
| Person Feedback X WPM 1 | -.011 | | |
| Computer Feedback X WPM 1 | .102 | | |
| Person X Computer X WPM1 | -.034 | .783 | |
| | | | $\triangle$ F = .30 |

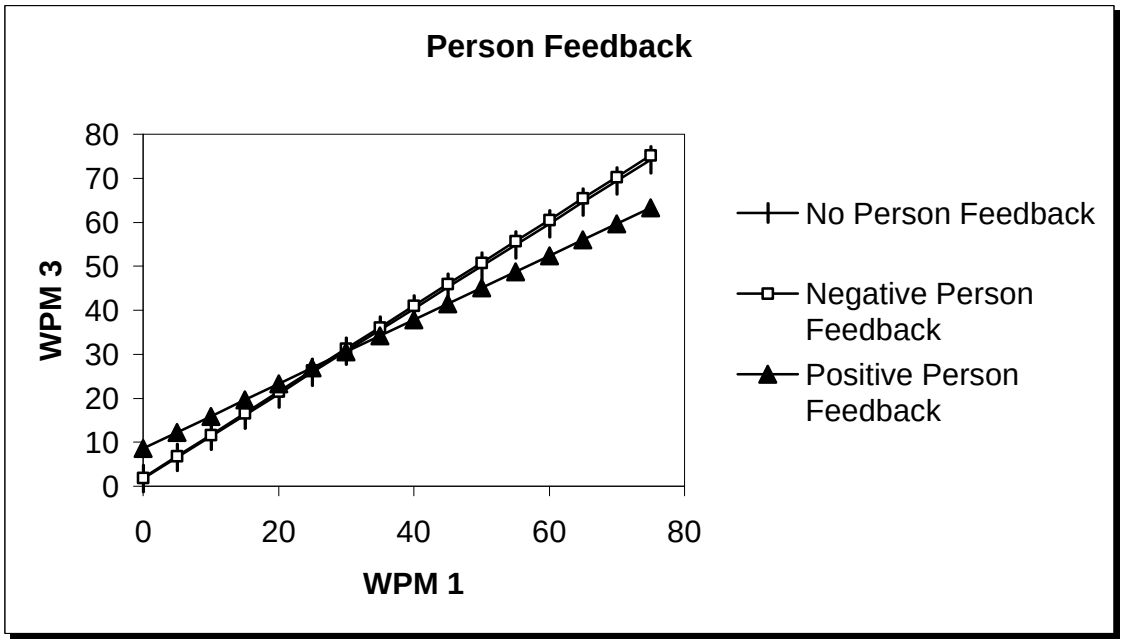


Figure 4 - Person Feedback by Covariate Interaction (when the dependent variable is words per minute at time three).

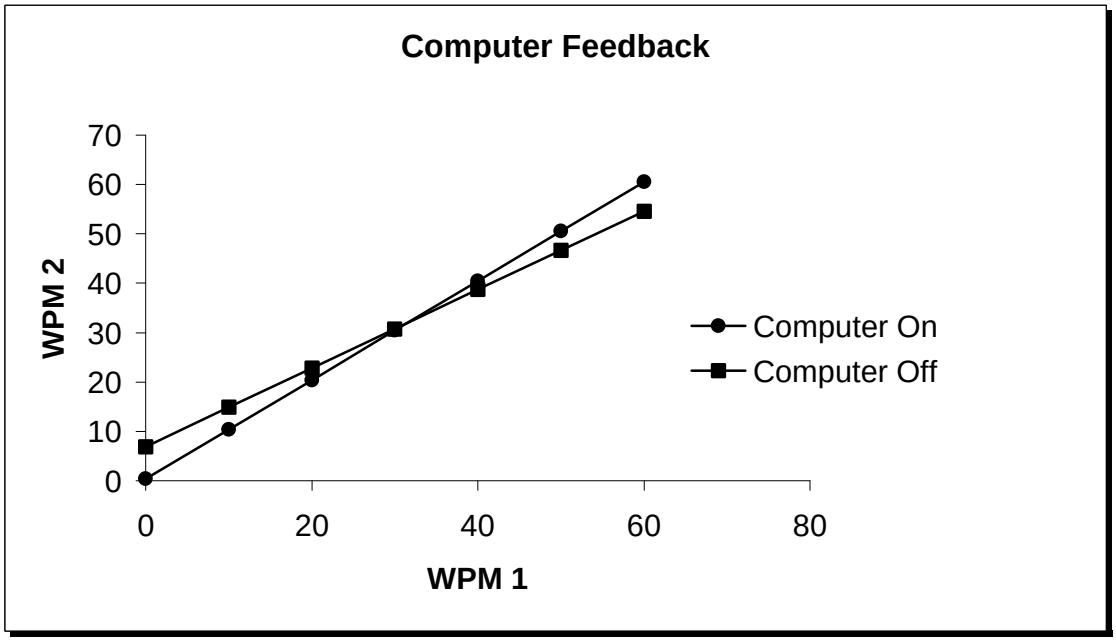


Figure 5 - Computer feedback by Covariate Interaction (when the dependent variable is words per minute at time two).

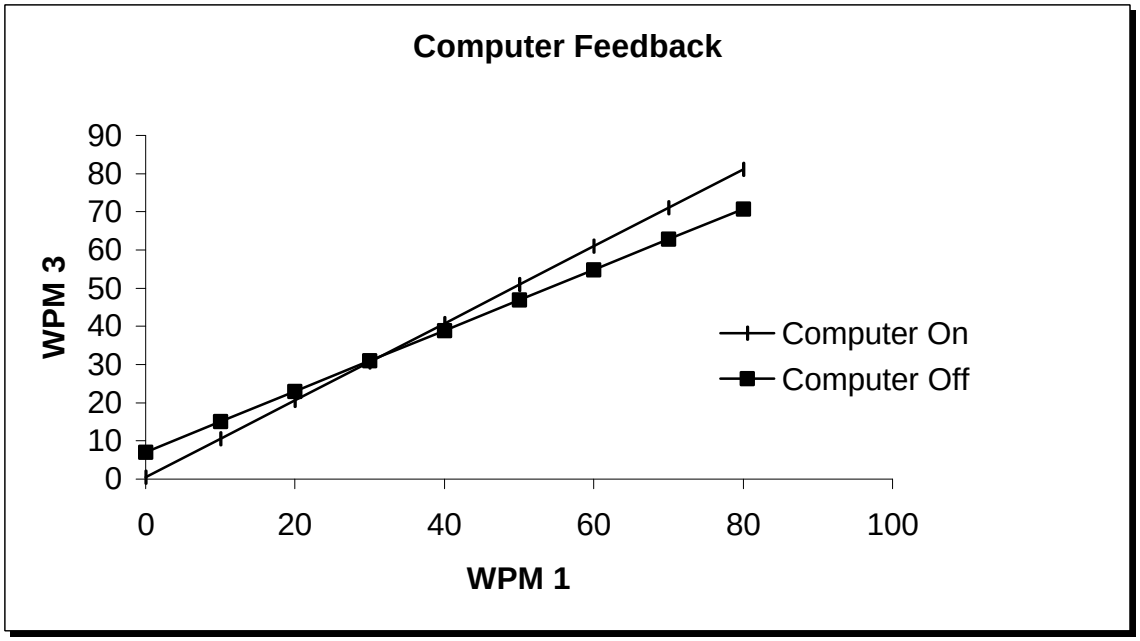


Figure 6 - Computer feedback by Covariate Interaction (when the dependent variable is words per minute at time three).

These results indicate that the influence of the feedback manipulation depends on typing ability. FIT predicts that both negative and positive person-mediated feedback are related to performance decreases. Figure 4 illustrates the person-mediated feedback by covariate interaction, and the pattern of results indicates partial support for this prediction. At high levels of ability, those who receive positive person-mediated feedback do not perform as well as those who do not receive any feedback. Contrary to FIT, there is little difference in performance for those who receive negative person-mediated feedback compared to those who receive no person-medicated feedback. For low ability participants, results are not consistent with FIT in that those who received positive feedback performed the best. The results for low ability participants are more consistent with self-efficacy theory. Lower ability participants may have lower self-

efficacy, and positive feedback may improve self-efficacy and lead to higher aspirations. Higher ability participants may already feel efficacious.

The interaction between computer-generated feedback and the covariate is also partially supportive of FIT. FIT predicts that computer feedback improves performance, and results are consistent with this for those with high ability. However, low ability participants perform better without computer feedback.

In cases where the assumption of equal slopes was not violated, the method remains analysis of covariance, and those results are presented in Table 6.

Table 6

Analysis of Covariance Summary Table for Measures of Performance at Time 2 and Time 3

| *Words per minute at time 2* | | | |
|---|---|---|---|
| | Df | Mean Square | F |
| WPM1 | 1 | 5670.792 | 472.471** |
| Person | 2 | 8.356 | .696 |
| Computer | 1 | 6.883 | .573 |
| Person x computer | 2 | 23.644 | 1.970 |
| Error | 138 | 12.002 | |
| *Errors at time 2* | | | |
| | Df | Mean Square | F |
| Errors1 | 1 | 772.197 | 22.402** |
| Person | 2 | 4.355 | .126 |
| Computer | 1 | 1.126 | .033 |
| Person x computer | 2 | 63.974 | 1.856 |
| Error | 138 | 34.470 | |
| *Errors at time 3* | | | |
| | Df | Mean Square | F-value |
| Errors1 | 1 | 897.849 | 23.559** |
| Person | 2 | 32.528 | .854 |
| Computer | 1 | 37.833 | .993 |
| Person x computer | 2 | 25.481 | .669 |
| Error | 138 | 38.110 | |

**$p < .01$

The main effect at time 2 for computer feedback was not significant when the dependent variable was errors $F$ (1, 138) = .033, $p > .05$. An interaction was also

predicted because task-motivation should be lower when person-mediated feedback is present than when it is not because person-mediated feedback draws attention away from the task. However the interaction was not significant when the dependent variable was errors, $F$ (2, 138) = 1.856, $p > .05$. The 2x3 ancova also revealed non-significant main effects for errors at time 3 $F$ (1, 138) = .993, $p > .05$. The interaction at time 3 was also non-significant for errors $F$ (2, 138) = .669, $p > .05$.

At time 2, the main effect for person feedback when words per minute was the dependent variable was non-significant, $F$ (2, 137) = .696, $p > .05$, and the effect when errors was the dependent variable was also non-significant, $F$(2, 137) = .033 , $p > .05$. At time 3, the main effect for person feedback when errors was the dependent variable was also non-significant, $F$ (2, 138) = .854, $p > .05$. Furthermore, interactions for both dependent variables were also non-significant, as discussed in the results of hypothesis one.

In summary, results of the ATI analysis reveal some support for FIT, but none of the ancova results supports FIT.

We also tested hypotheses 1 and 2 with repeated measures analysis of variance. The main effects for time was significant for words per minute, $F$ (2, 138) = 3.996, $p < .05$, and errors, $F$ (2, 138) = 4.681, $p < .05$. However, the computer feedback by time interaction was not significant for words per minute, $F$ (2, 138) = .222, $p > .05$. The person feedback by time interaction was not significant for words per minute, $F$ (4, 276) = .817, $p > .05$, or for errors $F$ (4, 276) = 1.19, $p > .05$. The three-way interaction (person by computer by time) was also non-significant for words per minute, $F$ (4, 276) = 1.26, $p > .05$, and errors $F$ (4, 276) = 1.436.

Hypothesis 3

Hypothesis three stated that feedback indicating only a performance-standard discrepancy (computer-generated feedback) would direct attention to the task-motivation level. In the "Measure of Level of Hierarchy Receiving Attention" (Appendix 1), students were asked two questions intended to assess task-motivation level attention. The two questions that addressed this level of the hierarchy had low internal consistency ($\alpha$ = .05), and were examined separately. The two items were:

*While engaged in this task, I used feedback to help gauge my performance.*

| Disagree | somewhat disagree | | somewhat agree | agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

*While engaged in this task, I was focused on the general task objective.*

| Disagree | somewhat disagree | | somewhat agree | agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

In retrospect, the first item is not a good indicator of the task-motivation level of processing. It serves more as an indicator of whether participants were aware of the feedback manipulation – participants in any feedback condition (either person or computer) should endorse the item more than participants in the no feedback condition. This suggests that the item should produce a main effect for both types of feedback. The main effect for computer feedback was significant, $F$ (1, 138) = 6.468, $p < .05$, but the main effect for person feedback was not significant, $F$ (2, 138) = 1.541, $p > .05$ (see Table 7). However, Figure 7 illustrates participants who received either computer-generated feedback or person-mediated feedback demonstrated the highest level of endorsement (M = 2.59), and participants who received neither computer-generated feedback nor person-mediated feedback demonstrated the lowest level of endorsement

(M = 1.83). The pattern of results indicated that participants were aware of and used the feedback provided. It is interesting to note that the mean collapsed over the conditions that received feedback is lower than might be expected (2.59), and this seems to be due to lower endorsement of the item for the person feedback variable. Participants may have attended more to computer feedback than to person feedback.

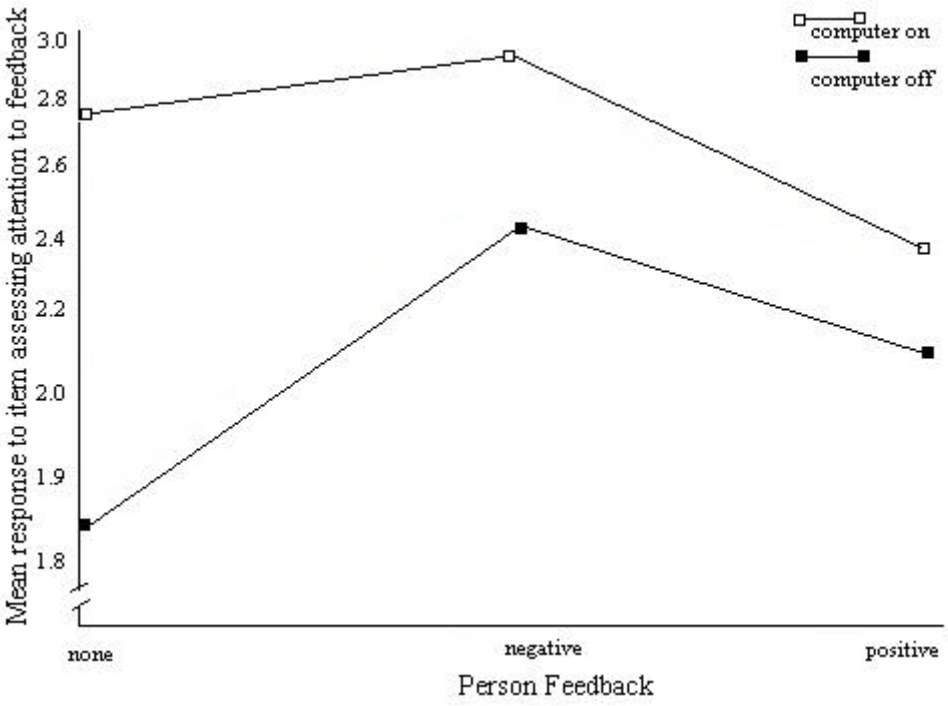


Figure 7. Attention to Feedback Item

The wording of the other task-motivation item was consistent with the level of processing interpretation. FIT predicts a main effect because computer-generated feedback will result in a higher level of task-motivation. However, an interaction is also predicted because task-motivation will be lower when person-mediated feedback is present than when it is not because person-mediated feedback draws attention away from the task. Table 7 presents the results of a 3x2 analysis of variance. The means and

standard deviations for responses as a function of person and computer feedback are presented in Table 8.

The interaction was not significant for the task motivation item, $F$ (2,138) = .214, $p$ > .05. Nonetheless, FIT predicts higher task-motivation when computer-generated feedback is present. The significant main effect for computer feedback was significant, $F$ (1,138) = 5.089, $p$ < .05; however, the effect was not in the predicted direction. That is, subjects who received computer feedback reported significantly lower scores (M = 3.18) on the task-motivation item than those who did not receive computer feedback (M = 3.53) (see Figure 8). Results indicated that type of feedback did not evoke the predicted level of attention, so the third hypothesis was not supported.

Table 7

Analysis of Variance Summary Table for Attention to Feedback and Task-motivation Items

| *Attention to feedback item: While engaged in this task, I used feedback to help gauge my performance.* | | | |
|---|---|---|---|
| | Df | Mean Square | F |
| Person | 2 | 2.402 | 1.541 |
| Computer | 1 | 10.081 | 6.468* |
| Person x Computer | 1 | 1.632 | 1.047 |
| Error | 138 | 1.559 | |
| *Task-motivation item: While engaged in this task, I was focused on the general task objective.* | | | |
| | Df | Mean Square | F |
| Person | 2 | .177 | .211 |
| Computer | 1 | 4.280 | 5.089* |
| Person x Computer | 2 | .180 | .214 |
| Error | 138 | .841 | |

*$p$ < .05

Table 8

Item means (standard deviations)

| | Person-mediated, with Computer feedback on | | | Person-mediated, with no Computer-generated | | |
|---|---|---|---|---|---|---|
| | Off | Negative | Positive | Off | Negative | Positive |
| Attention to feedback item | 2.79 (1.40) | 2.93 ( .96) | 2.48 (1.19) | 1.83 (1.61) | 2.52 (1.21) | 2.24 (1.12) |
| Task-motivation item | 3.21 ( .98) | 3.22 ( .85) | 3.12 (1.39) | 3.65 ( .49) | 3.43 ( .87) | 3.52 ( .69) |
| Meta-task item 1 | .79 ( .92) | 2.22 (1.34) | 1.40 (1.19) | .78 ( .90) | 1.05 (1.16) | 1.14 (1.03) |
| Meta-task item 2 | 2.11 (1.20) | 2.59 (1.05) | 2.17 (1.31) | 1.61 (1.41) | 2.29 (1.05) | 2.31 (1.31) |

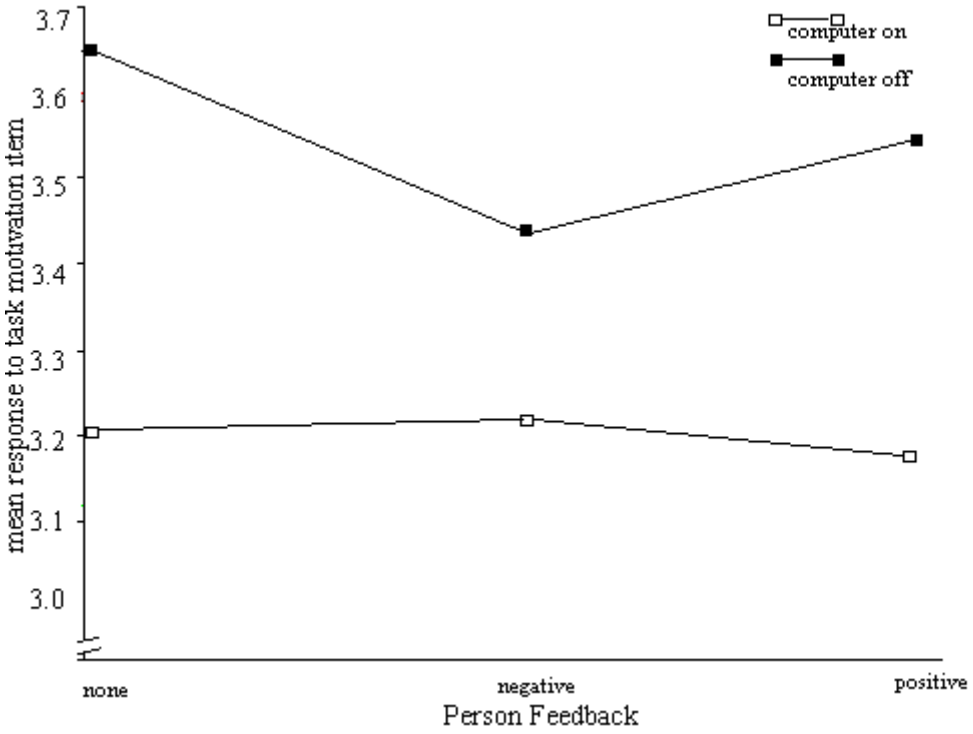


Figure 8. Task-motivation Item

Hypothesis 4

The next hypothesis stated that person-mediated feedback would direct attention to meta-task processes. Two items assessed attention to meta-task processes. The two

items that addressed this level of the hierarchy also demonstrated low internal consistency ($\alpha$ = .35), and were examined separately. The low internal consistency may be due to the fact that the items assessed different aspects of meta-task processing. The first item addressed others' opinion of the individual while the second item addressed the individuals' own opinion. The two questions that addressed meta-task processing were:

*Meta-task item 1: While engaged in this task, concern for others' opinion of me was*

| Not my primary focus | | a moderate focus | | my primary focus |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

*Meta-task item 2: While engaged in the task, my attention was directed inward – I felt aware of characteristics of my "self."*

| Disagree | somewhat disagree | somewhat agree | agree |
|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

According to FIT, participants who received person-mediated feedback should endorse these items; person-mediated feedback initiates meta-task processing regardless of computer feedback.

Table 9 reveals the results of a 3 X 2 analysis of variance for each item addressing meta-task processes. Also see Table 8 for means and standard deviations.

Table 9

Analysis of Variance Summary Table for Meta-Task Processing Items

| *While engaged in this task, concern for others' opinion of me was my primary focus.* | | | |
|---|---|---|---|
| | Df | Mean Square | F |
| Person | 2 | 7.989 | 6.480** |
| Computer | 1 | 8.164 | 6.622* |
| Person x Computer | 1 | 4.331 | 3.513* |
| Error | 138 | 1.233 | |
| **Simple effects** | | | |
| Person (computer on) | 2 | 21.48 | 18.05** |
| Person (computer off) | 2 | 2.49 | 2.09 |
| Within cells | 144 | 1.19 | |
| *While engaged in this task, my attention was directed inward -- I felt aware of characteristics of my "self."* | | | |
| | Df | Mean Square | F |
| Person | 2 | 3.835 | 2.483+ |
| Computer | 1 | 1.694 | 1.097 |
| Person x Computer | 2 | 1.300 | .842 |
| Error | 137 | 1.545 | |

**$p$ < .01 * $p$ < .05 + $p$ < .10

Results indicated that the first meta-task item produced the anticipated significant main effect for person feedback, $F$ (2, 138) = 6.480, $p < .01$. The means for the first item when person feedback was not present, when it was positive and when it was negative were .90, 1.10, and 1.38 (respectively). The main effect for the second meta-task item approached significance, $F$ (2, 137) = 2.483, $p < .10$. The means for the second item when person feedback was not present, when it was positive, and when it was negative were 1.32, 1.30, and 1.09 (respectively).

FIT would also predict an interaction because while person feedback initiates meta-task processing, meta-task processing might be reduced with the addition of objective computer feedback. The interaction was significant for the first meta-task item, $F$ (2, 138) = 3.513, $p < .05$, but the interaction was not significant for the second meta-task item, $F$ (2, 137) = .842, $p > .05$. The significant interaction for the first item indicates that person-mediated feedback behaved differently depending on computer feedback. Results of a simple effects analysis revealed a significant main effect for person feedback when computer feedback was on, $F$ (2,144) = 18.05, $p < .01$, but not when computer feedback was off, $F$ (2,144) = 2.09, $p > .05$ (see

Figure 9). For the first meta-task processing item, the highest level of endorsement was when participants received computer feedback and person feedback was negative. Participants may have weighed person feedback more heavily, particularly negative feedback, when computer feedback was also present to reinforce it. Figure 10 illustrates that the same pattern of results for the second meta-task item. In support of hypothesis 4, the items generally indicated that person feedback evoked meta-task processing.

Figure 9 and Figure 10 illustrate the pattern of responses for the meta-task items.

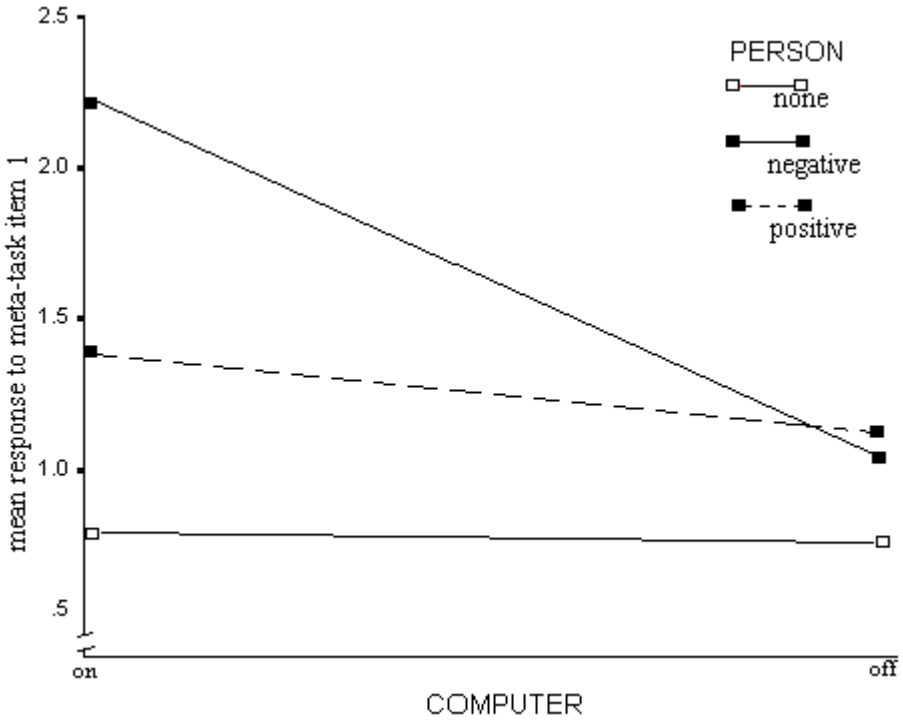


Figure 9. Meta-task item 1

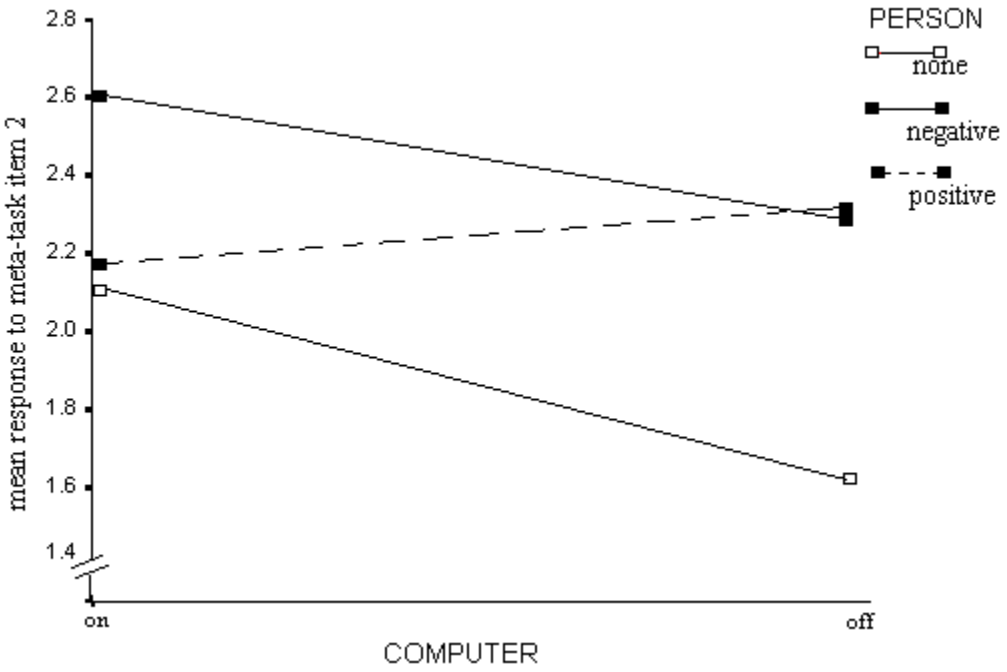


Figure 10 - Meta-task item 2

Hypothesis 5

Hypothesis five contained two parts. The first part of the hypothesis stated that desire for feedback would moderate the influence of feedback on which level of the hierarchy is activated such that the feedback manipulations function differently depending on the individual's desire for feedback. For the item that assessed attention to the task-motivation level, participants who were low in desire for feedback and received either type of feedback were expected to score lower than low desire for feedback participants who did not receive feedback because their attention should be at the meta-task level. Meta-task processes should not be initiated in low desire for feedback participants who do not receive feedback. Participants who were high in desire for feedback were expected to score higher on task-motivation when feedback was present

than when feedback was not present. In general, high desire for feedback participants were expected to score lower than low desire for feedback participants on meta-task processing items. Thus, the two-way interactions, i.e. the interactions between the continuous measure of desire for feedback and each of the feedback manipulations, were expected to be significant.

The significance of the interactions was measured with an F-change test, which measures the significance of the change in $R^2$ between two regression models: one that contained only main effects and one that contained both main effects and interactions. Results are presented in Table 10. For the task-motivation item, an F-change test revealed that the interaction was not significant for person-mediated feedback, $F$ (2, 135) = 0, $p > .05$ or for computer-generated feedback, $F$ (1, 138) = 1.41, $p > .05$.

An ordinal interaction between person-mediated feedback and desire for feedback was expected for items assessing meta-task processing. Low desire for feedback participants and high desire for feedback participants were expected to score similarly on these items when feedback was absent. However, participants low in desire for feedback were expected to attend more to meta-task processes than high desire for feedback participants following the presentation of either computer-generated or person-mediated feedback. Results did not support this prediction. For the first meta-task item, the interaction between desire for feedback and person-mediated feedback was not significant, $F$ (2, 135) = .36, $p > .05$, and the interaction between desire for feedback and computer-generated feedback was also non-significant, $F$ (1, 138) = 0, $p > .05$. For the second meta-task item, the interaction between desire for feedback and person-mediated feedback was not significant, $F$ (2,135) = .49, $p > .05$, and the interaction between desire

for feedback and computer-generated feedback was also non-significant, $F$ (1, 138) = .28, $p > .05$.

Table 10

Summary of Hierarchical Regression Analysis for Level of Processing Variables

| Variables in equation | B | $R^2$ | F |
|---|---|---|---|
| Dependent variable: task motivation item | | | |
| Step 1 – Desire for feedback | -.010 | | |
| Person feedback | .3823 | | |
| Computer feedback | .208 | .107 | |
| Step 2a- Desire for feedback | -.010 | | |
| Person feedback | .568 | | |
| Computer feedback | .208 | | |
| Desire for feedback X person feedback | -.011 | .107 | |
| | | | △ F = 0 |
| Step 2b- Desire for feedback | -.016 | | |
| Person feedback | .377 | | |
| Computer feedback | 1.153 | | |
| Desire for feedback X Computer feedback | -.059 | | |
| | | .116 | |
| | | | △ F = 1.41 |
| Dependent variable: Meta-task item 1 | | | |
| Step 1 – Desire for feedback | -.013 | | |
| Person feedback | -.096 | | |
| Computer feedback | -.173 | .044 | |
| Step 2a- Desire for feedback | -.020 | | |
| Person feedback | -.223 | | |
| Computer feedback | -.168 | | |
| Desire for feedback X person feedback | .007 | .049 | |
| | | | △ F = .36 |
| Step 2b- Desire for feedback | -.013 | | |
| Person feedback | -.096 | | |
| Computer feedback | .209 | | |
| Desire for feedback X computer feedback | .002 | .044 | |
| | | | △ F = 0 |
| Dependent variable: Meta-task item 2 | | | |
| Step 1 – Desire for feedback | -.019 | | |
| Person feedback | .232 | | |
| Computer feedback | .060 | .027 | |
| Step 2a- Desire for feedback | -.011 | | |
| Person feedback | -.168 | | |
| Computer feedback | -.053 | | |
| Desire for feedback X person feedback | .025 | .034 | |
| | | | △ F = .49 |

| | | | |
|---|---|---|---|
| Step 2b- Desire for feedback | -.022 | | |
| Person feedback | .30 | | |
| Computer feedback | .538 | | |
| Desire for feedback X computer feedback | -.030 | .029 | |
| | | | $\wedge$ F = .28 |

Note: The change in $R^2$ from step 1 to step 2a assesses the significance of the Desire for Feedback by Person Feedback interaction. The change in $R^2$ from step 1 to step 2b assesses the significance of the Desire for Feedback by Computer Feedback interaction.

It is apparent that desire for feedback did not moderate the relationship between feedback and the self-report measures of cognitive processes that occurred during performance. However, desire for feedback may moderate the relationship between feedback and actual performance. Interactions between desire for feedback and the feedback variables were predicted. An F-change test was also used to test this prediction. Results are reported in Table 11. First, the possibility of significant three-way interactions was examined by comparing a model that included main effects and two-way interactions to a model with main effects, two-way interactions, and three-way interactions. The change in $R^2$ was not significant for either words per minute at time 2 or time 3 or for errors at time 2 or time 3: $F$ (4, 131) = .20, $p > .05$; $F$ (4, 131) = .10, $p > .05$; $F$ (4, 131) = 1.33, $p > .05$ $F$ (4, 131) = 1.17, $p > .05$ (respectively). Next, the possibility of significant two-way interactions was examined by comparing a model that included main effects and two-way interactions to a model with only main effects. The change in $R^2$ was not significant for either words per minute at time 2 or time 3 or for errors at time 1 or time 2: $F$ (3, 135) = .60, $p > .05$; $F$ (3, 135) = .37, $p > .05$; $F$ (3, 135) = 1.24, $p > .05$ $F$ (3, 135) = .90, $p > .05$ (respectively).

Table 11

Summary of Hierarchical Regression Analysis for Variables Predicting Performance

| Variables in equation | B | $R^2$ | F |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Dependent variable: WPM at time 2 | | | |
| Step 1 – WPM1 | .959 | .830 | |
| Desire for feedback | -.174 | | |
| Person feedback | .326 | | |
| Computer feedback | -.132 | | |
| Step 2 - WPM1 | .969 | .835 | |
| Desire for feedback | -.163 | | |
| Person feedback | -1.709 | | |
| Computer feedback | -1.725 | | |
| WPM1 X person feedback | .052 | | |
| WPM1 X computer feedback | .039 | | |
| Desire for feedback X person feedback | .033 | | |
| Desire for feedback X Computer feedback | .028 | | |
| | | | $\triangle F = .67$ |
| Step 3 - WPM1 | .975 | .841 | |
| Desire for feedback | -.193 | | |
| Person feedback | -1.804 | | |
| Computer feedback | -1.935 | | |
| WPM1 X person feedback | .058 | | |
| WPM1 X computer feedback | .039 | | |
| Desire for feedback X person feedback | .025 | | |
| Desire for feedback X Computer feedback | .041 | | |
| Person X computer | 1.715 | | |
| Desire for feedback X person feedback X computer feedback | -.13 | | |
| | | | $\triangle F = 1.20$ |
| Dependent variable: WPM at time 3 | | | |
| Step 1 – WPM1 | .978 | .848 | |
| Desire for feedback | -.313 | | |
| Person feedback | -.033 | | |
| Computer feedback | -.069 | | |
| Step 2 - WPM1 | .989 | .858 | |
| Desire for feedback | -.379 | | |
| Person feedback | -2.585 | | |
| Computer feedback | -2.945 | | |
| WPM1 X person feedback | .135 | | |
| WPM1 X computer feedback | .035 | | |
| Desire for feedback X person feedback | .131 | | |
| Desire for feedback X Computer feedback | .119 | | |
| | | | $\triangle F = 1.55$ |

| | | | |
|---|---|---|---|
| Step 3 - | WPM1 | .994 | .861 |
| | Desire for feedback | -.369 | |
| | Person feedback | -2.566 | |
| | Computer feedback | -2.865 | |
| | WPM1 X person feedback | .011 | |
| | WPM1 X computer feedback | .037 | |
| | Desire for feedback X person feedback | .130 | |
| | Desire for feedback X Computer feedback | .112 | |
| | Person X computer | -3.53 | |
| | Desire for feedback X person feedback X computer feedback | .213 | |
| | | | $\triangle F = .69$ |
| Dependent variable: Errors at time 2 | | | |
| Step 1 – | Desire for feedback | -.466 | .027 |
| | Person feedback | .521 | |
| | Computer feedback | -.284 | |
| Step 2 - | Desire for feedback | -.392 | .053 |
| | Person feedback, | .26 | |
| | Computer feedback, | -8.7 | |
| | Desire for feedback X person feedback | .02 | |
| | Desire for feedback X Computer feedback | .522 | |
| | | | $\triangle F = 1.24$ |
| Step 3 - | Desire for feedback | -.275 | .090 |
| | Person feedback | -2.02 | |
| | Computer feedback | -10.66 | |
| | Desire for feedback X person feedback | .164 | |
| | Desire for feedback X computer feedback | .641 | |
| | Person X computer | 3.81 | |
| | Desire for feedback X person feedback X Computer feedback | -.233 | |
| | | | $\triangle F = 1.33$ |
| Dependent variable: Errors at time 3 | | | |
| Step 1 – | Desire for feedback | -.363 | .026 |
| | Person feedback | .074 | |
| | Computer feedback | -.774 | |
| Step 2 - | Desire for feedback | -.253 | .045 |
| | Person feedback | 3.525 | |
| | Computer feedback | -6.59 | |
| | Desire for feedback X person feedback | -.207 | |
| | Desire for feedback X Computer feedback | .357 | |
| | | | $\triangle F = .90$ |

| | | | |
|---|---|---|---|
| Step 3 - | Desire for feedback | -.139 | .078 |
| | Person feedback | .975 | |
| | Computer feedback | -9.31 | |
| | Desire for feedback X person feedback | -.051 | |
| | Desire for feedback X computer feedback | .526 | |
| | Person X computer | 5.658 | |
| | Desire for feedback X person feedback X Computer feedback | -.354 | |
| | | | $\Delta F = 1.17$ |

## Discussion

In developing Feedback Intervention Theory, Kluger and DeNisi explored how feedback influences cognitive processing that can lead to improvement or impairment of performance. In an effort to test the processes proposed in their model, characteristics of feedback were manipulated.

According to FIT, feedback induces variable cognitive processing that results in variable performance. Computer-generated feedback was expected to result in improved performance due to processing at the task-motivation level. Person-mediated feedback was expected to lead to performance decrements due to processing at the meta-task level. Results revealed an attribute treatment interaction when the dependent variable was words per minute; however, no results were significant when the dependent variable was errors.

In order to examine the cognitive processing hierarchy proposed in FIT, participants responded to a questionnaire with items designed to assess level of processing initiated by the feedback. As measured by the questionnaire, participants did not demonstrate the predicted level of processing. Two items were designed to measure task-motivation; however, the items were not internally consistent suggesting they do not measure the same construct. A closer examination of the items provided insight into why

this occurred. One item (*While engaged in this task, I used feedback to help gauge my performance)* functioned as an indicator of attention to feedback rather than as an indicator of task-motivation processing. In fact, the pattern of responses to this item indicates that participants attended to the feedback manipulation. Participants who received feedback (either computer-generated or person-mediated) endorsed the item more than participants in the no feedback condition. Assuming the first item is an indication that the manipulation worked and if task-motivation processes were initiated, then those who receive computer-generated feedback should be more likely to endorse the remaining item (*While engaged in this task, I was focused on the general task objective.*). It was predicted that those who receive computer-generated feedback would be more likely to endorse this item. It was also predicted that some level of task-motivation would exist regardless of the presence of person-mediated (i.e. meta-task) feedback, but it should be lower if meta-task feedback was also present. This prediction was not supported because the interaction was not significant, and the main effect was not significant in the predicted direction – those who received computer feedback were actually less likely to endorse the item. Thus, as measured by these items, computer-generated feedback did not initiate task-motivation processes.

Instructions for the typing task were designed to communicate that the general task objective was to type as quickly and as accurately as possible. According to FIT, computer feedback maintains this level of processing while person-mediated feedback shifts attention to meta-task processing. It is possible that each participant created his/her own task objective.

Two items were designed to measure meta-task processing. These items also produced low internal consistency. The items may tap into different components of the same construct. The first item addressed others' opinions of the individual while the second item addressed the individuals' own opinions. For the first item assessing meta-task processing (*While engaged in this task, concern for other's opinion of me was my primary focus.*), both the main effect and the interaction were significant. This indicates that person-mediated feedback initiated meta-task processing, and additional computer-generated feedback may have created more meta-task attention by adding credibility to the manipulation. For the second item assessing meta-task processing (*While engaged in this task, my attention was directed inward -- I felt aware of characteristics of my "self."*), the main effect for person-mediated feedback approached significance, but the interaction was not significant. In general, results from these items suggested that person-mediated feedback initiates meta-task processing.

FIT also allows for moderators of the relationship between feedback and cognitive processing. A measure of desire for feedback as a stable individual difference was developed. Results of the factor analysis supported the hypothesis of unidimensionality, and the measure demonstrated good internal consistency. However, the predicted relationship between this characteristic and level of processing was not supported. When each of the cognitive processing items was the dependent variable, the interaction between desire for feedback and the feedback manipulations was not significant. This suggests that level of processing did not vary depending on desire for feedback.

Results reveal some support for hypotheses one and two. The feedback manipulations indicate the type of feedback produced changes and performance, and these performance changes depended on ability. It may be that the cognitive processing predicted by FIT occurs when ability is high, but the predictions are not accurate when ability is low. This suggests that future FIT research should include a measure of ability.

FIT is intended to be a means of explaining the *process* that governs the feedback performance relationship. In their meta-analysis, Kluger and DeNisi conclude that the effect of feedback on performance is variable, i.e. not universally positive. Results reveal that level of performance is lower when positive person-mediated is given than when no feedback is given for high ability participants. FIT would also predict lower performance when negative person-mediated feedback is given compared to when no feedback is given, but performance under these two conditions was the same. Also consistent with FIT, high ability participants performed better when objective computer-feedback was given that when it was not given.

FIT is consistent with goal setting theory and control theory. All three argue that discrepancies or goals motivate behavior. FIT emphasizes that these discrepancies exist internally. Control theory and goal setting theory do not emphasize this, but the possibility is not excluded. However, the theories differ based on what creates the salience of the discrepancies. FIT argues that *feedback* not only makes internal discrepancies salient but can actually alter level of discrepancy processing. Control theory and goal setting theory argue that the discrepancy is made salient by drawing attention to the desired end result, and the weakness of these approaches is that they assume the level of discrepancy processing is constant.

FIT asserts the generalization the feedback is enough to make discrepancies salient – this is an assumption of FIT that does not allow for situational limitations. This study manipulated feedback alone, i.e. there was not discrepancy creation or goal setting manipulations. The results indicate that this feedback manipulation resulted in variable performance, depending on ability. Thus, the assumption of FIT that feedback alone makes a discrepancy salient it tenable. If an intervention, such as goals, is used to make discrepancies salient, FIT would argue that it is not the goal discrepancy initially created that produces the change in behavior. Feedback alters the discrepancy, and it is the final level of processing that produces the change in behavior. In short, the resulting change in behavior would still be attributed to feedback rather than goal setting.

Perhaps one weakness of FIT is that it tries to tackle change in performance due to discrepancy reduction in two areas - performance and self image. On the one hand, attention to a discrepancy between current performance and the way one wants to perform can lead to improved performance. But on the other hand, attention to a discrepancy between one's self-image and the self-image implied by a level of performance can lead to a decline in performance. Control theory, which FIT borrows heavily from, is based on the former -- change in performance is attributed to reducing a discrepancy between current performance and a performance standard. Self-efficacy theory is based on the latter -- change in performance is attributed to a self-evaluative reaction of progress towards self-set goals. However, self-efficacy theory predicts improved performance, and FIT predicts performance decline. More research is necessary to resolve this discrepancy.

Kluger and Denisi (in press) begin to address this issue in recent research that expands the concept of self. Using Higgins 's framework, they suggest that discrepancies created by an actual-self/ideal-self comparison can never be eliminated, and performance will always increase in an effort to decrease this discrepancy. However, if the discrepancy is created by an actual-self/ought-self comparison, performance will increase until the discrepancy is eliminated but decrease once the ought-self standard is met. This is consistent with FIT because these self-images are individually specific and set internally. Furthermore, Higgins's theory of self-guides explains asymmetrical effects within a social cognitive framework.

FIT clearly predicts asymmetric effects in performance, yet it is based on theories that predict symmetric effects in performance (control theory and self-efficacy theory). Recently, Kluger has expanded the reasoning for how feedback results in asymmetric effects on performance (Kluger, in press). Kluger (in press) explains that the sign of the discrepancy is what creates asymmetrical effects. When the sign of the discrepancy is positive, task focus decreases but when the sign of the discrepancy is negative, task focus increases. He argues that the relationship between feedback sign and performance is moderated by the magnitude of the discrepancy. For example, when feedback sign is positive, non-task thoughts increase unless the magnitude of the discrepancy is very large in which case non-task thoughts decrease and task focus increases. The implication is that as non-task thoughts increase, attention shifts to the meta-task processing level of the FIT hierarchy. This expansion of FIT helps explain the cause of the asymmetric effects of feedback on performance in terms of feedback characteristics.

Limitations and Future Directions

One difficulty of this investigation, and all FIT research, is the difficulty of measuring cognitive processing. This study attempted to measure cognitive processing using a self-report questionnaire. The measure was given at the end of the performance trials to avoid contaminating thought processes during task performance. If participants are able to self report cognitive processing, the measure was a more accurate indicator of their current processing rather than of processing during the trials. Future research should explore alternative methods for assessing level of processing. FIT posits that an increase in self-focus rather than task-focus is what drives performance decrements following person-mediated feedback. Many researchers have successfully induced self awareness having participants engage in a task in front of a mirror (e.g. Hutton & Baumeister, 1992). It stands to reason that this manipulation would induce meta-task processing.

Recent research suggests that individuals' responses to feedback from another person vary depending on the style of feedback presentation. One of the most common phenomena observed in intrinsic motivation research is that competence feedback delivered in a controlling style causes performance to suffer while competence feedback delivered in an informational style causes performance to improve. Informational feedback is defined as feedback that "enhances the recipient's sense of internal causality" while controlling feedback "stresses the desires and demands of an external force" (Zhou, 1998, p. 263). In this study, characteristics of the positive feedback were more consistent with informational feedback while characteristics of the negative feedback were more consistent with controlling feedback. Although the negative feedback in this study was

consistent with the definition of controlling feedback, it did not produce performance decrements as the intrinsic motivation research suggests it should. Nonetheless, future research should consider feedback style in the manipulation of person-mediated feedback.

Furthermore, the type of task, i.e. when performance is driven by intrinsic motivation versus when performance is driven by extrinsic motivation, should also be examined as a moderator of FIT. Zhou (1998) examined the influence of feedback style and valence on performance on a task assumed to be driven by intrinsic motivation. Zhou uncovered an interaction such that participants who received positive feedback in an informational style outperformed all other participants, and those who received negative feedback in a controlling style performed worst. These results are not consistent with the recent expansion of FIT, which predicts negative feedback increases task focus. One explanation that reconciles these conflicting results is that FIT processes depend on the motivational force driving performance. Future research should examine this possibility.

Desire for Feedback was presented as an individual difference. Some would argue that the Big Five personality traits represent an exhaustive list of individual differences that influence behavior. Desire for feedback may be a context specific manifestation of one or more of these characteristics. Future research should investigate the relationship between Big Five characteristics and Desire for Feedback. Furthermore, Big Five traits should be examined as moderators of the relationships proposed in FIT.

## References

Ashford, Susan J. & and Cummings, L.L. (1983). Feedback as an individual resource: personal strategies of creating information. *Organizational Behavior and Human Performance*, **32,** 370-398.

Bandura, A. & Cervone, D. (1986). Differential engagement of self-reactive influences in cognitive motivation. *Organizational Behavior and Human Decision Processes*, **38**, 92-113.

Baumeister, R. F., Hutton, D. G., & Cairns, K. (1990). Negative effects of praise on skilled performance. *Basic and Applied Social Psychology*, **11(2)**, 131-148.

Brown, Jonathon, D. (1990). Evaluating one's abilities: shortcuts and stumbling blocks on the road to self-knowledge. *Journal of Experimental Social Psychology,* **26**, 149-167.

Butler, Ruth (1987). Task-involving and ego-involving properties of evaluation: effects of different feedback conditions on motivational perceptions, interest, and performance. *Journal of Educational Psychology*, **79 (4)**, 474-482.

Carver, C. S.; Antoni, M.; Scheier, M. F. (1985). Self-Consciousness and Self-Assessment. *Jounal of Personality and Social Psychology*, 48 (1), 117-124.

Carver, C. S & Scheier, M. F. (1982). Control theory: a useful conceptual framwork for personality-social, clinical, and health psychology. *Psychological Bulletin,* **92 (1),** 111-135.

Collins, B.E. (1974). Four Components of the Rotter Internal-External scale: Belief in a difficult world, a just world, a responsive world, and a politically responsive responsive world. *Journal of Personality and Social Psychology,* **29**, 381-391.

Early, P. C. Northcraft, G. B., Lee, C., & Lituchy, T. R. (1990). Impact of process and outcome feedback on the relation of goal setting to task performance. *Academy of Management Journal*, **33 (1)**, 87-105.

Fedor, D. B., Rensvold, R. B., & Adams, S. M. (1992). An investigation of factors expected to affect feedback seeking: a longitudinal field study. *Personnel Psychology*, **45**, 779-805.

Fenigstein, A., Scheier, M.F., Buss, A.H. (1975). Public and Provate Self-Consciousness: Assessment and theory. *Journal of Consulting and Clinical Psychology*, **43(4)**, 522-527.

Herold, D. M., Parsons, C. K. & Rensvold, R. B. (1996). Individual differences in the generation and processing of performance feedback. *Educational and Psychological Measurement*, **56 (1)**, 5-25.

Hutton, D. G. & Baumeister, R. F. (1992). Self-awareness and attitude change: seeing oneself on the central route to persuasion. *Personality and Social Psychology Bulletin*, **18 (1)**, 68-75.

Ilgen, D. R., Fisher, C. D., & Taylor, M. S. (1979). Consequences of individual feedback on behavior in organizations. *Journal of Applied Psychology*, **64 (4)**, 349-371.

Ilgen, D. R. & Moore, C. F. (1987) Types and choices of performance feedback. *Journal of Applied Psychology*, **72 (3)**, 401-406.

Kluger, Avraham (1998). Feedback-expectation discrepancy, arousal and locus of attention. In M. Erez, U. Kleinbeck, & H. K. Thierry (Eds.), Work motivation in the context of a globalizing economy. Lawrence Erlbaum.

Kluger, A. N. & DeNisi, A. (1996). The effects of feedback interventions on performance: a historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin*, **119( 2)**, 254-284.

Kluger, A. N. & DeNisi, A. (in press). Feedback Interventions: Towards the understanding of a double-edge sword. *Current Directions in Psychological Sciences.*

Levy, P. E., Albright, M. D., Cawley, B. D., & Williams, J. R. (1995). Situational and individual determinants of feedback seeking: A closer look at the process. *Organizational Behavior and Human Decision Processes*, **62(1)**, 23-37.

Locke E. A., & Latham, G.P. (1990). *A theory of goal-setting and task performance*. Englewood Cliffs, NJ: Prentice Hall.

Matsui, T., Okada, A., & Inoshita, O. (1983). Mechanism of feedback affecting task performance. *Organizational Behavior and Human Performance*, **31**, 114-122.

Rotter, J.B. (1966). Generalized expectancies for internal and external control of reinforcement. *Psychological Monographs: General and Applied*, **80**, 1-28.

Ruzzene, M. & Noller, P. (1986). Feedback motivation and reactions to personality interpretations that differ in favorability and accuracy. *Journal of Personality and Social Psychology*, **51 (6)**, 1293-1299.

Snyder, C. R., Ingram, R. E., Handelsman, M. M. & Wells, D. S. (1982). Desire for persoanl feedback: Who wants it and what does it mean for psychotherapy. *Journal of Personality*, **50(3)**, 316-330.

Snyder, Mark (1974). Self-monitoring of expressive behavior. *Journal of Personality and Social Psychology*, **30(4)**, 526-537.

Swann, W. B., Hixon, J. G., Stein-Seroussi, A. & Gilbert, D. T. (1990). The fleeting gleam of praise: cognitive processes underlying behavioral reactions to self-relevant feedback. *Journal of Personality and Social Psychology*, **59 (1)**, 17-26.

Zhou, Jing (1998). Feedback valence, feedback style, task autonomy, and achievement orientation: Interactive effects on creative performance. *Journal of Applied Psychology*, **83 (1),** 261-276.

## Appendix 1

## Feedback Survey

Please answer these questions using the following scale.

| disagree | somewhat disagree | neutral | somewhat agree | agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

1. Others' evaluation of my performance provides little useful information.

*2. I like getting feedback from others concerning my performance.

*3. Even when I think I have done a good job, I feel a lot more confident of it after someone tells me so.

4. I enjoy receiving feedback from others because it helps me improve my performance.

5. How others view my performance is not important to me.

6. I do not think I benefit from being evaluated by others.

⊗7. I feel uncomfortable when others suggest areas where I need improvement.

⊗8. I prefer to assess my performance based on feedback from others.

9. It is important for me to know how others evaluate my performance.

10. I do not want feedback from others.

---

* Items from Herold, Parsons, and Rensvold, 1996.

⊗ Items deleted from analysis due to low factor loadings.

## Appendix 2

## Measure of Level of Hierarchy Receiving Attention

*1. While engaged in this task, I used feedback to help gauge my performance.*

| Disagree | somewhat disagree | somewhat agree | agree |
|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

*2. While engaged in this task, concern for others' opinion of me was*

| Not my primary focus | a moderate focus | my primary focus |
|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

*3. While engaged in this task, I was focused on the general task objective.*

| Disagree | somewhat disagree | somewhat agree | agree |
|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

*4. While engaged in the task, my attention was directed inward – I felt aware of characteristics of my "self."*

| Disagree | somewhat disagree | somewhat agree | agree |
|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

**Jean-Anne H. Schmidt**

1002 Airport Road
Blacksburg, VA 24060
(540) 961-5819
jahughes@vt.edu

**Education**

**1998 M.S.** **Industrial/Organizational Psychology,** Virginia Polytechnic Institute and State University, Blacksburg, VA (GPA: 3.7/4.0). Thesis: *The Influence of Feedback Interventions on Task-Motivation and Meta-Task Processes: An Examination of Feedback Intervention Theory.*

**1995 B.S.** **Psychology,** Clemson University, Clemson, SC (GPA: 3.6/4.0). Graduated Cum Laude.

**Experience**

**5/97-present** **Graduate Assistant,** Virginia Polytechnic Institute and State University, Blacksburg, VA.
Designed interactive statistics tutorial for the World Wide Web. Wrote technical material to be included in the tutorial and designed interactive activities to reinforce this material. Assisted with the evaluation of the usability of the tutorial. Designed tests to measure performance following the use of the tutorials and analyzed the results.

**8/96-5/97** **Graduate Teaching Assistant,** Virginia Polytechnic Institute and State University, Blacksburg, VA.
Instructed Introductory Psychology Labs. Organized lectures. Led in-class discussions, graded quizzes and essays.

**Research Experience**

**Thesis Research** Neil M. A. Hauenstein, Ph.D. (Chair). Designed and implemented a laboratory study evaluating the effect of feedback on level of cognitive processing and performance.

**Independent Research** Neil M. A. Hauenstein, Ph.D. (Chair). Assisted with the design and implementation of a laboratory study evaluating the effect of rater training on rater accuracy.

**Presentations**

**1998** Schmidt, J. A. H. & Hauenstein, N. M. A. (1998, March). Rater Training and Rating Accuracy: A Comparison of Frame of Reference Training, Rater Error Training, and Rater Variability Training. Presented at the 19th Annual Industrial-Organizational/Organization-Behavior Graduate Student Conference. San Diego, California.

**1999** Hauenstein, N., Facteau, J. & Schmidt, J. A. (1998, April). Rater Variability Training: An alternative to Rater Error Training and Frame-of-Reference Training. Proposal submitted for acceptance to the 14th Annual Society for Industrial and Organizational Psychology Conference. Atlanta, GA.

**1999** Hauenstein, N., Facteau, J. & Schmidt, J. A. (1998, April). Rater Variability Training: An alternative to Rater Error Training and Frame-of-Reference Training. Manuscript submitted for publication.