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The purpose of the present study was to examine the use of combined positive and corrective feedback statements to improve performance in the presence of a performance goal. A within-subjects design was used to expose participants to 4 feedback statement sequences: (a) no feedback; (b) PCP (positive, corrective, positive); (c) CPP (corrective, positive, positive); and (d) PPC (positive, positive, corrective). Providing participants with a combination of positive and corrective feedback statements, regardless of sequence, was hypothesized to lead to higher task performance than not providing feedback. Ad hoc analyses were conducted to examine the most preferred feedback statement sequence and type of feedback (positive or corrective), as well as the influence that core self-evaluation, job satisfaction, goal commitment, and stress on performance. Results revealed that task performance was higher when feedback, in general, was provided; a statistically significant difference in task performance did not exist across the 3 feedback statement sequences. Despite the lack of differential effects on performance, 47% of participants identified the session during which they received the CPP feedback statement sequence as their most preferred. Further, 53% of participants self-reported they preferred positive feedback, while 25% preferred corrective feedback. Individual preferences for feedback statement sequences support the need for open communication between the feedback receiver and provider to increase task performance.

Keywords: feedback sequence, goals, feedback preference, task performance

Many factors influence task performance and an individual's persistence to work toward performance-based goals. Although substantial research supports the use of providing individuals with feedback that is tied to one's progress toward goal attainment (e.g., Balcazar, Hopkins, & Suarez, 1985; Locke & Latham, 2013), research specifically evaluating characteristics of the feedback statements, themselves, on performance is not widespread. Further, goal setting literature has predominately focused on individuals' abilities and willingness to persist toward easy, moderate, and difficult (yet attainable) performance goals (Jeffrey, Schulz, & Webb, 2012; Lee, Locke, & Phan, 1997; Locke, 2004; Locke & Latham, 2013; Wright, 1989). Little work has been done, however, to assess factors that attenuate the potential negative impact of goals that are too challenging (sometimes referred to as "stretch" goals) on goal commitment and individual task performance (Ordonez, Schweitzer, Galinsky, & Bazerman, 2009). Due to the widespread use, acceptance for, and effectiveness of using feedback and goal setting simultaneously, the present study examined the use of positive and corrective feedback statement sequences as a way to improve performance in the presence of an intended challenging goal. This study contributes to the small amount of empirical literature on feedback statement sequences (Henley & Di-

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Gennaro Reed, 2015; Sundberg, 2015) through its evaluation of individually tailored feedback sequence statements that provided individuals with information related to both the quality and quantity of their performance in relation to an assigned goal. This study sought to demonstrate that providing participants with a combination of positive and corrective feedback statements, regardless of sequence, would increase task performance in comparison to not providing feedback. Additionally, ad hoc analyses were used to examine the influence that core self-evaluation, job satisfaction, goal commitment, and stress may have on performance toward a goal when individuals are provided with various feedback statement sequences.

Performance Feedback

This study contributes to the performance feedback literature that currently describes performance feedback as a provision of information about previous performance that allows individuals to change or adjust their future behavior (Daniels & Daniels, 2006). Applications of feedback to improve performance have been implemented across a variety of settings and behaviors, including to provide safety hazard feedback for department supervisors in manufacturing production (Sulzer-Azaroff & de Santamaria, 1980), to provide written and verbal performance feedback regarding lifting techniques for employees in a residential facility (Alavosius & Sulzer-Azaroff, 1986), and to increase safety belt frequency in pizza delivery service (Ludwig & Geller, 1991). Feedback's widespread use is supported by its presence within the literature, having been identified as the most common independent variable cited in both the *Journal of Applied Behavior Analysis (JABA)* and the *Journal of Organizational Behavior Management* (*JOBM*; Balcazar, Shupert, Daniels, Mawhinney, & Hopkins, 1989; Nolan, Jarema, & Austin, 1999; Prue & Fairbank, 1981).

Balcazar, Shupert, Daniels, Mawhinney, and Hopkins's (1989) evaluation of the effectiveness of performance feedback revealed that performance feedback, by itself, was only effective in 28% of studies, but the effectiveness of performance feedback jumped to 53% when feedback and goal setting were combined. Similar reviews of the feedback literature 10 years later revealed that the number of studies including applications of feedback had increased to 71% and supported many of the primary findings of Balcazar, et al.'s (1989) review (e.g., Alvero, Bucklin, & Austin, 2001; Nolan et al., 1999). Due to continued and increasing research interests concerning the effects of feedback, *JOBM* published a special issue titled, *Performance Feedback: From Component Analysis to Application* (Houmanfar, 2013).

Function of Feedback

To effectively use performance feedback, it is important to understand the function of feedback. Ilgen, Fisher, and Taylor (1979) examined the multidimensional nature of feedback and its ability to influence individual behavior. Specifically, they emphasized three major aspects of feedback that influence behavior: (a) the way feedback is perceived, (b) the extent to which feedback is accepted, and (c) the willingness of the recipient to respond to the feedback. Ilgen et al. (1979) suggest that the recipient of the feedback must accept the information being provided in order for the intervention to be effective and improve performance. Further, Ilgen et al. (1979) contend that goal setting acts as an intermediate step between feedback and performance improvement; feedback provides information that can be used to evaluate the current level of performance in relation to goal and informs the need for change in future performance. Lastly, the authors suggested that future studies should look at how the recipient perceives negative (i.e., corrective) feedback (e.g., accuracy) and how the recipient perceives the source of the feedback (e.g., trustworthy). Following their recommendation, Ilgen and Davis (2000) investigated the receptivity of negative feedback and suggested that the most critical issue for delivering negative feedback is the balance between having individuals accept responsibility for substandard performance and, at the same time, preventing a decrease in one's self-concept because of receiving negative feedback. From a behavioral perspective, this may relate to the use of feedback supported by data (objective vs. subjective), a focus on behavior that is within the performer's control, and identification and discussion of environmental and social factors outside the performer's control that may influence performance. Although Ilgen and Davis (2000) emphasize the importance of turning negative feedback into a

learning experience, they did not examine the use of specific feedback statements.

Researchers have pointed out the similarities between feedback procedures and reinforcement or punishment procedures (e.g., Duncan & Bruwelheide, 1985; Peterson, 1982), which explains why feedback is sometimes posited to function as a reinforcer or punisher (Mangiapanello & Hemmes, 2015). Prue and Fairbank (1981) argued that feedback could introduce a positive reinforcement contingency into a setting that typically supports negative reinforcement contingencies. For example, when a supervisor scolds an employee for not meeting their monthly sales quota, a *negative reinforcement* contingency would be in effect *if* the employee *increases* their production just enough to meet the sales quota and *avoid* being scolded by the supervisor again). As an alternative to "scolding," a supervisor might choose to provide the employee with feedback in a way that the employee will better accept (e.g., objective performance data in comparison to their goal). If this type of feedback evokes an increase in desired performance in order to achieve one's goal, one might say that the feedback has introduced a positive reinforcement contingency into this setting, as the employee is no longer working to avoid negative consequences (i.e., scolding). There is, however, some controversy over this perspective because the behavioral function of feedback is often unknown or may simultaneously serve multiple functions (Duncan & Bruwelheide, 1985; Peterson, 1982). Despite the varying views, implications, and procedures used to implement feedback, providing individuals with feedback is suited for settings in which there is a desire to increase performance with a relatively low cost commitment (Daniels & Daniels, 2006; Prue & Fairbank, 1981).

Johnson (2013) demonstrated feedback reinforcement and punishment procedures in a component analysis where the effects of objective feedback (description of the previous day's performance) and evaluative feedback (statements consistent with excellent, good, average, or poor performance on the previous day) were dissociated. Although both types of feedback were associated with higher performance in comparison to a no-feedback condition, results revealed that performance was considerably higher when the two types of feedback (i.e., objective and evaluative) were combined and provided to participants. Johnson reasoned that the evaluative feedback might have acted as an establishing or abolishing operation, influencing the effectiveness of objective feedback as either a reinforcer or punisher, respectively.

Feedback Statement Sequencing

The Feedback "Sandwich"

Few researchers have explored the impact of the combined use of positive and negative statements on an individual's performance; therefore, this study seeks to expand the literature on feedback statement sequences. The most recognizable form of this type of combined feedback has been referred to as the feedback "sandwich." While using the feedback sandwich, the feedback deliverer (e.g., teacher, manager, or trainer) provides a positive statement followed by a corrective statement followed by another positive statement. Wyatt Woodsmall developed the feedback sandwich while conducting research for the United States Army on how teachers could deliver effective feedback to new recruits (James & Shephard, 2001). The sandwich sequence has gained a great deal of support across a variety of disciplines ranging from physicians providing feedback to staff in a family practice (Dohrenwend, 2002) to coaches administering feedback to their athletes during practice and competition (Hanson, n.d.).

According to Daniels (2009), however, there are few empirical studies to support this recommendation or that the use of the feedback sandwich sequence improves individual performance. Daniels noted the sandwich sequence may confuse the recipient and obscure the real meaning for the performance feedback (i.e., the explanation and discussion of the corrective statement). By placing corrective feedback in the middle of two positive statements, the corrective feedback tends to be overshadowed by the positive points in the beginning (primacy effect) or at the end (recency effect). As such, the feedback sandwich sequence may cause individuals to anticipate that a criticism will always follow a positive statement. Further, Daniels explained that this sequence can jeopardize the worth of positive feedback when it is continuously associated with corrective feedback. Over time, employees may begin to doubt their manager's honesty regarding positive perfor-

mance feedback. Lastly, if managers create statements about positive behaviors in order to provide employees with constructive criticism, individuals may leave with an overstated and inaccurate understanding of how they are actually performing (Daniels, 2009).

Von Bergen, Bressler, and Campbell (2014) examined the sandwich sequence with regard to the benefits experienced by both the deliverer (individual providing the feedback) and the receiver (individual receiving the feedback). Von Bergen et al. (2014) identified many reasons why managers choose to use the sandwich sequence instead of other techniques when delivering constructive criticism. Foremost, managers are often taught to deal with workers' poor performance by using the feedback sandwich because this feedback statement sequence makes the deliverer (i.e., manager) feel "better" about providing criticism; however, it is unsure whether this lesson is learned in school or a recommendation from another manager. When managers were queried about why they use the sandwich sequence, they confirmed that the approach alleviated some of the pressure when delivering negative (i.e., corrective) performance feedback and that starting the conversation with a positive statement relaxed them (the managers). From a behavior analytic viewpoint, then, the delivery of feedback in this manner may elicit positive feelings or evoke positive self-talk (i.e., "I'm a good manager"); thus, "feeling better" and "feeling relaxed" would be a positive reinforcer for the manager's behavior.

According to Nelson and Quick (2013), the intent behind the sandwich sequence is to reduce defensiveness, improve useful communication, and make the information better tolerated by the person receiving the feedback. Thus, using the feedback sandwich sequence may result in avoidance of negative consequences associated with the receiver's reaction to corrective feedback (e.g., emotional outburst) or the escape from a negative conditioned emotional response (e.g., anxiety, pressure) in anticipation of delivering corrective feedback; in this case, the manager's behavior would be a negatively reinforced. It is important to note, however, that when employees were asked how they preferred to receive feedback on their job performance, most employees stated they only wanted the substance (i.e., the criticism; Von Bergen et al., 2014).

Other Feedback Statement Sequences

Although research has typically focused on the traditional sandwich sequence, Davies and Jacobs (1985) evaluated four feedback statement sequences including positive-negative-positive (PNP), positive-positive-negative (PPN), negative-positive-negative (NPN), and negative-negative-positive (NNP). Groups of eight participants engaged in a problem-solving exercise and received an assigned feedback statement sequence in front of the group from each member. Participants rated on a scale of 1–9 which feedback statement sequence they felt was the most credible, desirable, and their emotional reaction (strong or weak) to the feedback. Higher scores on the scale represented higher credibility and desirability, and a stronger emotional reaction to the feedback statement sequence. Results indicated no significant difference between PNP and PPN feedback ratings. However, PNP ratings were significantly higher than the NPN ratings for credibility and desirability, and PPN ratings were significantly higher than NNP. The authors did not find any significant difference between PPN and NPN ratings. Additionally, there were no significant differences in strength of emotion ratings across the four feedback statement sequences. Although Davies and Jacobs (1985) studied a variety of feedback statement sequences, they did not measure the impact of these sequences on an individual's performance or in conjunction with assigned performance goals.

Performance Goals

Locke and Latham (2013) define a goal as "the object or aim of an action," such as, to attain a specific standard of proficiency (p. 4). Similarly, Fellner and Sulzer-Azaroff (1984) describe a goal as the desired outcome of a particular behavior or set of behaviors, typically utilized in a predetermined time frame. In their review of the goal setting literature, Locke, Shaw, Saari, and Latham (1981) found strong support for the use of goals of varying levels of difficulty to influence individual behavior. In the literature, goal difficulty refers "loosely" to the probability of attaining the goal, and researchers generally classify goals as (a) easy; (b) moderate; (c) difficult (challenging, yet attainable); or (d) not specified (Lee, Locke, &

Phan, 1997). In addition to these categories, "stretch" goals are identified in the literature and distinguished from difficult goals as challenging and typically unattainable goals (Jeffrey, Schulz, & Webb, 2012). In addition to being extremely difficult, stretch goals have also been described as novel (Zhang & Jia, 2013). Although goal-setting literature research consistently reports a positive relationship between goal difficulty and performance (Locke & Latham, 2002), Ordonez, Schweitzer, Galinsky, and Bazerman (2009) discuss the negative impact of goals that are too challenging ("stretch" goals) on performance when the environment is not set up to support these goals. Ordonez et al. (2009) suggest that challenging goals can inspire effort, commitment, and performance; however, when the work environment is not supportive, failure to reach goals may be associated with risky attitudes, unethical behavior, and psychological costs. According to Daniels (2009), goals that are too challenging, such as stretch goals, are often set without providing necessary work environment resources, such as training and coaching, time, support personnel, equipment, and other support items. Without an environment that supports the expected changes in performance necessary to meet these goals, negative outcomes are more likely to occur (e.g., unhappy boss, counterproductive employee behavior, fired employee).

Research supports the contention that specific and challenging goals lead to higher levels of persistence toward the goal and higher task performance than easy goals, "do your best" goals, or no goals (Locke, Chah, Harrison, & Lustgarten, 1989; Locke & Latham, 2002). One reason do-your-best goals may be less successful at improving performance is because they have no external referent and are often defined idiosyncratically (Locke & Latham, 2002). When performance is fully controllable, goal specificity does reduce variation in performance by reducing the ambiguity about what is to be attained (Locke et al., 1989).

Two primary approaches for assigning goals at various levels of difficulty exist within the literature: (a) "one goal for all" and (b) ability-based. Using the "one goal for all" approach, Lee, Locke, and Phan (1997) defined three levels of goal difficulty: easy (.90 expected probability of attaining the goal), moderate (.50 expected probability of attaining the goal), and difficult or challenging (.10 expected probability of attaining the goal). Jeffrey, Schulz, and Webb (2012) added *challenging but achievable* goals to Lee et al. (1997) original goal difficulty categories and described these as goals for which there is a 20%–50% probability of individual goal attainment.

Ability-based goals can be used and assigned in a variety of ways, such as setting a unique goal for each individual (Chow, Lindquist, & Wu, 2001; Slowiak, 2015) or having multiple goal levels, which are assigned to individuals based on ability groupings that are determined by past performance on the task (Bateman & Ludwig, 2003; Locke, 2004). In a recent study, Slowiak (2015) assigned individually tailored goals based on individuals' pretest session performance; goals were categorized as: easy (set at the same level as pretest performance), moderate (10% above the participant's pretest session performance), and difficult (20% above the participant's pretest session performance). Slowiak (2015) had participants engage in the task before assigning each participant a tailored performance goal. Though Slowiak's (2015) research provides an insightful framework for the assignment of individual goals, pilot data revealed that most participants met their "difficult" goal during one of the three experimental sessions. In addition, self-report data indicated that only one participant perceived their difficult goal as "difficult." Therefore, future research should consider these findings when using a similar approach to define levels of goal difficulty.

Over 400 studies have examined the relationship of goal difficulty and specificity with performance, and results have consistently shown that people adjust their effort to align with the difficulty of the task (Jeffrey et al., 2012; Locke & Latham, 2002). Jeffrey and colleagues found "ability-based" goals are more effective at improving performance than a "one goal for all" approach. While customizing individual ability-based goals, feedback providers are able to review previous performance, create goals, and provide useful information that reflects an individual's current and past performance. Although the one goal for all approach may be more convenient to implement, it may result in decreased motivation for lower or higher performing individuals since goal assignment is based on the group's previous "average" perfor-

mance (Fisher, Peffer, & Sprinkle, 2003). Further, in order to calculate probabilities associated with goal attainment for the one goal for all approach, current levels of performance must be known for *all* individuals before the assigned performance goal can be set. With the one goal for all approach, low performers may perceive an assigned group goal as a "stretch goal," while high performers may perceive their group goal as an "easy goal." The discrepancy of perceived goal difficulty between high and low performers might explain variance in task performance when using the one goal for all approach. Thus, assigning individual, ability-based goals may be more efficient and more equitable than using the one goal for all approach. Furthermore, ability-based goals have been shown to lead to sustained effort and performance over time (e.g., Chow et al., 2001).

Regardless of the level of difficulty or the approach used to set goals, findings from both the goal-setting and feedback literatures tend to conclude that goals and feedback, individually, are less effective in influencing performance than the combination of goals and feedback together (e.g., Bandura & Cervone, 1983; Locke & Latham, 2002). Ilgen et al. (1979) highlighted the benefit goals can play when providing individuals with performance feedback. Using *performance toward goals* as the focal point of the conversation, feedback deliverers are able to provide statements to performers based on specific and observable behaviors. This combination of goal setting with feedback allows individuals to monitor and alter their performance in relation to their goals (Locke & Latham, 2002). Thus, without feedback, individuals are unable to adjust their actions and efforts in order to increase their likelihood of attaining the goal.

Function of Goals

Understanding the function of goals is necessary, especially when paired with performance feedback, in order to effectively improve performance. Bandura's (1978) research on social learning theory suggested that the discrepancy between an individual's actual performance and their goal (when identified through feedback) may serve as a motivator for an increase in performance effort. Agnew (1998) asserted that the presence of a goal acts as an establishing operation/motivating operation (EO/MO) and that positive feedback (indicating improved performance or goal achievement) is more valuable in the presence of the goal compared to no goal. As an EO/MO, the goal alters the value of feedback, increasing the reinforcing effectiveness of feedback that is indicative of goal achievement and subsequently evoking behaviors that have previously led to increased performance. Locke (1968) supported the contention that both information about current performance and a goal are necessary in order to motivate an individual and increase their performance. Morrison and Weldon's (1990) findings provide additional support for Locke's (1968) contention. In their study, individuals self-sought feedback by performing an intermediate count of productivity while engaging in a brainstorming task; performance increased when individuals were assigned specific goals. Results revealed that the absence of either performance feedback or a goal (i.e., performance standard) hindered the individual's ability to evaluate their performance.

Locke and Latham's (2002) analysis of goal setting theory revealed the importance of the individual's level of commitment to the assigned goal as a necessary factor to increase task performance. Many researchers have investigated the influence of monetary incentives as a way to increase performance and assess effects on goal persistence and commitment. Lee et al. (1997) sought to explain the effects of incentives on performance when individuals were assigned a goal, as well as the influence of self-efficacy and personal goals. Participants were provided feedback after their first trial, and researchers discovered a large drop in difficult goal performance when it became clear to the individual that they would not earn their bonuses. Therefore, Lee et al. (1997) concluded that monetary rewards would not affect performance unless people believe they can perform well enough to reach the goals necessary to obtain the reward. From a behavioral viewpoint, a goal may only continue to function as an EO/MO under the condition that the individual has the knowledge, skills, and abilities to perform the task and contact the positive reinforcers associated with goal attainment (e.g., monetary rewards, praise, positive feedback).

Mowen, Middlemist, and Luther (1981) identified that a majority of early goal setting studies

had investigated the influence of various monetary systems and environmental factors on easy and moderate goals but that only a few studies had included challenging goals in their analyses. Mowen et al. (1981) explored the relationship between pay systems and goal difficulty on performance, demonstrating that when participants were assigned highly difficult goals, task performance was lower in a bonus incentive system compared with a piece-rate incentive system. Mowen et al.'s (1981) results helped to clarify the inconsistent findings in literature by Locke (1968) and Becker (1978), which had originally pointed to a positive linear relationship between goal difficulty and task performance. Mowen et al.'s (1981) research revealed that the effects of pay on difficult goal performance might partly depend on the type of incentive structure utilized.

Wright (1989) and Lee et al. (1997) suggest that multiple trials and sessions are needed in order for an individual to evaluate goal-attainability. Mowen et al. (1981) and Wright (1989) also recommended that future research more closely investigate performance when individuals receive feedback related to specific, difficult goals and are paid an hourly wage. Despite their recommendations, research on the effects of pay systems and incentives as factors influencing performance toward a difficult goal has led to inconsistent findings (e.g., Jeffrey et al., 2012; Locke & Latham, 2002). In order to extend existing literature, the current study explored the effect of performance feedback on task performance when individuals were given a specific, challenging goal and pay was kept at a consistent hourly wage.

Feedback Statement Sequencing and Goals

Two recent empirical studies have investigated the influence of feedback statement sequences, goals, and timing of feedback on task and quality performance. First, Henley and DiGennaro Reed (2015) investigated the influence of four feedback statement sequences on participants' preference for each feedback statement sequence and the quality of task performance. The four feedback statement sequences were (a) no feedback; (b) positive, corrective, positive (PCP); (c) corrective, positive, positive (CPP); and (d) positive, positive, corrective (PPC). Two types of positive statements were provided to participants: a positive, task-specific statement (e.g., "I like how you kept the brochures organized in a neat pile") and a positive, generic statement (e.g., "You are doing a wonderful job"). The corrective statement focused on the task *quality* (e.g., "Next time, make sure that all of the time sheets are facing forward before filing them"). Results revealed that the CPP feedback statement sequence had a greater impact on quality performance than the PCP and PPC feedback statement sequences on these quality-based tasks (i.e., CPP $>$ PCP $>$ PPC). Henley and DiGennaro Reed (2015) also examined the effects of providing feedback either before or after performing the task; results did not indicate any statistically significant difference regarding task quality due to timing of feedback, pre- or postsession. Further, participant preference was assessed during a choice phase in the study. Results revealed that, during the presession feedback, participants had a stronger preference to receive no feedback. Participants who received postsession feedback showed equal preference for all feedback statement sequences, with the exception of PCP (Henley & DiGennaro Reed, 2015). Unfortunately, Henley and DiGennaro Reed (2015) were not able to discern whether participants' choice was based on the feedback statement sequence or the nature of the task; each task was associated with one feedback statement sequence for each participant.

Sundberg (2015) conducted a similar study to investigate the effects of no feedback (control), the feedback sandwich, and information-only on task performance. Participants were instructed to perform a data-entry check-processing task where performance was evaluated according to the number of correct entries. An example of a feedback sandwich was: "Great job, you got 80 out of 82 checks processed this time, not quite as high as last time, but keep up the good work." An example of what was said during the information-only condition was: "You got 80 out of 82." These feedback statements provided the participants with both quantity and quality-related task feedback. Further, the sandwich sequence provided comparative feedback between the individual's previous and current performance. Similar to Henley and DiGennaro Reed (2015), Sundberg (2015) examined participants' preference for the different types of feedback. None of the three partici-

pants chose to receive the feedback sandwich during the choice phase; given the nature of the task was the same for all participants in all conditions, participants' preference during the choice condition can be linked to the type of feedback. The inclusion of the choice condition demonstrates that participants were able to discriminate among the experimental conditions. Though performance in the feedback sandwich and information-only conditions was higher than performance in the no feedback (control) condition, results indicated there was no significant difference in task performance between the two feedback conditions. This finding suggests that the objective data-based feedback provided in the information-only condition was the critical component of feedback, providing participants with information necessary to adjust future performance.

It is important to note that Henley and DiGennaro Reed (2015) and Sundberg (2015) were the first to *empirically* evaluate the impact of feedback statement sequence on the quality of task performance (Henley & DiGennaro Reed, 2015) and the quantity of task performance (Sundberg, 2015). The current study expands upon previous research to explore performance under the same four feedback statement sequences as Henley and DiGennaro Reed (2015): no feedback, PCP, CPP, and PPC. In addition, this research implements Sundberg's (2015) focus on quantity and quality-related performance feedback. The context of the research provides a setting in order to gain a clearer picture of the impact that feedback statement sequence involving quantity and quality-related feedback can have on performance toward a challenging goal.

Current Study and Hypotheses

Little empirical research exists to identify the most effective combination of positive and corrective feedback. Although research has repeatedly shown that specific and timely feedback combined with goals leads to increased performance, limited knowledge of the effects of feedback statement sequencing provides an opportunity for researchers. Results from the current study not only extend the feedback literature, but also have practical implications for individuals in a variety of professions. The purpose of this study was to examine the influence of feedback statement sequence on task performance when individuals are presented with a goal. Findings of this research allow for the identification of the most effective and preferred feedback statement sequence and aid in the development of guidelines for delivering effective performance feedback.

Hypothesis 1: Providing pretrial feedback tied specifically to a performance goal would increase an individual's performance.

Hypothesis 2: Providing feedback, regardless of sequence, would increase an individual's performance when working toward a goal more than providing no feedback.

Method

Participants

Participants were 36 undergraduate and graduate students at a Midwestern university. Participants' age ranged from 18 to 28 ($M = 19.63$, $SD = 2.09$) and 58% were male. The majority of participants were freshman (52.8%), followed by sophomores (22.2%), juniors (13.9%), seniors (5.6%), and other (5.6%); 83% identified as White, 8% as Asian, 3% as Black or African American, 3% as Black or African American and White, and 3% as other.

Recruitment methods included in-class announcements, flyers posted on campus, an online participant recruitment system, and an e-mail sent to undergraduate students. Participants were required to meet three criteria: (a) self-report that they played computer games for at least one hour each week and report interest in at least one of seven computers games listed on a questionnaire or use the Internet for at least 1 hr per week, (b) ability to attend all five research sessions in a 3-week period, and (c) had never participated in any other studies conducted by the first author and could not have taken or be currently enrolled in specific courses in which the topic of the effects of feedback and goals on work performance is thoroughly discussed (e.g., industrial/organizational psychology, personnel psychology, organizational psychology; organizational behavior management).

The first criterion was chosen to simulate the availability of attractive off-task activities in a workplace setting; reporting interest in the

available computer games or Internet use was required to ensure this criterion was met. In addition, the available computer games were the same or similar to those typically preinstalled on a computer (e.g., solitaire, minesweeper). The second criterion was required in an attempt to increase the saliency of the independent variable. Lastly, the third criterion was included because the effects of pay, goals, and feedback on work performance are taught in these courses, and knowledge of these effects could influence how participants respond in the current study. Participants were paid the minimum hourly wage established by the state in order to simulate a real work situation. This study required participants to attend multiple sessions; therefore, monetary compensation also aided in the reduction of attrition rates.

Informed consent was obtained from all participants, and the university's institutional review board approved all study methods and procedures.

Setting

The experimental setting consisted of a laboratory room containing two work areas separated by a large room divider. Upon entering the experimental setting, a work area for research assistants consisted of a worktable, office chairs, and storage cabinets for study materials. The work area for participants consisted of four computer workstations, each separated by tall panel dividers to create individual cubicles. Each participant workstation had a computer table (approximately 30″ w × 24″ d × 30″ h), Dell desktop computer, keyboard, mouse, gel palm rest, and an adjustable office chair.

Experimental Task and Alternative Activities

Experimental task. The experimental task consisted of a medical transcription data-entry task, a task designed to simulate the job of a medical data-entry clerk. The computer program provided participants with data corresponding to "patients." Participants first looked for the "Patient ID number" and typed it into the correct location (the blank "PATIENT ID" box). Then, they looked at whether the patient was male or female and based on the ranges provided for the respective gender, they determined whether the patient's data was "within range" or "outside of range" by clicking the appropriate button. When participants were satisfied with their responses, they clicked the "submit" button to close the current patient's record and generate the next patient record. Instructions were provided to participants at the beginning of each session and an example of the task was posted next to the computer workstation.

Alternative (off-task) activities. Seven computer games (Tetris, Hearts, Pinball, Solitaire, Spider Solitaire, FreeCell, and Minesweeper) were available on the computer, and participants had access to these games at all times during the experimental sessions. Instructions on how to play these games was available in the experimental room near the computer. Participants also had access to the Internet on the computer at all times during the experimental sessions. They were able to switch from the experimental task to the Internet or one of the computer games at any time during their sessions.

Procedures

Introductory session. The experimenter described the study and provided the consent document to potential participants. If consent was not obtained, individuals were paid $4.00 and dismissed. If consent was obtained, each participant's eligibility to continue was determined using a screening questionnaire. Participants who did not meet the eligibility requirements were paid and dismissed. Those who met the eligibility requirements were then instructed and shown how to complete the experimental task and given the opportunity to practice the task for 12 min. Participants were told that they would be paid $4.00 for the 30-min introductory session, and that they would receive this money after they completed their experimental sessions.

Pretest (no feedback/control) session. Participants attended a 60-min pretest session during which their rate of correct record completion per minute was assessed. The set-up for this session mimicked the experimental sessions and consisted of three 12-min work trials separated by 5-min break periods. Multiple work trials within a single session were used to (a) increase the saliency of the experimental conditions through repeated exposure within a sin-

gle session; (b) provide multiple opportunities for participants to self-evaluate performance and perceived goal-attainability; and (c) decrease potential for participant attrition by requiring fewer, overall, experimental sessions. Performance during the final (i.e., third) work trial was used to determine participants' task ability benchmark against which a goal was calculated.

Upon the completion of the pretest session, participants were asked to complete the Core Self-Evaluations Scale (CSES; Judge, Erez, Bono, & Thoresen, 2003; see Other Variables section for information about the CSES). While participants completed the CSES, the researcher reviewed the presession performance and calculated participants' assigned goal. The researcher provided participants with a form that identified the assigned goal that was used in all subsequent experimental sessions, and participants were asked to rate their perceived level of the goal's difficulty.

The pretest session also served as the no feedback (control) condition in this study, as participants did not receive performance feedback before beginning their work trials. Participants were told that they would be paid $8.00 for attending this session, and that they would receive this money after they completed their experimental sessions.

Experimental sessions. Participants attended three 60-min experimental sessions that consisted of three 12-min work trials separated by 5-min break periods. The requirement to complete three sessions was selected based on results from a previous study (Slowiak, 2015) that used the same medical data-entry task, which indicated most participants stabilize their performance on the task within three sessions. In addition, this requirement allows for repeated exposure to the assigned goal and the feedback statement sequence manipulations.

At the beginning of each session, participants were reminded how to complete the experimental task and that they could take breaks at any time during the session. After each 12-min work trial (except for the final work trial), the computer ended the task, and the researcher asked the participant to take a 5-min break. During this break period, the participant was asked to leave the workstation but remain in the lab until the next work trial began. While the participant was on break, the researcher reviewed the participant's performance on the task and prepared the correct feedback statement according to the feedback condition (PCP, PPC, or CPP) and the quality and quantity of the performance. Before the beginning of the next work trial, the researcher provided the participant with feedback, restarted the computer program, and asked the participant to resume working on the data-entry task. The computer program automatically ended the task at the end of each 12-min work trial, and the researcher entered the experimental work area to provide additional instructions to the participant.

Participants were given the option to either schedule each session on a different day or schedule a maximum of two sessions on a single day, with a 45-min break between the two sessions. Participants were told they would be paid $8.00 for each of the 60-min experimental sessions and that they would receive this money after they complete all experimental sessions.

Debriefing session. Immediately after their last experimental session, participants completed a poststudy questionnaire to obtain (a) demographic information; (b) participants' perception of the purpose of the study; (c) participants' awareness of the experimental procedures; (d) participants' self-reported goal-setting behavior; (e) participants' perception of the level of goal difficulty; and (f) participants' levels of satisfaction, stress, and goal commitment. Afterward, participants were given feedback on (a) the number of records they completed correctly during each session and (b) the total number of records they completed during the study. Participants were then debriefed regarding the purpose of the study, asked whether they had questions, and paid.

Payment. All participants were paid in the form of an Amazon e-gift card with a monetary value equivalent to the amount earned for their participation. For example, participants who attended all sessions (i.e., Introductory, Pretest, Experimental, and Debriefing) received a $40.00 Amazon e-gift card. This form of payment was disclosed to participants during the Introductory session, and all payments were provided at the end of individual participation in the study (i.e., at the end of the debriefing session). This procedure was used to control for any potential confounding effects of payment

and researcher praise as other sources of feedback.

Independent Variable

The independent variable was feedback statement sequence and included four conditions: (a) no feedback/control; (b) PCP (positive, corrective, positive statements); (c) CPP (corrective, positive, positive statements); and (d) PPC (positive, positive, corrective statements). Although other possible feedback statement sequence arrangements using corrective and positive statements exist, this study's focus was on the placement of a single corrective feedback statement amid two positive statements. The feedback statement sequences in this study represent all possible locations of the corrective statement in the sequence (i.e., first, middle, or last).

All participants received the no-feedback condition first, during the pretest session, in order to ensure a true control condition. Using a Partial-Latin Square randomization method, the order of exposure to each of the three feedback statement sequences was randomly assigned in order to alleviate carry over effects and assess practice effects (see the Experimental Design and Statistical Analyses section for the Partial-Latin Square model). A detailed description of all possible feedback statements and sequences is provided in Appendix A.

Performance feedback statement sequences focused on the quantity (number of data entries), quality (number of correct and incorrect data entries), and rate (number of correctly completed data entries per minute) of performance for the medical data-entry task. Slowiak (2015) noted that some participants who self-set goals to achieve 100% accuracy completed a lower overall quantity of records. On the other hand, some participants who self-set quantity-based goals made more data-entry errors.

In addition to creating multiple feedback statements for quality and quantity, two feedback statement sequences were created in the event that participants achieved their goal and (a) had at least one data entry error or (b) had no data entry errors. Though the use of differing forms of feedback statements was necessary in order to tailor feedback to each individual's performance, the delivery of feedback statements focused on progressing participants' performance. More specifically, feedback statements focused participants' attention on performing *effectively* (i.e., at the desired levels of quantity and quality) and then performing effectively at an increased level of *efficiency* (i.e., at a faster rate).

Feedback statements were provided to participants directly after their 5-min break and before the start of their next 12-min work trial (i.e., pretrial feedback). Procedurally, after a participant's first work trial, the participant took a break, returned to the computer workstation, and received feedback relative to their performance during work Trial 1. Immediately after receiving feedback, the participant began work Trial 2, followed by another break. Before the start of work Trial 3, participants received feedback relative to their performance during work Trial 2. At the end of work Trial 3, participants waited for the researcher to review their performance and received feedback before leaving the experimental session.

Constant Variable: Goals

Each participant received an individually tailored goal based on the total number of correctly completed records on the medical transcription data-entry task during their pretest session (no goal was in place during the pretest session). Goals, intended to be challenging and specifying the total number of correct records, were calculated at 30% above the participant's performance during the final (i.e., third) work trial. This ability-based criterion was determined based on Slowiak's (2015) finding that difficult, yet attainable goals set at 20% above an individual's pretest session performance were met by the majority of participants and perceived by participants as only somewhat difficult.

Dependent Variable: Task performance

The primary dependent variable associated with task performance was the number of correctly completed patient records, assessing the both quantity (number) and quality (accuracy) of performance. Data-entry rate, the average number of patient records completed per minute, was also measured in order to provide participants who achieved their goal with feedback that focused their attention on performing at a faster rate.

Other Variables

Additional measures were obtained to examine the influence that core self-evaluation, job satisfaction, goal commitment, and stress had on performance toward a goal when individuals were provided with various feedback statement sequences.

Core self-evaluation (CSE). CSE was assessed with the 12-item Core Self-Evaluations Scale *(CSES;* Judge et al., 2003) CSE is commonly assessed in research outside of behavior analysis and represents an individual's view of themselves, along with their perception of external factors (people, events, and things) in relation to oneself (Judge, Locke, & Durham, 1997). The CSES intends to measure the underlying self-evaluative factor that is present across the four traits of self-esteem, generalized self-efficacy, neuroticism, and locus of control. Research suggests that CSE influences goal setting and task performance (Erez & Judge, 2001), and that CSE is positively associated with job satisfaction (Judge, Locke, Durham, & Kluger, 1998). Responses to all items in this measure were made on a 5-point scale (1 = *strongly disagree*; 5 = *strongly agree*), with higher scores reflecting greater core self-evaluation. The authors reported adequate internal consistency estimates for the scale with a coefficient alpha of 0.846. Coefficient alpha in this study was 0.878. CSE, unlike other variables assessed in this study, was assessed after participants completed their pretest session in order to evaluate participants' appraisal of their ability to perform the data-entry task before exposure to performance feedback.

Job satisfaction. Job satisfaction was assessed using a three-item scale from the Michigan Organizational Assessment Questionnaire (MOAQ-JSS; Cammann, Fichman, Jenkins, & Klesh, 1979). The original scale was adapted by asking participants to assume they were to accept a permanent job performing the same task under the same conditions and then respond to the items. A sample item includes: "All in all, I would be satisfied with the job." Participants responded to the satisfaction items using a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The mean sample weighted internal consistency reliability for the MOAQ-JSS scale was 0.84 (k = 79, N = 30,623) and the mean sample-weighted test–retest reliability was .50 (k = 4, N = 746; Bowling & Hammond, 2008). Coefficient alpha in this study was 0.885, using three questions from the MOAQ-JSS.

Stress. Stress was assessed using six questions from a modified perceived stress scale (Kolb & Aiello, 1996). Participants rated each item on a semantic differential scale of 1 to 7, and stress scores were determined by adding together the individual ratings of the six items included on the poststudy questionnaire. A sample item includes: "What degree of stress did you experience while working on the data-entry task during the study?" The original scale had a Cronbach's alpha of 0.86; scores were computed for each subject by summing together responses on the 11 questionnaire items that measured perceived stress, after six items were reverse-scored (Kolb & Aiello, 1996). Coefficient alpha in this study was 0.866, using the modified version with six questions.

Goal commitment. Participants were given a seven-item questionnaire on goal commitment (Hollenbeck, Klein, O'Leary, & Wright, 1989). Each item was answered on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Goal commitment composite scores were calculated by using the average of the seven question responses. Five of the questions were reverse coded; higher scores reflect stronger goal commitment with lower scores representing lower goal commitment. Hollenbeck, Klein, O'Leary, and Wright (1989) state the coefficient alpha for this version of the scale was 0.80. Coefficient alpha in this study was 0.910.

Job satisfaction, stress, and goal commitment were assessed on the poststudy participant questionnaire.

Experimental Design and Statistical Analyses

This study used a within-subjects design to expose participants to four feedback conditions (no feedback and three feedback statement sequences). Previous research (Henley & DiGennaro Reed, 2015; Sundberg, 2015) presented no concerns regarding carryover effects when evaluating feedback statement sequence. Participants attended five sessions: introduction, a pretest session (no feedback/control), and three experimental sessions. Each experimental

session consisted of three 12-min work trials separated by 5-min break periods. Multiple work trials within each session increased participants' exposure to the independent variable and the goal, as well as provided a method to assess practice effects. To further control for potential treatment carry over effects, a Partial-Latin Square (see Figure 1) procedure was utilized in this study. All participants were exposed to the no feedback/control condition first, but the order of exposure to each of the three feedback statement sequences was randomly assigned.

Data were analyzed descriptively and inferentially using SPSS version 21.1. A repeated-measures analysis of variance (ANOVA) was used to evaluate within-subjects differences among feedback conditions and to determine the effects of feedback statement sequence on task performance.

Results

Results revealed an average increase of 18 correct data entries from the no-feedback condition (Session 1) across the three feedback conditions. Table 1 displays the mean task performance across all four testing sessions, and Table 2 displays the mean task performance within and across the four feedback statement sequences.

Test of Hypotheses

The first hypothesis was examined using a 4 (Feedback Condition) × 3 (Feedback Statement Sequence Order) within-subjects ANOVA to evaluate the effects of the four feedback conditions and the three feedback statement sequence orders on task performance. As shown in Figure 2, results indicate a statistically significant improvement between the no feedback/control session and the three feedback sessions, $F(3, 99) = 64.87$, $p < .001$, $\eta_p^2 = .663$. These results suggest that providing pretrial feedback in relation to a performance goal has a positive effect on performance (Hypothesis 1).

Hypothesis 2 was examined using a 3 (Trial) × 3 (Feedback Statement Sequence Order) within-subjects ANOVA evaluating the effects of the three within-session trials and the three feedback statement sequence orders on task performance. Participants were randomly assigned to one of three orders (designated as Order 1, 2, or 3) using a Partial-Latin Square randomization method to determine order of exposure to the three feedback statement sequences following the first (no feedback) session. Participants in Order 1 received the feedback order ABCD, Order 2 received ACDB, and Order 3 received ADBC; A = No Feedback, B = PPC Feedback Statement Sequence, C = PCP Feedback Statement Sequence, and D = CPP Feedback Statement Sequence.

Figure 3 illustrates a statistically significant improvement for within-session performance across the three trials in Session 1, $F(2, 66) = 11.53$, $p < .001$, $\eta_p^2 = .259$. Similarly, performance improved significantly across trials in Session 2, $F(2, 66) = 6.238$, $p = .003$, $\eta_p^2 = .159$ (see Appendix B, Figure B1). The following sessions did not show any significant interactions across trials, indicating participants' performance did not improve across trials for Session 3, $F(2, 66) = 0.910$, $p = .408$, $\eta_p^2 = .027$ (see Appendix B, Figure B2); or Session 4, $F(2, 66) = 1.170$, $p = .317$, $\eta_p^2 = .034$ (see Appendix B, Figure B3). Therefore, results support Hypothesis 2 showing that providing feedback regardless of sequence will increase individual performance when working toward a goal more than when providing no feedback.

A = Control Condition

B = PPC Sequence

C = PCP Sequence

D = CPP Sequence

A	B	C	D
A	C	D	B
A	D	B	C

Figure 1. Partial-Latin Square model.

Table 1
Summary of Means and Standard Deviations for Task Performance and Testing Position

	1		2		3		4	
Session	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
ABCD	70.00	15.44	83.25	18.34	87.75	20.28	91.83	20.89
ACDB	69.17	17.02	80.67	20.98	85.00	23.01	88.67	25.47
ADBC	72.58	14.54	87.50	17.89	92.83	23.58	98.42	26.52
M	70.58	15.67	83.81	19.07	88.53	22.29	92.97	24.29

Note. $n = 12$ within each order.

Manipulation Check: Assigned Performance Goals and Goal Difficulty

Slowiak (2015) stated some participants experienced confusion between their minimum performance standard necessary to obtain payment and their assigned performance goal. To assess participants' understanding of their assigned goal, participants were asked whether they were assigned a performance goal; if participants answered "yes" they were asked to describe their goal. Thirty-five of 36 participants understood that they were assigned a performance goal in addition to the minimum performance standard. Of those 35 participants, 33 correctly identified their specific goal (i.e., number of correct data entries), and two participants described how they were suppose to obtain the goal (i.e., correct entries in a certain amount of time). One participant reported that they were not assigned a performance goal.

Participants' goals were assigned with the intent to be challenging goals. Based on participants' pretest session performance, goals ranged from 62 and 145 correct data entries for each 12-min trial, with a mean of 97.56 (i.e., 98 correct data entries; $SD = 20.63$). Twenty-four of 36 (66.7%) participants met their assigned goal at least once out of a possible nine times across the three experimental sessions (three trials within each of the three sessions). Across the experimental sessions, six participants met their goal once, eight participants met their goal twice, one participant met their goal three times, four participants met their goal four times, one participant met their goal six times, two participants met their goal seven times, and two participants met their goal eight times.

The mean perceived level of goal difficulty before participants began their experimental sessions (i.e., before participants received feedback) was 3.42, $SD = 0.77$, indicating a perceived difficulty between 3 (*neutral*) and 4 (*easy*) on a 5-point scale ranging from 1 (*very difficult*) and 5 (*very easy).* Six (16.7%) participants reported their goal as 2 (*difficult*), nine (25%) selected 3 (*neutral*), and 21 (58.3%) participants reported their goal as 4 (*easy*). No participants identified their goal as 1 (*very difficult*) or 5 (*very easy*). Altogether, the majority of participants ($N = 30$; 83.3%) perceived their goals as 3 (*neutral*) or 4 (*easy*).

Table 2
Summary of Means and Standard Deviations for Task Performance and Feedback Statement Sequence

	No FB(A)		PPC (B)		PCP (C)		CPP (D)	
Order	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
ABCD	70.00	15.44	83.25	18.34	87.75	20.28	91.83	20.89
ACDB	69.17	17.02	88.67	25.47	80.67	20.98	85.00	23.01
ADBC	72.58	14.54	92.83	23.58	98.42	26.52	87.50	17.89
M	70.58	15.67	88.25	22.46	88.94	22.59	88.11	20.60

Note. $n = 12$ within each order.

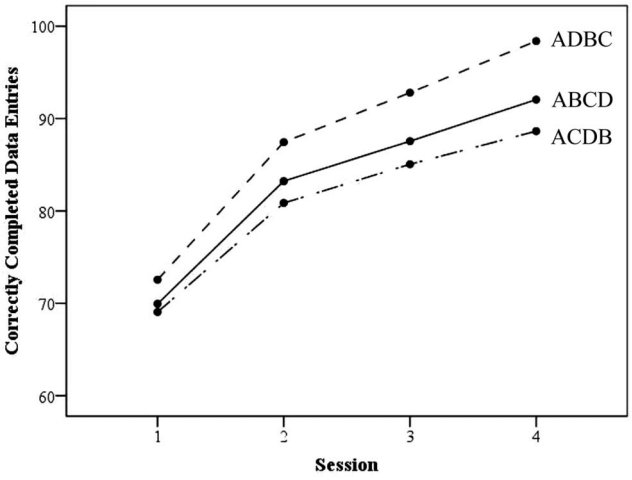

Figure 2. Task performance in all four experimental sessions across the exposure to order of the three feedback statement sequences (Session 1 = no feedback, Sessions 2–4 = feedback). Participants in Order 1 received the feedback order ABCD, Order 2 received ACDB, and Order 3 received ADBC; A = No Feedback, B = PPC, C = PCP, and D = CPP.

To determine whether participants' perception of goal difficulty changed, participants were asked to categorize the level of perceived goal difficulty on the poststudy questionnaire. The mean perceived poststudy level of goal difficulty was 2.28 (SD = 0.82), indicating that participants felt the goal was 2 (*somewhat difficult, moderate*) or 3 (*difficult, challenging, yet attainable*). Only two (5.6%) participants selected 4 (*very difficult, challenging and difficult to attain or unattainable*), 12 (33.3%) participants choose 3 (*difficult, challenging, yet attainable*), 16 (44.4%) participants indicated 2 (*somewhat difficult, moderate*), and six (16.7%) participants selected 1 (*not difficult at all, easy*). This finding indicates a possible discrepancy

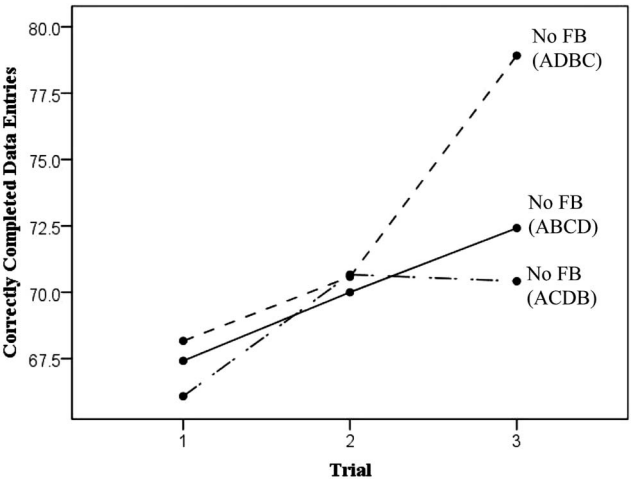

Figure 3. Task Performance in Session 1 (no feedback) across the exposure to order of the three feedback statement sequences. Participants in Order 1 received the feedback order ABCD, Order 2 received ACDB, and Order 3 received ADBC; A = No Feedback, B = PPC, C = PCP, and D = CPP.

between individuals' perceived level of goal difficulty and the "real" level of goal difficulty, based on participants' performance and frequency of goal achievement across all opportunities. Twenty-four (66.7%) participants reached the assigned goal at least one out of nine times; only two participants reached their goal eight times. No participant reached their assigned goal all nine times. Based on participants' frequency of goal attainment, more accurate ratings of perceived goal difficulty would have been 3 (*difficult, challenging, yet attainable*) or 4 (*very difficult, challenging and difficult to attain or unattainable*).

Ad Hoc Analyses

Additional ad hoc analyses were conducted to examine how CSE, job satisfaction, goal commitment, and stress influenced task performance when participants were presented with an assigned goal. Table 3 displays the mean and standard deviations for the additional measures and overall task performance.

As noted in Table 4, which shows the intercorrelations between ad hoc variables, there is a statistically significant relationship between goal commitment and overall task performance. This positive relationship supports the assumption that as goal commitment increases so will the individuals task performance.

Participant Feedback Statement Sequence Preference

During the poststudy questionnaire, participants were asked to rank the four sessions, each associated with one of the four feedback conditions, from 1 (*most preferred*) to 4 (*least preferred*). The session in which participants received the CPP feedback statement sequence was ranked first by 17 (47%) participants, the PCP session was ranked first by nine participants, the PPC session was ranked first by six participants, and the No Feedback session was ranked first by two participants. One participant stated that they could not tell the difference among the feedback sessions, and one participant did not understand the question.

Further analysis was conducted on the participants who selected CPP as their preferred feedback statement sequence. Results showed that nine participants who were exposed to feedback according to the ABCD order (Order 1; CPP delivered during Session 4), five who were exposed to feedback according to the ACDB order (Order 2; CPP delivered during Session 3), and three who were exposed to feedback according to ADBC order (Order 3; CPP delivered during Session 2) ranked the CPP session as most preferred. Given that a subset of participants from all three feedback orders (i.e., ABCD, ACDB, and ADBC) preferred to receive feedback in the CPP sequence despite the order in which they received it, an additional analysis was run to determine whether participants' selection of CPP as their preferred feedback statement sequence was associated with goal achievement during that session. Of the 17 participants who selected CPP, 10 did reach their goal (ABCD: 5, ACDB: 3, ADBC: 2) and seven did not reach their goal (ABCD: 4, ACDB: 2, ADBC: 1).

After participants ranked their preferred feedback statement sequences, they were asked "Did the feedback provided by the researcher have corrective and positive statements related

Table 3
Summary of Means and Standard Deviations for CSE, Job Satisfaction, Goal Commitment, Stress, and Overall Task Performance

Measures	*M (SD)*	Potential range of scores
1. Core self-evaluation (CSE)	3.73 (.63)	1–5
2. Job satisfaction	2.37 (1.05)	1–5
3. Goal commitment	3.67 (.91)	1–5
4. Stress	11.72 (5.71)	1–42
5. Overall task performance	83.97 (19.33)	0–no range restriction

Note. $n = 36$. Higher scores on all measures indicate higher levels of CSE, job satisfaction, goal commitment, stress, and task performance.

Table 4
Summary of Intercorrelations for Scores on CSE, Job Satisfaction, Goal Commitment, Stress, and Overall Task Performance

Measure	CSE	JS	GC	Stress
1. CSE				
2. JS	−.01			
3. GC	.28	.21		
4. Stress	−.20	−.03	−.32	
5. Overall task performance	.23	.24	.53**	−.19

Note. CSE = core self-evaluation score; JS = job satisfaction score; GC = goal commitment score. Overall task performance was assessed by averaging participant performance from all four sessions.
** $p < .01$.

to your task performance? Please circle Yes or No." If participants circled "yes" they were asked if they preferred positive or corrective statements. All 36 participants selected "yes" to indicate that they received positive and corrective feedback statements during their experimental sessions. Nineteen (52.8%) preferred positive statements, nine (25%) selected corrective statements, and eight (22.2%) participants had no preference.

Discussion

Results from the present study demonstrate the positive effects of feedback to improve task performance and support previous research (Ilgen et al., 1979; Sundberg, 2015) and recommendations in literature to use feedback as a low-cost and efficient performance improvement strategy (Daniels & Daniels, 2006; Prue & Fairbank, 1981). This study intentionally compared the feedback sandwich sequence, PCP, with two other feedback statement sequences to see if the placement of a single corrective statement influenced task performance. All feedback statement sequences in this study included objective (quantity and quality) performance statements related to a single data-entry work task. Results revealed no statistically significant difference among the different feedback statement sequences. These findings suggest that, when all statements relate to the same work task, the *placement* of a corrective statement (e.g., first, middle, or end of sequence) may not be a critical consideration when using feedback to evoke an increase in performance related to that task. The critical component, despite statement sequence, might simply be the objective data/information within the statements that provides participants with information necessary to adjust future performance. This contention supports Sundberg's (2015) finding that participants performed similarly when given PCP feedback and to basic, objective performance information.

Another explanation for the lack of differential effects might relate to the focus of the feedback statement sequence on a single and/or relatively simple work task, such as the data-entry tasks used in the present study and by Sundberg (2015). In practice, it is reasonable to imagine that managers would discuss and provide feedback related to one or more job-related tasks during a single meeting. Moreover, a manager might use feedback statement sequences, such as the PCP, in such a way that the corrective and positive feedback statements refer to different tasks altogether or to multiple facets of a larger, more complex project. Thus, research to empirically assess the impact and effects of feedback statement sequences used to provide feedback on multiple or multifaceted tasks and performances is warranted. Henley and DiGennaro Reed (2015) found the CPP feedback statement sequence had a greater impact on quality-focused tasks compared to the PCP and PPC feedback statement sequences, supporting the contention that impact of the placement of the corrective statement may depend, in part, on the nature of task.

Zachary (2012) suggested that mentors provide feedback in the form of positive-positive-positive-corrective (PPPC). Results from the present study support the focus on positive feedback statements (52.8% of participants indicated an overall preference for positive vs. corrective feedback); however, preference for having the corrective statement at the end of the sequence was not supported. Self-report data revealed that participants preferred the CPP feedback statement sequence, even though it did not improve their performance compared with PCP and PPC feedback statement sequences. A possible explanation is that participants in the present study selected CPP as their preferred feedback due to the recency of hearing the positive statements at the end of the sequence, thereby considering the overall feedback statement sequence as positive. Participants' ranking

of the PCP sequence as their second preferred feedback statement sequence may lend some support to Sundberg's (2015) finding that none of the participants selected to receive PCP feedback when given a choice.

Strengths and Implications

To date, empirical research has failed to support that a specific type of feedback statement sequence is best suited to improve performance for a performance-based or analog task. Although no statistically significant evidence for a specific feedback statement sequence exists, researchers advocate for the PCP sequence, stating it is more effective and preferred than other types of feedback (Berger, 2013; Nelson & Quick, 2013), despite findings that indicate employee preference to receive corrective feedback, by itself (Schwarz, 2013; Von Bergen et al., 2014) and arguments that the importance of the corrective feedback might be "lost" when provided alongside positive feedback (Daniels, 2009; Tjan, 2012).

Although many forms and sequences exist for providing feedback, it is, perhaps, most important to simply provide performance feedback. Though results of this study revealed no statistically significant difference in task performance among the three feedback statement sequences (PCP, CPP, or PPC), results do suggest that participants preferred to hear feedback delivered in the CPP sequence. Given the varied preference for feedback statement sequences found in this study and in related research (Henley & DiGennaro Reed, 2015; Sundberg, 2015), feedback deliverers may want to consider developing open lines of communication in order to determine how feedback recipients prefer to receive both positive and corrective performance-based feedback. Within the field of behavior analysis, a common recommendation for individuals who provide feedback and other consequences is to build rapport with and get to know clients' or recipients' preferences for a variety of reinforcers (Daniels & Bailey, 2014; McGee & Johnson, 2015). Positive performance feedback may function as a conditioned reinforcer for the desired behavior; therefore, identifying individual preference for the receipt of this type of feedback may be beneficial to increase its effect (Johnson, 2013; Slowiak, Dickinson, & Huitema, 2011). As such, the individuals providing feedback could use the recipient's likes and dislikes to help structure the feedback conversation and insert positive and corrective statements as necessary.

Bandura's (1978) research on social learning theory suggests that the discrepancy between an individual's actual performance and their goal (when identified through feedback) may serve as a motivator (i.e., a motivating establishing operation) for an increase in performance effort. Participants indicated on their poststudy questionnaire that they enjoyed hearing their performance compared to their assigned goal. When possible, a recommendation for feedback providers is to incorporate an individual's performance toward their goal when providing specific, objective, and evaluative feedback.

Limitations and Future Research

The calculation and assignment of challenging goals continues to be a limitation and area of improvement for future research. Slowiak (2015) assigned "challenging" goals at 20% above the participant's baseline performance. Due to the large number of participants from her study who rated their "challenging" goal as *easy*, the current study set participant challenging goals at 30% above their baseline performance. Examination of whether the goal was a challenging goal, as intended, revealed that 24 of the 36 (66.7%) participants met their assigned goal at least one time out of nine possible times during the study. Future research should examine methods for assignment or calculation of challenging goals to lower the probability of goal attainment.

Further, poststudy questionnaire results from this study showed there may have been a discrepancy between participants' perception of goal difficulty and their attainment of the goal. Only 19 (53%) participants met their goal four or fewer times (out of a possible nine); therefore, participants were expected to rate their goal as either 3 (*difficult, challenging, yet attainable*) or 4 (*very difficult, challenging and difficult to attain or unattainable*). However, the majority of participants (61.1%) selected 2 (*somewhat difficult, moderate*) or 1 (*not difficult at all, easy*). If the assigned performance goal were a 2 (*somewhat difficult, moderate*), the likelihood of goal attainment throughout the study would be expected to be higher. Future

research should investigate the relationship (or discrepancy) between the participant's "perception" of their assigned performance goal and the "reality" or achievement of their assigned performance goal.

Participants' composite goal commitment scores varied from 1.71 (*strongly disagree*) to 4.86 (*strongly agree*), indicating that some participants may not have been genuinely committed to the performance task or assigned goal. Further, participants reported they were not very satisfied with the task. Although job satisfaction scores were low, participants did have above average CSE scores. Previous research has shown that individuals with higher CSE scores are motivated to seek positive feedback from their jobs in order to maintain their high level of CSE (Wu & Griffin, 2012). Wu and Griffin (2012) found that, over time, CSE can fluctuate due to work experiences (e.g., job satisfaction or organizational commitment) and self-motives. These results support the contention that participants with higher CSE scores who seek feedback to maintain their current level of CSE would strive to attain their assigned performance goal and meet the minimum performance standards. However, due to the low ratings of job satisfaction and fluctuating goal commitment scores in this study, future research should investigate the potential impact of feedback statement sequences with a different performance task or environment (i.e., education, coaching, or work setting).

References

Agnew, J. L. (1998). The establishing operation in organizational behavior management. *Journal of Organizational Behavior Management, 18,* 7–19. http://dx.doi.org/10.1300/J075v18n01_02

Alavosius, M. P., & Sulzer-Azaroff, B. (1986). The effects of performance feedback on the safety of client lifting and transfer. *Journal of Applied Behavior Analysis, 19,* 261–267. http://dx.doi.org/10.1901/jaba.1986.19-261

Alvero, A. M., Bucklin, B. R., & Austin, J. (2001). An objective review of the effectiveness and essential characteristics of performance feedback in organizational settings. *Journal of Organizational Behavior Management, 21,* 3–29. http://dx.doi.org/10.1300/J075v21n01_02

Balcazar, F., Hopkins, B. L., & Suarez, Y. (1985). A critical, objective review of performance feedback. *Journal of Organizational Behavior Management, 7,* 65–89. http://dx.doi.org/10.1300/J075v07n03_05

Balcazar, F. E., Shupert, M. K., Daniels, A. E., Mawhinney, T. C., & Hopkins, B. L. (1989). An objective review and analysis of ten years of publication in the journal of organizational behavior management. *Journal of Organizational Behavior Management, 10,* 7–37. http://dx.doi.org/10.1300/J075v10n01_02

Bandura, A. (1978). The self system in reciprocal determinism. *American Psychologist, 33,* 344–358. http://dx.doi.org/10.1037/0003-066X.33.4.344

Bandura, A., & Cervone, D. (1983). Self-evaluative and self-efficacy mechanisms governing the motivational effects of goal systems. *Journal of Personality and Social Psychology, 45,* 1017–1028. http://dx.doi.org/10.1037/0022-3514.45.5.1017

Bateman, M., & Ludwig, T. (2003). Managing distribution quality through an adapted incentive program with tiered goals and feedback. *Journal of Organizational Behavior Management, 23,* 33–55. http://dx.doi.org/10.1300/J075v23n01_03

Becker, L. (1978). Joint effect of feedback and goal setting on performance: A field study of residential energy conservation. *Journal of Applied Psychology, 63,* 428–433. http://dx.doi.org/10.1037/0021-9010.63.4.428

Berger, J. (2013). *INSTANT MBA: When giving feedback, give criticism between two positives*. Retrieved from http://www.businessinsider.com/feedback-between-two-positives-2013-6

Bowling, N. A., & Hammond, G. D. (2008). A meta-analytic examination of the construct validity of the Michigan Organizational Assessment Questionnaire Job Satisfaction subscale. *Journal of Vocational Behavior, 73,* 63–77. http://dx.doi.org/10.1016/j.jvb.2008.01.004

Cammann, C., Fichman, M., Jenkins, D., & Klesh, J. (1979). *The Michigan Organizational Assessment Questionnaire*. Unpublished manuscript, University of Michigan, Ann Arbor, MI.

Chow, C. W., Lindquist, T. M., & Wu, A. (2001). National culture and the implementation of high-stretch performance standards: An exploratory study. *Behavioral Research in Accounting, 13,* 85–109. http://dx.doi.org/10.2308/bria.2001.13.1.85

Daniels, A. C. (2009). *Oops! 13 management practices that waste time and money (and what to do instead)*. Atlanta, GA: Performance Management Publications.

Daniels, A. C., & Bailey, J. S. (2014). *Performance management: Changing behavior that drives organizational effectiveness*. Atlanta, GA: Performance Management Publications.

Daniels, A. C., & Daniels, J. E. (2006). *Performance management*. Atlanta, GA: Performance Management Publications.

Davies, D., & Jacobs, A. (1985). "Sandwiching" complex interpersonal feedback. *Small Group Behavior, 16,* 387–396. http://dx.doi.org/10.1177/0090552685163008

Dohrenwend, A. (2002). Serving up the feedback sandwich. *Family Practice Management, 9,* 43–46.

Duncan, P. K., & Bruwelheide, L. R. (1985). Feedback: Use and possible behavioral functions. *Journal of Organizational Behavior Management, 7*(3-4), 91–114. http://dx.doi.org/10.1300/J075v07n03_06

Erez, A., & Judge, T. A. (2001). Relationship of core self-evaluations to goal setting, motivation, and performance. *Journal of Applied Psychology, 86,* 1270–1279. http://dx.doi.org/10.1037/0021-9010.86.6.1270

Fellner, D. J., & Sulzer-Azaroff, B. (1984). A behavioral analysis of goal setting. *Journal of Organizational Behavior Management, 6,* 33–51. http://dx.doi.org/10.1300/J075v06n01_03

Fisher, J., Peffer, S., & Sprinkle, G. (2003). Budget-based contracts, budget levels, and group performance. *Journal of Management Accounting Research, 15,* 51–74. http://dx.doi.org/10.2308/jmar.2003.15.1.51

Hanson, B. (n.d.). *Delivering feedback to your athletes*. Retrieved from http://www.athleteassessments.com/articles/coach_feedback_to_athletes.html

Henley, A. J., & DiGennaro Reed, F. D. (2015). Should you order the feedback sandwich? Efficacy of feedback sequence and timing. *Journal of Organizational Behavior Management, 35,* 321–335. http://dx.doi.org/10.1080/01608061.2015.1093057

Hollenbeck, J. R., Klein, H. J., O'Leary, A. M., & Wright, P. M. (1989). Investigation of the construct validity of a self-report measure of goal commitment. *Journal of Applied Psychology, 74,* 951–956. http://dx.doi.org/10.1037/0021-9010.74.6.951

Houmanfar, R. (2013). Performance feedback: From component analysis to application. *Journal of Organizational Behavior Management, 33,* 85–162. http://dx.doi.org/10.1080/01608061.2013.787002

Ilgen, D. R., & Davis, C. (2000). Bearing bad news: Reactions to negative performance feedback. *Applied Psychology, 49,* 550–565. http://dx.doi.org/10.1111/1464-0597.00031

Ilgen, D. R., Fisher, C. D., & Taylor, M. S. (1979). Consequences of individual feedback on behavior in organizations. *Journal of Applied Psychology, 64,* 349–371. http://dx.doi.org/10.1037/0021-9010.64.4.349

James, T., & Shephard, B. (2001). *Presenting magically*. Wales, UK: Crown House Publishing.

Jeffrey, S. A., Schulz, A., & Webb, A. (2012). The performance effects of an ability-base approach to goal assignment. *Journal of Organizational Behavior Management, 32,* 221–241. http://dx.doi.org/10.1080/01608061.2012.698116

Johnson, D. A. (2013). A component analysis of the impact of evaluative and objective feedback on performance. *Journal of Organizational Behavior Management, 33,* 89–103. http://dx.doi.org/10.1080/01608061.2013.785879

Judge, T. A., Erez, A., Bono, J. E., & Thoresen, C. J. (2003). The core self-evaluations scale (CSES): Development of a measure. *Personnel Psychology, 56,* 303–331. http://dx.doi.org/10.1111/j.1744-6570.2003.tb00152.x

Judge, T. A., Locke, E. A., & Durham, C. C. (1997). The dispositional causes of job satisfaction: A core evaluations approach. *Research in Organizational Behavior, 19,* 151–188.

Judge, T. A., Locke, E. A., Durham, C. C., & Kluger, A. N. (1998). Dispositional effects on job and life satisfaction: The role of core evaluations. *Journal of Applied Psychology, 83,* 17–34. http://dx.doi.org/10.1037/0021-9010.83.1.17

Kolb, K. J., & Aiello, J. R. (1996). The effects of electronic performance monitoring on stress: Locus of control as a moderator variable. *Computers in Human Behavior, 12,* 407–423. http://dx.doi.org/10.1016/0747-5632(96)00016-7

Lee, T. W., Locke, E. A., & Phan, S. H. (1997). Explaining the assigned goal-incentive interaction: The role of self-efficacy and personal goals. *Journal of Management, 23,* 541–559. http://dx.doi.org/10.1177/014920639702300403

Locke, E. A. (1968). Toward a theory of task motivation and incentives. *Organizational Behavior and Human Decision Processes, 3,* 157–189. http://dx.doi.org/10.1016/0030-5073(68)90004-4

Locke, E. A. (2004). Linking goals to monetary incentives. *The Academy of Management Executive, 18,* 130–133. http://dx.doi.org/10.5465/AME.2004.15268732

Locke, E. A., Chah, D., Harrison, S., & Lustgarten, N. (1989). Separating the effects of goal specificity from goal level. *Organizational Behavior and Human Performance, 43,* 270–287. http://dx.doi.org/10.1016/0749-5978(89)90053-8

Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation. A 35-year odyssey. *American Psychologist, 57,* 705–717. http://dx.doi.org/10.1037/0003-066X.57.9.705

Locke, E. A., & Latham, G. P. (2013). Goal setting theory. In E. A. Locke & G. P. Latham (Eds.), *New developments in goal setting and task performance* (pp. 3–15). New York, NY: Routledge.

Locke, E. A., Shaw, K. N., Saari, L. M., & Latham, G. P. (1981). Goal setting and task performance: 1969–1980. *Psychological Bulletin, 90,* 125–152. http://dx.doi.org/10.1037/0033-2909.90.1.125

Ludwig, T. D., & Geller, E. S. (1991). Improving the driving practices of pizza deliverers: Response generalization and moderating effects of driving history. *Journal of Applied Behavior Analysis, 24,* 31–44. http://dx.doi.org/10.1901/jaba.1991.24-31

Mangiapanello, K. A., & Hemmes, N. S. (2015). *An analysis of feedback from a behavior analytic perspective*. Portage, MI: Association for Behavior Analysis International.

McGee, H. M., & Johnson, D. A. (2015). Performance motivation as the behaviorist views it. *Performance Improvement, 54,* 15–21. http://dx.doi.org/10.1002/pfi.21472

Morrison, E. W., & Weldon, E. (1990). The impact of an assigned performance goal on feedback seeking behavior. *Human Performance, 3,* 37–50. http://dx.doi.org/10.1207/s15327043hup0301_3

Mowen, J. C., Middlemist, D. R., & Luther, D. (1981). Joint effects of assigned goal level and incentive structure on task performance: A laboratory study. *Journal of Applied Psychology, 66,* 598–603. http://dx.doi.org/10.1037/0021-9010.66.5.598

Nelson, D. L., & Quick, J. C. (2013). *Organizational behavior: Science, the real world, and you* (8th ed.). Mason, OH: South-Western.

Nolan, T. V., Jarema, K. A., & Austin, J. (1999). An objective review of the *Journal of Organizational Behavior Management*: 1987–1997. *Journal of Organizational Behavior Management, 19,* 83–114. http://dx.doi.org/10.1300/J075v19n03_09

Ordonez, L. D., Schweitzer, M. E., Galinsky, A. D., & Bazerman, M. H. (2009). Goals gone wild: The systematic side effects of overprescribing goal setting. *The Academy of Management Perspectives, 23,* 6–16. http://dx.doi.org/10.5465/AMP.2009.37007999

Peterson, N. (1982). Feedback is not a new principle of behavior. *The Behavior Analyst, 5,* 101–102.

Prue, D. M., & Fairbank, J. A. (1981). Performance feedback in organizational behavior management. *Journal of Organizational Behavior Management, 3,* 1–16. http://dx.doi.org/10.1300/J075v03n01_01

Schwarz, R. (2013, April 19). *The "sandwich approach" undermines your feedback* [Web log post]. Retrieved from https://hbr.org/2013/04/the-sandwich-approach-undermin

Slowiak, J. M. (2015). *The effects of computer monitoring, feedback medium, and goals on work performance, feedback seeking, job satisfaction, and stress*. Unpublished manuscript, Department of Psychology, University of Minnesota Duluth, Duluth, MN .

Slowiak, J. M., Dickinson, A. M., & Huitema, B. E. (2011). Self-solicited feedback: Effects of hourly pay and individual monetary incentive pay. *Journal of Organizational Behavior Management, 31,* 3–20. http://dx.doi.org/10.1080/01608061.2011.541816

Sulzer-Azaroff, B., & de Santamaria, M. C. (1980). Industrial safety hazard reduction through performance feedback. *Journal of Applied Behavior Analysis, 13,* 287–295. http://dx.doi.org/10.1901/jaba.1980.13-287

Sundberg, D. (2015). *An empirical analysis of the sandwich method of feedback* (Unpublished master's thesis). Florida Institute of Technology, Melbourne FL.

Tjan, A. K. (2012, November 14). Have the courage to be direct [web log post]. *Harvard Business Review*. Retrieved from https://hbr.org/2012/11/have-the-courage-to-be-direct.html

Von Bergen, C. W., Bressler, S. M., & Campbell, K. (2014). The sandwich feedback method: Not very tasty. *Journal of Behavioral Studies in Business, 7,* 1–13.

Wright, P. M. (1989). Test of the mediating role of goals in the incentive-performance relationship. *Journal of Applied Psychology, 74,* 699–705.

Wu, C. H., & Griffin, M. A. (2012). Longitudinal relationships between core self-evaluations and job satisfaction. *Journal of Applied Psychology, 97,* 331–342. http://dx.doi.org/10.1037/a0025673

Zachary, I. J. (2012). *The mentors guide: Facilitating effective learning relationships*. San Francisco, CA: Jossey-Bass.

Zhang, Z., & Jia, M. (2013). How can companies decrease the disruptive effects of stretch goals? The moderating role of interpersonal- and informational-justice climates. *Human Relations, 66,* 993–1020. http://dx.doi.org/10.1177/0018726713483630

(*Appendices follow*)

Appendix A

Experimenter Feedback Script

No Feedback Condition: No response provided to participant.

CPP Condition:

Corrective: "Your correct entries was _____ and your goal was ____."

Specific Positive: "I like that you reached _____ data entries!"

General Positive: "You are doing a great job, keep up the good work."

Full Statement: "Your correct entries was _____ and your goal was ____. I like that you reached ____ data entries! You are doing a great job keep up the good work."

PPC Condition:

Specific Positive: "Good job, you got ___ out of ___ data entries this time."

General Positive: "Keep up the good work!"

Corrective: "Next time, try to (complete more or) work a little quicker."

Full Statement: "Good job, you got ___ out of ___ data entries this time, keep up the good work! Next time, try to work a little quicker."

PCP Condition:

Specific Positive: "Good job, you got ___ out of ___ data entries this time."

Corrective: "Not quite as high (or as fast) as last time (tailored from previous performance)."

General Positive: "Keep up the good work."

Full Statement: "Good job, you got ___ out of ___ data entries this time, not quite as high as last time (tailored from previous performance), but keep up the good work."

Because participant scores can vary, corrective statements will focus on accuracy and speed of task performance. Previous results from analog tasks report that some participants focus on attaining perfect accuracy (no mistakes); however, this may decrease their speed of data-entry. Therefore, statements are generic and can be easily altered depending on the participant and their speed and accuracy during the Medical Data-Entry Task.

Option 1: IF they *reached the quantity goal but had errors,* say:

"Your correct entries was _____ and your goal was ____. However, you had _____ errors. Next time, try to make less errors."

Option 2: IF they *reached the quantity goal and had NO errors,* say:

"Your correct entries was _____ and your goal was ____. Nice job at reaching your goal! Next time, "Try to increase your rate of correct data-entry."

(*Appendices continue*)

Appendix B

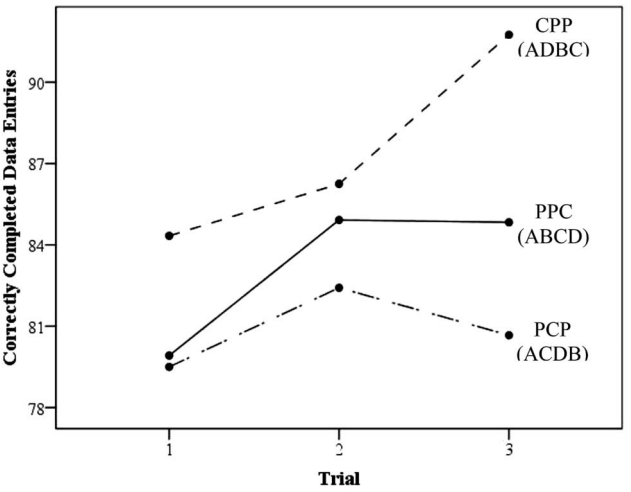

Figure B1. Task performance across feedback orders in Session 2. Task performance in Session 2 across the exposure to order of three feedback statement sequences. Participants in Order 1 received the feedback order ABCD, Order 2 received ACDB, and Order 3 received ADBC; A = No Feedback, B = PPC, C = PCP, and D = CPP.

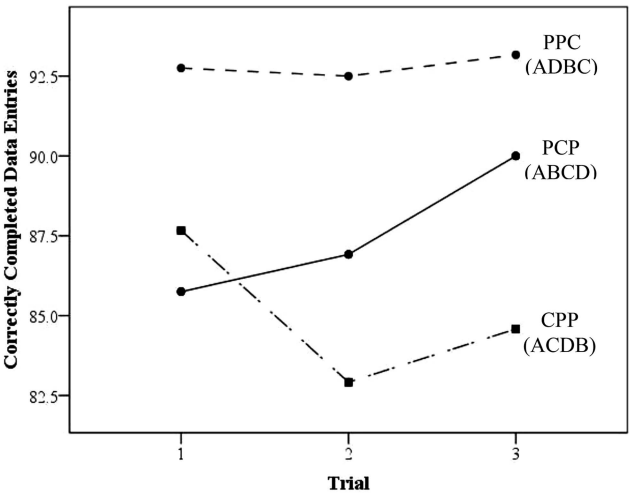

Figure B2. Task Performance across Feedback Orders in Session 3. Task performance in Session 3 across the exposure to order of three feedback statement sequences. Participants in Order 1 received the feedback order ABCD, Order 2 received ACDB, and Order 3 received ADBC; A = No Feedback, B = PPC, C = PCP, and D = CPP.

(*Appendices continue*)

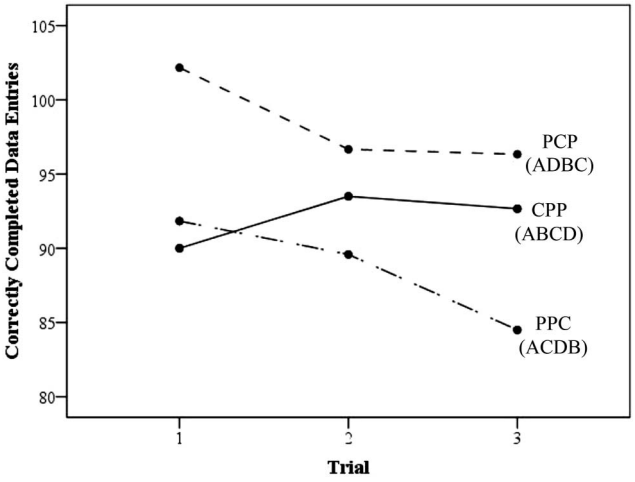

Figure B3. Task Performance across Feedback Orders in Session 4. Task performance in Session 4 across the exposure to order of the three feedback statement sequences. Participants in Order 1 received the feedback order ABCD, Order 2 received ACDB, and Order 3 received ADBC; A = No Feedback, B = PPC, C = PCP, and D = CPP.

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