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doi: <https://doi.org/10.57709/17366348>

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*Developmental Feedback, Ability, and Employee Effort in a Multitask Environment*

BY

*Alice M. Muncy*

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree

Of

Doctor of Philosophy

In the Robinson College of Business

Of

Georgia State University

GEORGIA STATE UNIVERSITY  
ROBINSON COLLEGE OF BUSINESS  
2020

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2020

## ACCEPTANCE

This dissertation was prepared under the direction of the *Alice Muncy's* Dissertation Committee. It has been approved and accepted by all members of that committee, and it has been accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Business Administration in the J. Mack Robinson College of Business of Georgia State University.

Richard Phillips, Dean

## DISSERTATION COMMITTEE

Dr. Ivo Tafkov (co-chair)  
Dr. Jeremy Lill (co-chair)  
Dr. Michael Majerczyk  
Dr. Anne Farrell (external)

ABSTRACT

*Developmental Feedback, Ability, and Employee Effort in a Multitask Environment*

BY

*Alice M. Muncy*

*April 1, 2020*

Committee Chair: *Ivo Tafkov, Jeremy Lill*

Major Academic Unit: *School of Accountancy*

This study explores whether employee responses to developmental feedback in a multitask setting differ when feedback focus on the task which is an employee's relative strength (strength-congruent) or weakness (weakness-congruent), and whether employee response depends on whether the task is relatively more effort or ability driven. In a multitask setting, developmental feedback can be used to focus future employee efforts on one task over another. Using an experiment, I find that strength-congruent feedback on a more ability-driven task leads to a greater allocation of time to the task than when strength-congruent feedback is given on a more effort-driven task, or when weakness-congruent feedback is given. However, within the time spent on the task, I find greater performance improvement on the ability-driven task regardless of whether feedback is strength-congruent or weakness-congruent. This study broadens our understanding of the multitask environment and how employees allocate effort in the presence of communicated firm preferences.

## **ACKNOWLEDGEMENT**

I would like to thank my committee members, Jeremy Lill, Ivo Tafkov, Michael Majerczyk and Anne Farrell for their guidance and support. I would like to thank the workshop participants at Baylor University for their comments and suggestions. Additionally, I would like to thank my fellow Ph.D. students for their help with the pilot and providing valuable feedback on the instrument. I would also like to thank the brownbag participants at Georgia State University, Suyun Wu and the participants at the GRACE conference for their insightful comments and suggestions. Last, I would like to thank my family for their unwavering love and support. Without them none of this would have been possible.

## I. INTRODUCTION

Firms frequently give employees feedback which is used to review past performance and offer direction on where future improvements would be beneficial. In practice, companies often use a type of feedback referred to as developmental feedback (Zhou 2003). This feedback emphasizes developing skills for future growth rather than solely evaluating past performance. Still, one challenge managers face is deciding what tasks may benefit the most from developmental feedback. Within a single job, several tasks may benefit from focused development. However, improvement is limited by the amount of time and cognitive resources an employee can devote towards developing each task. Thus, the organization needs to determine which task benefits most from developmental feedback. An important aspect of this decision is whether to focus on a task which is the employee's relative strength or relative weakness (Aguinis et al. 2012; Zenger and Folkman 2014). Focusing on a strength can improve an employee's comparative advantage, whereas focusing on a weakness can improve an employee's competency across all tasks. In this study I explore how employee response to developmental feedback differs when it focuses on a relative strength versus a relative weakness, and whether task type moderates this relationship.

I examine this relationship in a multitask environment. Multitask environments are ones in which employees must perform multiple tasks within one job or allocate effort across multiple dimensions of a single task (Holmstrom and Milgrom 1991). In this environment organizations often struggle with how to effectively communicate where an employee should spend their time and efforts (Brandts and Cooper 2007). Often, compensation controls, such as incentive pay, are used to direct employee effort towards tasks which are more highly incentivized (Holmstrom and Milgrom 1991). However, compensation controls have disadvantages; they are costly and

difficult to change once they have been implemented. Developmental feedback is a less costly and more flexible way to direct employee effort (Brandts and Cooper 2007). Because of this, many firms have implemented some type of feedback control system (Lorenzet et al. 2006). This study aims to understand how features of feedback and the task jointly influence employee effort in a multitask environment.

Within a multitask environment, tasks often differ in the level of effort and ability they require. These tasks may be conceptualized along a continuum from tasks which require relatively more effort versus ability to those that require relatively more ability versus effort. Characteristics of an effort task are that it is more controllable by the employee and mundane, while an ability task is less controllable and more intrinsically rewarding (Dugan 1989; Butler 1987). I explore whether, given multiple tasks in the same job, developmental feedback influences whether an employee focuses on the relatively more effort or ability driven task.

I first examine how developmental feedback on one task influences the duration of effort applied towards that task. Employees are more likely to allocate effort towards a task if they believe that doing so will lead to better future performance (Weiner 1972; Kanfer and Ackerman 1989; Lam et al. 2008). I contend that developmental feedback which focuses on an employee's strength raises their belief that additional effort will lead to increased performance. This strength-congruent feedback increases the employee's willingness to focus on the task, which leads to a longer duration of effort. Additionally, strength-congruent feedback on an ability task enhances self-efficacy and motivation because it conveys a strong message of personal competence (Lam et al. 2008). Therefore, strength-congruent feedback on an ability driven task may influence an employee to allocate more time towards it, compared to strength-congruent feedback on an effort task. In contrast, weakness-congruent feedback does not have a positive effect on effort



allocation, because it decreases their belief that additional effort will lead to greater performance. This occurs both when given weakness-congruent feedback on an effort or an ability driven task. Therefore, I predict that effort duration will be longer when feedback is strength-congruent as opposed to weakness-congruent, and that effort duration will be greatest when given strength-congruent feedback on the more ability-driven task.

I then develop a hypothesis related to performance within the time allocated towards the given task. One task feature which likely influences effort intensity is whether performance on the task is primarily driven by effort or ability. Doing well at an ability task leads to greater pride and fulfillment than doing well at an effort task (Butler 1987). This motivates employees to work harder to improve their performance on an ability-driven task compared to an effort-driven task. Thus, I predict that those given strength-congruent feedback on an ability-driven task will improve their performance more than those given strength-congruent feedback on an effort-driven task. I also predict that weakness-congruent feedback will lead to a similar result. Effort-driven tasks are more controllable by the employee and thus may be easier to improve on (Weiner 1972). However, failure at an ability-driven task is detrimental to one's self-confidence because workers do not want to appear to have low ability (Butler and Neuman 1995). Thus, I predict that in order to avoid the connotation of having low ability, workers given weakness-congruent feedback on an ability-driven task will improve their performance more than weakness-congruent feedback on an effort-driven task.<sup>1</sup>

I use a laboratory experiment to test these predictions. Participants, acting as employees for an organization, work on two tasks, one more effort-driven and one more ability-driven.

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<sup>1</sup> Note, this is not without tension. While workers may intend to improve performance more on an ability task, the nature of the task makes this more difficult. Ability driven tasks are less controllable than effort driven tasks, and so there is no guarantee that additional motivation will lead to greater performance improvements. Thus, I acknowledge that a boundary condition exists for which workers are more motivated to improve performance but unable to do so.

These tasks are calibrated so that around half of the participants are better at one compared to the other. Participants work on each task for four minutes. When round one is complete, participants receive outcome feedback. Additionally, they receive developmental feedback informing them on which task they should focus moving forward. I manipulate *Feedback Congruity* by either telling them to focus on the task which they did better on compared to the other task (strength-congruent) or the task that they did worse on compared to the other task (weakness-congruent). *Task Focus* is measured as the task (effort or ability) on which they receive developmental feedback. In the second round, participants decide how to allocate one-minute increments of time to work on each task, with a total of nine minutes to allocate across the two tasks. They then complete the second round, finish the experiment and receive their compensation. Participants are compensated using a flat wage. My dependent variables are the amount of time allocated to each task, as well as round two performance.

Results are consistent with my predictions. I find participants who receive feedback congruent with their strength allocate more time to the task they are given developmental feedback on, but only when this is an ability-driven task. Additionally, I find performance on the task increases to a greater extent when developmental feedback focuses on a more ability-driven task, than when it focuses on an effort-driven task. Surprisingly, this is true both when the developmental feedback is congruent with a worker's strength, and when it is incongruent. In other words, this occurs both when the ability-driven task is a strength, and when it is a weakness, as long as the developmental feedback suggests they should focus on the ability-driven task. Additional supplemental analyses seem to suggest that those given strength-congruent feedback and weakness-congruent feedback have different reasons for improving their performance.

This study has a number of important implications for theory and practice. First, it suggests that feedback can serve as a potential low-cost alternative to implementing different levels of pay-for-performance across different tasks to direct employee effort. Additionally, this study builds on the accounting literature on communication in a multitask or multidimensional task environment. Prior research examines how communication of relative performance information, performance targets, and causal linkages affects effort allocations in multitask and multidimensional environments (Hannan et al. 2019; Farrell et al. 2012; Hannan et al. 2013; Brügger et al. 2018). My study investigates how explicit communication of organizational preferences for the future, paired with feedback on prior performance, influence these allocations. Notably, this study gives insight into the process employees use when deciding how to comply with a firm's communicated preferences.

My study also adds to the current discussion in academic and practitioner literature on the value of feedback which focuses on weaknesses (Ashford and Northcraft 2003; Vancouver and Tischner 2004; Finkelstein and Fishbach 2011; Van Dijk and Kluger 2011; Weidinger et al. 2016; Lechermeier and Fassnacht 2018). Research indicates that employees want clear, understandable feedback on their weaknesses (Zenger and Folkman 2014). Indeed, this feedback can help to improve employee performance, stop unwanted behavior, and encourage goal pursuit (Finkelstein and Fishbach 2011). However, managers are still hesitant to give negative feedback, citing decreased morale, increased employee stress, and employee disengagement as primary factors for their reticence (Ashford and Northcraft 2003; Weidinger et al. 2016). My study suggests that forward looking feedback on a weakness may improve performance, and that this is magnified when the developmental feedback focuses on ability-driven tasks.

Last, my study adds to psychology literature on task characteristics which affect

feedback. While this has long been assumed to have some influence on the response to feedback valence, relatively little research has studied it (Lechermeier and Fassnacht 2018). Interestingly, I find that the nature of the task affects both the employee's choice and subsequent behavioral responses to feedback. Specifically, I find that when workers are instructed to focus on an ability-driven task, they only choose to spend additional time on the task when it is a strength. However, regardless of whether the ability driven task is a strength or weakness, workers instructed to focus on the ability driven task experience a greater performance increase than workers instructed to focus on the more effort driven task. While this adds to the literature, it has practical implications as well. This indicates that managers can expect different responses to developmental feedback, based on whether the task focused upon is more effort or ability driven. This can help managers to make a more informed decision on where their feedback will be useful, given the goals of the organization.

The rest of this paper is as follows: section II contains my background and hypotheses, section III contains my methodology, section IV contains my results, and section V concludes.

## **II. BACKGROUND AND HYPOTHESES**

### ***Developmental Feedback***

To facilitate employee growth, organizations often use feedback which is oriented towards directing future behavior. This feedback is referred to as developmental feedback. Overall, it is primarily used to focus an employee's future efforts and only incorporates past performance to inform employees of how to improve in the future (Zhou 2003). This feedback can be broken down into two parts, (a) the outcome of prior performance, and (b) guidance on future actions (Zhou 2003). For example, an accounts receivable manager may indicate that a clerk should focus on improving their days outstanding ratio to ensure timely receipts. While the

feedback contains information about past performance, i.e, the prior days outstanding ratio, the focus is on what to do in the future.

Developmental feedback is widely used in practice (Zhou 2003), however it is still an emerging area of research. One field study indicates that it increases the effort duration and intensity a new employee allocates towards their task (Li et al. 2011). Additionally, research suggests that developmental feedback reduces turnover intention, increases creativity, and promotes group cohesion (Zhou 2003, Joo, Hahn and Peterson 2015). There are many examples of developmental feedback in practice. In the popular press, one article reads: “Developmental feedback goes beyond simply telling an employee what he or she did well and badly. It focuses on areas of improvement with the goal of developing his or her skills rather than simply evaluating performance.” (trainingindustry.com) Another adds that “The evaluation (grades) should be used as a platform for development: The grade is X and the action plan is Y. The grade is the evaluative piece, and the action plan is the developmental one.” (Richardson.com)

Organizations can provide workers with developmental feedback which focuses on either an employee's relative strength or weakness. What determines whether a task is a strength or a weakness may be made through relative performance information, such as how well an employee is doing compared to other employees, or some absolute measures. An example of an absolute measure would be a call center which has a standard number of phone calls made per hour, and based on the number of phone calls the employee makes, their phone call time may be a strength or a weakness.

Some employees may benefit from feedback on their strengths, while others may benefit from feedback on their weaknesses. Organizations can ask the employee to focus on a task they perform particularly well at relative to other tasks. This gives the employee an opportunity to

polish their strength in an area which they already show talent. Similarly, organizations can focus an employee on a task they are relatively weak at, in hopes creating a more balanced worker. This is particularly important in environments where mistakes are especially costly, and thus focusing on poor performance is crucial.

Both strengths and weaknesses could be a focus of developmental feedback in the evaluation process. Therefore, I examine whether developmental feedback which is congruent with an employee's strength or weakness influences effort allocations in a multitask environment. Often, feedback which focuses on weaknesses can lead to negative emotions and cause workers to disengage from their task (Ashford and Northcraft 2003). Because of its future orientation, some theorize that the influence of developmental feedback will not lead to disengagement, and rather motivate employees to improve future performance (Li et al. 2011). However, little empirical research has been done to test this claim.

### ***The Multitask Environment***

In the multitask environment, tasks compete for time and cognitive resources, and workers must decide how to allocate effort on each task (Ashford and Northcraft 2003). Accounting research in the multitask and multidimensional task environment has primarily studied two types of controls which influence worker effort allocations. These approaches can be categorized as the use of incentives (Fehr and Schmidt 2004; Brügger and Moers 2007; Kachelmeier et al. 2008; Hecht et al. 2012; Christ et al. 2016), and the use of information provided by the firm (Hannan et al. 2019; Farrell et al. 2012; Hannan et al. 2013; Christ et al. 2016; Brügger et al. 2018). These studies indicate that some firm-provided information, such as targets, helps workers understand how they should allocate resources between types of tasks (Brügger et al. 2018). However, other studies indicate that some information, such as relative

performance information, may encourage employees to allocate resources in such a way that it is a detriment to overall performance (Hannan et al. 2019; Hannan et al. 2013). Thus, the type of information provided by the firm likely has an impact on employee effort allocations.

### ***The Continuum of Effort and Ability***

Most tasks can be conceptualized along a continuum from relatively more effort driven to relatively more ability driven (Weiner 1972). One significant difference between effort and ability driven tasks is their level of controllability (Weiner 1972; Dugan 1989). Effort is considered a controllable aspect of performance. The expectation is that one can decide how much effort to exert in a given scenario. In this way, the individual is in control of their level of effort. An effort-driven task is one in which performance is largely based on the amount of effort exerted on the task. Resource-based accounts define efforts in terms of the “expenditure,” “investment,” “consumption,” “allocation,” or “depletion” of energy or resources in order to reach one’s goals: “The construct of effort can be defined as the mobilization of resource to carry out behavior” (Massin 2017). Effort-driven tasks require some expenditure of the self-regulatory control of the individual performing the task. In this way, effort-driven tasks are more tedious and less intrinsically motivating than ability-driven tasks (Brüggen and Strobel 2007; Engelmann et al. 2009). Thus, I conceptualize relatively higher effort-driven tasks as being tasks on which performance is more controllable in the short term and requires the depletion of self-regulatory resources in order to complete.

On the other hand, performance on an ability task is considered to be a trait variable which is uncontrollable in the short term (Weiner 1972). Additionally, while ability tasks are costly in terms of the mental resources needed to complete the task, these tasks are also more intrinsically rewarding (Cervone and Wood 1995; Lam et al. 2008) and thus require less self-

regulation to complete. According to the PASS theory of intelligence, tasks which require higher ability are more cognitively demanding because they require an individual to be able to plan, focus attention, and process information simultaneously and successively than tasks requiring less ability (Naglieri and Das 1990). Thus, I conceptualize relatively higher ability-driven tasks as tasks on which performance is less controllable in the short term and require more mental resources to complete.

Research indicates that in a multitask setting, effort is often multi-dimensional. (Larson and Callahan 1990; Ashford and Northcraft 2003; Brügger and Moers 2007). Specifically, effort consists of both an effort level choice and an effort allocation choice (Brügger and Moers 2007). In this study, I develop hypotheses related to these two aspects of effort. I conceptualize effort duration as the amount of time allocated towards a task, and performance as the effort level choice applied while working on the task.

### ***Hypotheses Development***

#### *The Effect of Developmental Feedback on Effort Duration*

I examine the duration of effort workers are willing to allocate to a task, given the type of developmental feedback they receive. I predict that employees will allocate more time when developmental feedback is congruent with their strength rather than when it is congruent with their weakness, and when strength-congruent feedback focuses on a more ability-driven task compared to an effort-driven task. Strength-congruent feedback will increase employee allocation of effort for several reasons. As research indicates, positive feedback increases employee intrinsic motivation and desire to work on the task (Ilies et al. 2007). Additionally, the organization's stated priorities will be aligned with the employee's intrinsic motivation. Thus,



those who receive developmental feedback focused on their strength will have the desire to engage more on that task.

When given strength-congruent feedback, workers will choose to allocate more time to an ability driven task, compared to the more effort-driven one. This is because success at this task positively impacts their self-concept (Lam et al. 2008). Good performance on an ability task brings with it a sense of achievement which is stronger than good performance on an effort-driven task. Added to this, feedback strengthens this positive impact. Strength-congruent feedback on an ability task enhances self-efficacy and motivation because it indicates that the worker is competent at the task (Lam et al. 2008). Perceived competency ultimately leads to the ability task being more intrinsically motivating than the effort driven task (Butler 1987). When people act out of intrinsic motivation, they find fulfillment in those activities and enjoy doing them (Ryan and Deci, 2000). Because workers enjoy the task more, they are more likely to want to allocate time towards the task.

In contrast, I posit that employees will not allocate as much time on the task when given weakness-congruent developmental feedback as when given strength-congruent feedback. Workers have a limited amount of time, which requires them to regulate how much time to allocate between tasks. While the feedback identifies an area the worker should improve on, the worker may not want to focus all of their time on that task. Instead, they must balance the marginal value of improvement on their weak task, with the higher probability of success at their stronger task. While increasing performance on the weaker task is congruent with organizational goals, it is compatible with the goals of the individual merely in its ability to influence the worker's self-concept (Ashford and Northcraft 2003).<sup>2</sup> Thus, if the worker perceives that

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<sup>2</sup> In the absence of external rewards or punishments

continued success the other task will have a greater positive impact on their self-concept, this will decrease the attention they are willing to allocate towards their weaker task. This will be similar for both the effort and ability tasks because this feedback focuses on a weakness rather than a strength. Thus, I hypothesize that workers who receive weakness-congruent feedback will choose to allocate less time towards the task emphasized by the feedback than those given strength-congruent feedback.

In sum, I predict that strength-congruent feedback *increases* the desire to engage in the task emphasized, and this is greater for the ability-driven task than for effort-driven tasks. However, weakness-congruent feedback does not have the same attention focusing effect that strength-congruent feedback has. Thus, employees given developmental feedback focused on their strength will allocate more effort towards that task than employees who receive developmental feedback focuses on their weakness, and this relationship will be stronger when strength-congruent feedback is given on a more ability-driven task than when strength-congruent feedback is given on a more effort-driven task. Stated formally;

*H1a: Workers' effort duration will be more consistent with developmental feedback when the feedback is congruent with the worker's strength relative to when it is congruent with their weakness.*

*H1b: When given feedback which is congruent with the worker's strength, workers' effort duration will be more consistent with developmental feedback when the feedback focuses on an ability-driven task, relative to when it focuses on an effort-driven task.*

## *The Effect of Developmental Feedback on Performance*

I also examine whether worker performance differs when workers are given developmental feedback on a more effort-driven or more ability-driven task. I hypothesize that performance will be higher when developmental feedback is given on the ability-driven task, regardless of whether this feedback is congruent with a worker's strength or weakness. However, the motivation for this performance will differ between strength-congruent and weakness-congruent states. When feedback is congruent with a strength, effort intensity will be higher on the ability-driven task than the effort-driven task because of internal motivation. When an employee does well, research indicates that this success at an ability-driven task leads to greater pride and fulfillment than success at an effort-driven task (Butler 1987). Furthermore, continued high performance on this task indicates greater ability (Lam et al. 2008). Additionally, workers who do well at an ability-driven task may value greater improvement simply because it is more intrinsically rewarding (Butler 1987). That is, they simply enjoy working on the task. They then choose to attempt to improve performance rather than maintain current effort levels.

On the other hand, maintaining attention towards an effort-driven task is more costly in terms of self-regulatory resources than maintaining attention to an ability-driven task (Cervone and Wood 1995). It is more difficult to pay attention to monotonous, cognitively unchallenging tasks than it is to pay attention to cognitively challenging but interesting tasks (Cervone and Wood 1995). This creates an imbalance between the cost of sustaining effort towards the task and the benefit of completing the task (Langner and Eickhoff 2013). Thus, when given strength-congruent feedback on an effort-driven task, workers most likely choose to maintain current levels of effort, rather than attempting to increase their performance.

When feedback is weakness-congruent, I posit that effort intensity will be higher on the

ability-driven task rather than the effort-driven task because of external motivations. When developmental feedback indicates an employee should focus on an ability-driven task, they will do so in order to avoid the appearance of failure at an ability-driven task. Performance at ability tasks requires higher levels planning, focus, and information processing (Naglieri and Das 1990). These traits are important factors which drive self-esteem estimations (Ackerman and Wolman, 2007). Research indicates that most people want to avoid failing at an ability-driven task, because this indicates that they are a person of low ability (Nicholls 1984). Doing poorly at an ability-driven task hurts one self-esteem more than doing poorly at an effort driven task (Nicholls 1978; Nicholls 1984; Sorensen and Franks 1972). This in turn leads to lower self-confidence, and a need to rectify the situation through increased performance (Wilson and Benner 1971). Thus, when developmental feedback indicates that they should improve performance in this area, workers are eager to show that they can do well at this task. While this task is less controllable than an effort-driven task, employees will still put increased effort towards it in order to increase their chances of doing well.<sup>3</sup>

Conversely, when developmental feedback indicates that a worker should improve their performance on the effort-driven task, there is not as much of an incentive to do so. For one, the worker is not threatened by lower self-esteem. While improvement on the task is controllable, increased performance on this task does not have as great of impact on the employee's self-concept. While improvement on the ability task proves that they have the qualities necessary to do well at the task, improvement on the effort task only shows that they can work harder.

Furthermore, additional improvement costs more in terms of the self-regulatory resources needed

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<sup>3</sup> This only holds true when the task is reasonably able to be improved upon. If improvement is not possible, then the more likely scenario is that the worker gives up. However, I make the argument that within an organizational setting, there is a reasonable assumption that a base level of ability exists which can be improved upon. Otherwise the firm would likely part ways with the employee.

to complete the task. However, research indicates that doing poorly on an effort task shows laziness (Dugan 1989). Thus, workers may still put some effort into the task in order to not appear lazy. Thus, workers may take the strategy of doing as little as they believe is possible while still fulfilling organizational expectations.

In sum, these theories suggest that performance improvement is more valued on an ability-driven task rather than an effort-driven task. Thus, when developmental feedback informs a worker to focus on an ability-driven task they will exert higher effort intensity than those told to focus on an effort-driven task. When the ability-driven task is strength congruent, this is due in part to the task being more enjoyable, however when this is weakness-congruent, it is likely due to self-esteem concerns. Thus, my hypothesis is as follows;

*H2: Workers will increase their performance more when developmental feedback focuses on an ability-driven task rather than an effort-driven task.*

### **III. METHODOLOGY**

#### ***Overview***

To test my predictions, I run an experiment with a 2 x 2 between-subjects design. In my study, participants sequentially work on an effort-based letter search task and an ability-based word search task for 4 minutes each.<sup>4</sup> When both tasks are complete, they receive feedback on their performance in round 1, and developmental feedback on which task they should focus on in round 2. Participants then choose how much time in round 2 to spend on each task, by allocating a total of nine minutes between the two tasks in increments of 1 minute. They then complete

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<sup>4</sup> Both tasks were performed in this order in all conditions. This was done to keep everything consistent between conditions. Additionally, some might say that there are fatigue affects which are present in one condition and not the other. This does not differ between conditions and thus should not influence inferences which can be made from the results.

round 2, answer postexperiment questions, and receive their compensation, which is a \$10 flat pay.

### ***Experimental Tasks***

Participants work on two tasks throughout the experiment. Both tasks are an alphabet-based puzzle task consisting of searching for something within a grid of letters. In the first task, workers search for letters, in the second they search for words.<sup>5</sup> I chose these two tasks because although they appear similar, they are different in terms of the effort and ability needed to do well at them. The similarity of these tasks increases internal validity because there are fewer aspects of the task which differ from one another. However, this also works against me finding results.

The first task is the letter search task in which workers are presented with a 10 x 10 letter grid. Workers are given a letter and must count how many times it appears in the grid. If they answer correctly, they move on to the next puzzle. If they answer incorrectly, they are forced to wait 10 seconds before providing another answer.<sup>6</sup> Workers performance on this task is measured by how many letter search puzzles they correctly solve. Performance on this task is relatively more effort-based compared to the second task. Workers can do well on this task without outside knowledge or innate skill. Their performance is controllable, and workers can conclude that their performance is contingent on how hard they worked on this task and that increased effort will lead to better results.

The second task is the word search task. Workers are presented with a 10 x 10 grid of

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<sup>5</sup> While these tasks are on the continuum of effort/ability, both tasks are relatively more effort driven, given the spectrum of real-world tasks. Thus, when I refer to the word search task as being relatively more ability driven this is in reference to the letter search task rather than the entire spectrum of real-world tasks. While this is a weaker manipulation of effort and ability, the similarity of the tasks provides greater internal validity.

<sup>6</sup> This design choice was made to ensure participants do not make random guesses about the correct number of letters in the puzzle.

letters that contains three hidden words placed either vertically or horizontally in the grid. Workers must find one of the three words and correctly type it into the entry box before continuing to the next puzzle. These words are not provided to the participants. Thus, participants must have the ability to recall words while simultaneously analyzing letters and placing them into a sequential process in order to form the correct word. Incorrect guesses are not penalized in this task.<sup>7</sup> Workers are also given the option of skipping puzzles, however if they choose to skip, they must wait 10 seconds before moving on to the next puzzle. Performance on this task is measured by how many word search puzzles are correctly solved. Because this task requires both sequential and simultaneous processing, this task is considered more ability based relative to the letter search task.<sup>8</sup> Examples of the tasks are found in figures 2A and 2B.

<Insert Figure 2A and 2B>

### ***Developmental Feedback***

In the instructions, participants are told to consider themselves in the role of an employee within an organizational setting for the duration of this study. They are also informed that before round 2, the organization will provide guidance on which task the organization believes is most important for them to focus on.

Between rounds 1 and 2, workers receive both outcome feedback on the number of puzzles they solved on each task, and developmental feedback telling them which task they

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<sup>7</sup> Because each word contains 5 letters, it would be highly unlikely for participants to be able to randomly guess a correct word. This is unlike the letter search in which participants could make guesses until they got the number of letters correct.

<sup>8</sup> In order to recognize a correct word, workers must simultaneously recognize English words while also relating this to the letters in the grid and placing them in order. Because of this, workers can conclude that their performance on this task is a function of both how hard they worked, and their innate ability to recognize English words hidden in a grid of letters. Thus, increased effort may not necessarily lead to a comparable increase in performance.

should focus on in the future. To ascertain the participant's understanding of the outcome feedback, they are asked which task they performed better(worse) at, before moving on to the next piece of feedback. The developmental feedback consists of instructions which ask the worker to focus on one of the two tasks. Specifically, it tells the worker to focus on the task they performed better at, or the task they performed worse at. I call this *Feedback Congruity*, in which developmental feedback is considered strength-congruent if it asks the worker to focus on the task the worker's scored higher on, and weakness-congruent if it asks the worker to focus on the task the worker scored lower on. My second variable is *Task Focus*, which is measured by whether developmental feedback focuses on the effort-based letter search task (*effort-focus*) or the ability-based word search task (*ability-focus*). This variable is determined by whether the participant was randomly assigned to the *strength(weakness)-congruent* condition, and by which task they did better or worse on (*effort/ability task*). Before moving on to the next stage, participants were asked a question to ascertain their understanding of the feedback received. In order to get a similar number of participants who were better at one task relative to the other, I first ran a small pilot. This was to ensure that, on average, the same number of puzzles were solved across both tasks, and that a similar number of participants were in better at the ability and effort tasks. Figure 3 contains an example of both the outcome feedback and developmental feedback received. Participants then work on the tasks for the allocated time. When they have completed round 2, they are informed of their performance in that round. They then continue to the post-experimental questionnaire. Finally, they receive a flat payment of \$10 in private. My primary dependent variables are *Feedback Consistent Duration*, which is the amount of time spent on the developmental feedback specified task, and *Feedback Consistent Performance Improvement*, which is the change in performance in round 2 on the task emphasized by the



developmental feedback.

<Insert Figure 3>

### *Design Choices*

There are a few design choices which warrant further discussion. First, it is important for workers to believe that their performance on one task relative to the other is based on characteristics innate to themselves rather than environmental characteristics. Because my research question focuses on a workers own effort and ability at a task, and task type, I did not want participants to think that the reason for their performance was either random chance or the experimenter giving them a harder puzzle set than other participants. To facilitate this, participants are given instructions which say “While the tasks have been calibrated so that, on average, the number of problems solved is the same for both tasks, you may find that you do better on one task relative to the other.” This is a critical design feature to ensure that from the onset, participants do not have the expectation that one task is innately more difficult than the other. Thus, provided feedback which reflects either positively or negatively on their performance, workers will infer something about their own ability and effort at the task rather than the environment.

Second, workers are paid a fixed amount rather than being paid for the number of puzzles they solved. I made this design choice because when developmental feedback is weakness-congruent, the incentives would work against the feedback so that participants would want to work on the task which paid them more rather than task which the developmental feedback focused on. Equally, when developmental feedback is strength-congruent, incentives and feedback would be aligned, so I would be unable to determine if the feedback was responsible for their choice, or if it were the incentives. This would threaten internal validity because I would

not be able to ascertain whether workers chose to work on a task due to behavioral factors or monetary ones. Because incentives would work for one condition and against the other, the feedback congruity conditions would not be comparable. Furthermore, there are many situations in organizations in which incentives are not provided on a task-by-task basis (Baker, Jensen, and Murphy 1988; Hannan et al. 2013.) Therefore, I do not believe that this design choice limits generalizability.

Last, there were several types of tasks I could have used to create the multitask environment. I chose the letter and word search tasks for a few reasons. While I wanted to manipulate the level of ability required by the task, I did not want prior perceptions of the task to play a large role. Thus, I chose to stay away from using mathematical and grammar related tasks. Participants already have an idea of whether they are better at math or grammar and this could influence their perceptions of the tasks as being more effort or ability driven. However, I did not want to use a task which was so abstract that participants attributed performance to aspects of the environment rather than their own effort or ability. Because of that, I did not want to use two very similar tasks and manipulate the probability of success. While this would satisfy the concept of self-efficacy being the belief that additional effort would lead to additional results, the attribution would be to the environment rather than to the individual. This is an important distinction to make because if the cause is deemed to be environmental then future performance could not be attributed to the effort or ability of the participant.

## **IV. RESULTS**

### ***Summary Statistics***

The study was run with students in the lab at a large southeastern university using the computerized software Z-tree (Fischbacher 2007). All conditions were run simultaneously in

each session. There were 101 participants. The average age of the participants is 20.1 years old, and 67% are female.<sup>9</sup> Table 1 presents the number of letter and word searches solved by round and condition.

<Insert Table 1>

### ***Allocation of Time to Tasks Emphasized by Feedback***

My first hypothesis examines the role that developmental feedback has on the effort duration. H1a predicts that workers will allocate time more consistently with developmental feedback if it focuses on the strength-congruent task, while H1b predicts an interaction between the task focused upon and the feedback received. To test this, I create a variable called *Feedback Consistent Duration*, which is the amount of time allocated towards the task focused on by the feedback. My independent variables are *Feedback Congruity*, which indicates whether the feedback is congruent to the worker's strength (*Strength-Congruent*) or weakness (*Weakness-Congruent*), and *Task Focus*, which indicates whether the developmental feedback is focused on the ability task (word search) or the effort task (letter search). Figure 4, Panel 1 and Table 2 shows the mean amount of time allocated towards the development consistent task in each condition. On average, those in the *strength-congruent* condition allocated 6.10 minutes when the ability task was focused upon, and 4.97 when the effort task was focused upon. In the *weakness-congruent* condition, this was 4.52 and 4.57 respectively.

<Insert Figure 4>

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<sup>9</sup> 12 participants were dropped from the analysis due to having solved an equal number of word and letter puzzles in round 1. Because one of my IVs focuses on whether someone does better or worse at one of the tasks, the data for these 12 observations would not be easily interpreted.

I then run an ANOVA using *Feedback Congruity* and *Task Focus* as the independent variables, and *Feedback Consistent Duration* as the dependent variable. Results are reported in Panel B of Table 2. To summarize, consistent with H1a and H1b, there is a main effect of feedback congruity on performance ( $F=11.26$ ,  $p < 0.01$ ), as well as an interaction between *Feedback Congruity* and *Task Focus*. ( $F= 3.34$ ,  $p = 0.07$ ). Additional analysis indicates that these results are primarily driven by workers given *strength-congruent* feedback on the ability task (*ability*-6.1 vs. *effort* 4.97). An analysis of the simple effects indicates that those with strength-congruent feedback who were told to focus on the ability task allocated more time compared to those told to focus on the effort task ( $F = 7.54$ ,  $p < 0.01$ ). This is consistent with my hypotheses. It also indicates that those in the *strength-congruent* effort condition still allocated slightly less than half their time to the *ability-driven* task. I speculate that this is because the ability driven task is viewed as less tedious and more enjoyable than the effort task, and this plays out in my supplemental analyses.

In sum, those with *strength-congruent* feedback allocated more time to the task emphasized by the developmental feedback, particularly when the ability task was emphasized. Additionally, I note that workers in the *weakness-congruent* condition still allocate slightly over half the time allowed towards the feedback consistent task. Overall, this result indicates that workers intend to direct effort consistently with developmental feedback. That is, workers do not completely ignore *weakness-congruent* feedback, even though there is no incentive for them to comply with it. However, when given *strength-congruent* feedback, there is a clear preference for allocating time towards the ability task. This is consistent with ability tasks being more intrinsically rewarding (Nicholls 1984).

<Insert Table 2>

### *Change in Performance on Tasks Emphasized by Feedback*

My second hypothesis examines how the change in performance in round 2 is affected by the developmental feedback given after round 1. Hypothesis 2 predicts a main effect of the task type on change in performance. Specifically, that workers will improve more on the ability-driven task compared to the effort-driven task when developmental feedback focus is either *strength-congruent* or *weakness-congruent*. To test this, I focus on performance within the allocated time. I calculate the scaled performance using the difference in the number of word (letter) search puzzles solved in rounds 1 and 2, divided by the amount of time allocated to the task in round 2. I then create a variable called *Feedback Consistent Performance Improvement*, which is the improvement on the task which developmental feedback asks workers to focus on.

I run an ANOVA on *Feedback Consistent Performance Improvement* using *Feedback Congruity* and *Task Focus* as the independent variables. As shown in Panels A and B of Table 3, I find a main effect of *Feedback Congruity* ( $F=2.53$   $p<0.06$  one tailed) and *Task Focus* ( $F=6.35$   $p<0.01$ ). This is consistent with hypothesis 2.

<Insert Table 3>

Overall, I find support for my hypotheses. These results indicate that focusing on the ability task leads to a greater increase in performance than focusing on the effort task. Additionally, while workers intend to follow developmental feedback and duly allocate almost half the time to the worse task, those who are given feedback on the ability task have a greater performance increase than those told to focus on the effort driven task.

### *Supplemental Analyses*

In order to examine the processes behind my findings, I do a number of additional analyses. My hypotheses argue that the response to feedback will change based on whether an ability or effort task is emphasized, and whether a strength or weakness is emphasized. My first set of additional analyses examine whether participants viewed the word search task as requiring more ability than the effort search task. Second, I examine how strength(weakness)-congruent feedback on effort(ability) tasks influences the participant's rationalization of their duration choice, and satisfaction in their task performance.

### *Distinction between Effort and Ability Tasks*

To examine participant perceptions on whether the word search task requires more ability than the letter search task, I asked five questions, each getting at a different aspect of ability and effort. These questions were asked right after participants received instructions on the tasks, but before beginning round 1. They were asked prior to the task so that the participant's performance on the tasks does not influence their answers.

I jointly analyze two questions which ask whether the respondent thought their performance on the letter(word) search task would be based on how hard they worked, versus their ability at the task. To analyze these, I create a binary variable *AbilityTask*. This is coded "1" if the word search task was rated as requiring as much or more ability than the letter search task and "0" otherwise. I find that 69% of participants rated the word search task as requiring equal or greater amounts of ability than the letter search task (untabulated). This is consistent with the word search task being farther along the continuum of effort and ability, compared to the letter search task.

Furthermore, I asked three additional questions to explore the characteristics of effort and ability tasks which I argue drive the differing responses to feedback. Specifically, ability tasks are more enjoyable and require more knowledge than effort tasks, and effort tasks are more tedious than ability tasks. These questions were formatted in such a way that on one end of a slider, at point 0, was the letter search task, and at the other end of the slider, at point 7, was the word search task. Participants moved the slider to indicate which task they believed the statement was most applicable to. In my analysis I first look at the mean of each question. I then run a t-test in which I compare the mean to the neutral value of 3.5. These results are presented in table 4.

<Insert Table 4>

The first question asks which task looks more enjoyable. According to my predictions, the word search task should look more enjoyable, so we should see a mean value higher than 3.5. Consistent with my predictions, the mean value is 4.88, and a t-test shows that this is statistically above the neutral point of 3.5 ( $t = 1.82$ ,  $p, 0.04$ , one-tailed). This provides evidence that participants viewed the word search task as being more enjoyable than the letter search task. The second question asks which task requires more knowledge. According to my predictions, the word search task should be perceived as requiring more knowledge. Consistent with my predictions, the mean value (5.23) is higher than the neutral point ( $t = 7.27$ ,  $p < 0.01$ , one-tailed). This provides evidence that participants viewed the word search task as requiring more knowledge than the letter search task. These results are consistent with the word search task being more ability driven than the letter search task.

The third question asks which task looks more tedious. According to my predictions, the letter search task should be perceived as more tedious. Thus, we should see a mean value lower

than 3.5. Consistent with my predictions, the mean value is 2.32 ( $t = -4.22, p < 0.01$ , one-tailed). Once more, this is consistent with the letter search task being more effort driven than the word-search task. Specifically, the letter search task being higher on the level of tediousness supports the theory that effort tasks are costly in terms of the self-control needed to complete them. Taken together, these analyses suggest that participant perception of the letter search and word search tasks are consistent with theoretical distinctions between ability and effort.

### *Choice rationalization and performance satisfaction*

I next investigate what impact feedback strength(weakness)-congruence has on participant rationalization of duration choice, and performance satisfaction. I argue that one reason a participant chooses to spend more time on a task in the strength-congruent ability condition is their enjoyment of the task. To provide evidence consistent with this, I examine what motives participants reported for choosing to allocate the time the way that they did. Specifically, in my post-experimental questionnaire, I asked how much the participant's choice to spend time on the task was influenced by problems solved, the feedback provided by the organization, and enjoyment of the task. Participants are asked to allocate 100 points among the three choices. See table 5, panel B for allocations. In most conditions, points were allocated about evenly, with each condition getting around to 32-35% of the points. However, there are two significant deviations from this pattern. First, those in the weakness-congruent condition who received feedback on the ability task only allocated 22% of the points to the *Enjoyment of Task* reason. Instead, they chose to allocate those points to the *Problems Solved* choice. Second, those in the strength-congruent condition who received feedback on the ability task allocated 39% percent of their points to the *Enjoyment of Task* reason, leaving the *Problems Solved* choice with only 29% of the points. Taken together, these results support my theory that motives for



performance increase on the ability task in round 2 are different between those who received strength-congruent feedback on the task and those who received weakness-congruent feedback on the task.

<Insert Table 5>

Hypothesis one theorizes that strength congruent feedback positively impacts self-concept, which is greater for those receiving feedback on ability tasks. To examine this, I use two questions in the postexperiment questionnaire to measure feelings of performance satisfaction on tasks which received feedback. These questions ask whether the participants agreed with the statement “I was pleased with how well I did on the letter(word) search task.” I refer to this variable as *Satisfaction*. These questions measure how participants felt about their own performance, on a scale ranging from 1 to 7. To analyze this, I first compare how pleased participants were with the task they received feedback on between participants who received strength congruent feedback and those who received weakness congruent feedback. I find that of participants who received feedback on the effort task, those who received strength-congruent feedback had a mean *Satisfaction* score of 5.09, compared with 4.38 for those who received weakness-congruent feedback, however results are not significant. For those who received feedback on the word search, the *Satisfaction* scores were 6.15, compared to 4.81 for those who received weakness-congruent feedback. Results are also not significant. Results are presented in table 6. Second, in order to isolate the effect that feedback has on these perceptions, I compare the satisfaction scores between those who received feedback on the task, with those who did not receive feedback. Unsurprisingly, I still find that those who were better at a task were more satisfied with it than those who were worse at the task (*Effort*; 4.13 compared 3.83 and *Ability*; 5.41 compared to 4.33.) While these results are also not significant, we can see a couple of

patterns. First, the difference between *Satisfaction* scores is greater in both ability and effort conditions for those receiving feedback, versus those not receiving feedback (*Effort*; 0.71 compared to 0.30 and *Ability*; 1.34 compared to 1.08.) This suggests that feedback has some influence on satisfaction. Second, the difference in satisfaction between doing relatively well or poorly at the task seems to be stronger when it is given on the ability task, compared to the effort task. This is consistent with theory which indicates that success or failure at an ability task has a greater impact on self-concept than success or failure on an effort task.

Last, I compare between participants who received strength (weakness)-congruent feedback, and those in the neutral condition who had the same strength (weakness). I find that regardless of whether the effort or ability task was emphasized, participants in the strength-congruent condition were at least marginally significantly more satisfied with performance than their counterparts in the neutral condition (*Effort*;  $T=3.89$ ,  $p, 0.03$  one-tailed) and *Ability*;  $T=1.76$ ,  $p, 0.09$  one-tailed.) On the other hand, those in the weakness congruent conditions were not significantly happier than their neutral counterparts (*Effort*;  $T=0.94$ ,  $p, 0.16$  one-tailed and *Ability*  $0.97$ ,  $p, 0.16$  one-tailed) This suggests that the strength-congruent feedback has a stronger effect on the participant's view of their performance than does the weakness congruent feedback.

## V. CONCLUSION

This study examines how workers respond to feedback and allocate effort in the multitask environment, specifically looking at allocation between effort and ability tasks. A growing body of accounting literature focuses on controls in a multitask environment. It finds that individuals allocate effort differently between tasks depending on features of the organizational environment. I examine feedback as one of these features.

I find evidence that effort duration is similar between more effort or ability driven tasks when the feedback emphasizes a weakness. However, when developmental feedback emphasizes a strength, the duration of effort is longer when it is a more ability-driven task. Supplemental analysis suggests that this may be mainly due to the ability task being most enjoyable to those receiving strength congruent feedback on it. This suggests that an organization should consider the type of task when giving developmental feedback.

Additionally, I find that when workers are instructed to focus on an ability-driven task, they only choose to spend additional time on the task when it is a strength. However, regardless of whether the ability driven task is a strength or weakness, workers instructed to focus on the ability driven task experience a greater performance increase than workers instructed to focus on the more effort driven task. While this adds to the literature, it has practical implications as well. This indicates that managers can expect different responses to developmental feedback, based on whether the task focused upon is more effort or ability driven. This can help managers to make a more informed decision on where their feedback will be useful, given the goals of the organization.

My study also adds to the current discussion in academic and practitioner literature on the value of feedback which focuses on weaknesses (Ashford and Northcraft 2003; Vancouver and Tischner 2004; Finkelstein and Fishbach 2011; Van Dijk and Kluger 2011; Weidinger et al. 2016; Lechermeier and Fassnacht 2018). My study suggests that forward looking feedback on a weakness may improve performance, and that this is magnified when the developmental feedback focuses on ability-driven tasks.

There are several avenues of future research moving forward. Future research can examine whether the salience of the tasks as effort or ability influences allocations, as well as

how emotionally charged language influences performance. Additionally, future research can explore in greater depth how effort intensity differs on the non-emphasized tasks, and whether aspects of round 1 performance influence subsequent allocation choice and performance.

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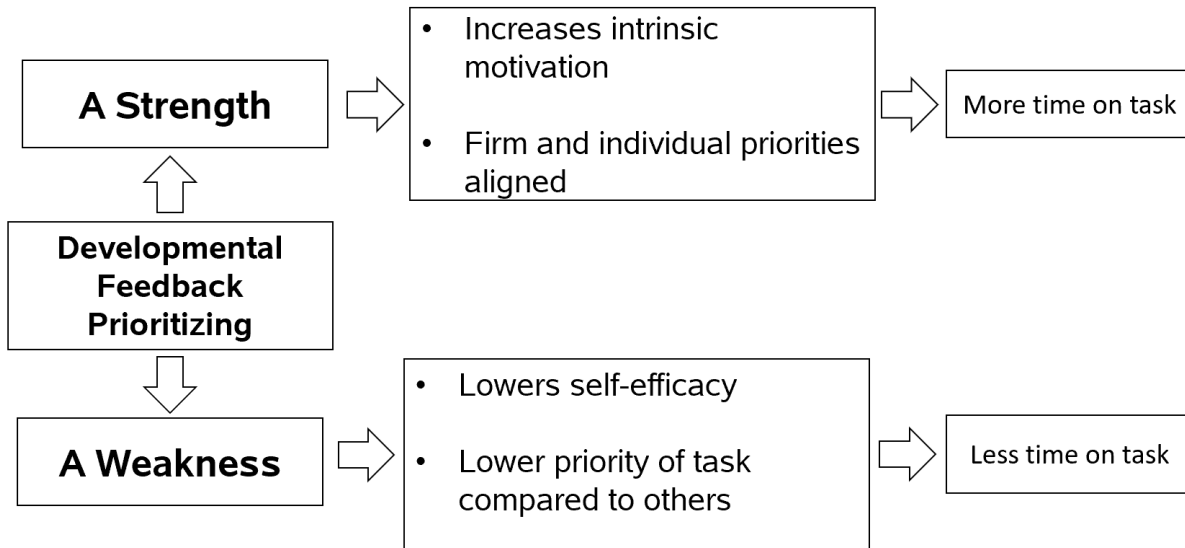
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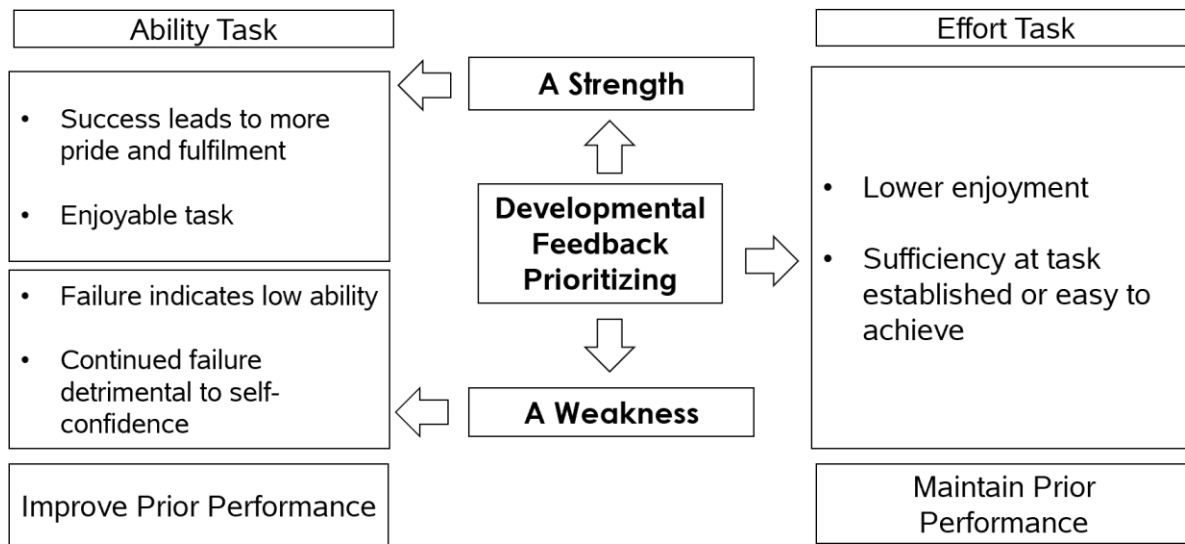


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**Figure 1a**  
**Theoretical diagram for hypothesis 1a**



**Figure 1b**  
**Theoretical diagram for hypothesis 2**



**Figure 2A**  
**Example of Letter Search Puzzle Task**

Letter Search Problem

X	C	Q	S	F	N	A	X	V	V
D	A	Q	H	N	I	N	V	L	U
D	V	L	H	Y	U	T	B	K	P
D	V	L	B	I	G	J	Y	A	P
Z	K	R	S	B	L	R	T	T	I
A	D	P	S	K	A	F	Q	Y	D
V	O	J	L	B	X	M	E	J	V
R	Y	C	C	E	M	L	G	A	N
N	M	U	G	R	N	Z	O	W	G
G	Z	J	K	K	A	P	Y	V	D

How many times does letter "A" appear in the above box?

**Figure 2B**  
**Example of Word Search Puzzle Task**

Word Search Problem

T	N	R	D	I	P	G	C	S	O
E	X	B	E	Q	J	Z	Q	G	N
Z	S	T	H	E	R	E	Y	J	U
T	E	C	U	R	I	Z	Z	W	M
E	D	X	Q	Y	T	Q	C	O	S
S	F	U	K	X	U	E	G	U	J
D	U	L	S	I	U	F	I	L	N
L	L	D	X	X	I	N	J	D	S
F	W	H	I	C	H	C	R	V	E
B	F	C	N	J	S	J	A	P	M

find a five letter word hidden in the matrix. type it into the box.

Figure 2A is an example of the letter search task seen by participants. Figure 2B is an example of the word search task seen by participants.

**Figure 3A**  
**Example of Outcome Feedback Received in the Strength-Congruent/Effort condition**

Letter Search	Word Search
2	1

Which task did you perform better at?

Word Search or Letter Search

**Figure 3B**  
**Example of Developmental Feedback Received in the Strength-Congruent/Effort condition**

To better develop you as an employee, the organization would like you to focus on improving your performance on the letter search task

Figure 3A is the output feedback received by participants in the strength-congruent/effort condition. Figure 3B is the developmental feedback received in the strength-congruent/effort condition.

**Figure 4**  
**Feedback Consistent Duration, Performance Improvement, and Scaled Changes in Tasks**



These tables present graphical representations of my results for H1 and H2. Panel 1 presents the amount of time allocated towards the feedback-consistent task by condition. Panel 2 presents the scaled change in performance on the feedback-consistent task by condition. Panel 3 presents the scaled number of letter searches solved by condition. Panel 4 presents the scaled change in number of word search problems solved by condition.

**Table 1**  
**Number of letter search and word search puzzles solved by round**  
**Average (std. dev.) [observations]**

	<b>Round 1</b>		<b>Round 2</b>	
	<i>Strength Congruent Feedback</i>	<i>Weakness Congruent Feedback</i>	<i>Strength Congruent Feedback</i>	<i>Weakness Congruent Feedback</i>
<b><i>Workers Higher at Effort Task</i></b>				
<i>Letter Search Task</i>	12.15 (4.30) [33]	10.07 (3.27) [27]	15.91 (7.20) [33]	12.00 (6.39) [27]
<i>Word Search Task</i>	7.64 (3.72) [33]	5.26 (3.48) [27]	12.09 (6.31) [33]	9.88 (6.04) [27]
<b><i>Workers Higher at Ability Task</i></b>				
<i>Letter Search Task</i>	9.50 (4.33) [20]	11.10 (3.48) [21]	8.90 (5.51) [20]	14.71 (7.19) [21]
<i>Word Search Task</i>	13.35 (5.35) [20]	14.76 (3.85) [21]	22.80 (9.47) [20]	16.10 (7.01) [21]

This table describes the number of letter search and word search tasks solved, broken down by whether they were solved on round 1 or 2, and whether they were solved by those better at the effort (letter search) task or ability (word search) task.

**Table 2**  
**Feedback Consistent Duration**

**Panel A: Average (std. dev.) [observations] Feedback Consistent Duration**

	<i>Strength Congruent Feedback</i>	<i>Weakness Congruent Feedback</i>	<i>Total By Task Type</i>
<i>Effort-Task Focused</i>	4.97 (1.42) [33]	4.52 (1.76) [27]	4.77 (1.59) [60]
<i>Ability-Task Focused</i>	6.1 (1.07) [20]	4.57 (1.36) [21]	5.32 (1.43) [41]
<i>Total By Feedback Congruity</i>	5.39 (1.41) [53]	4.54 (1.58) [48]	4.99 (1.55) [101]

**Panel B: ANOVA**

<b>Source</b>	<b>df</b>	<b>MS</b>	<b>F-Stat</b>	<b>p-value</b>
Feedback Congruity	1	23.76	11.26	<0.01***
Task Focus	1	8.49	4.02	0.05**
Feedback Congruity*Task Focus	1	7.04	3.34	0.07*
Residual	97	2.11		

**Panel C: Simple Effects**

<b>Source</b>	<b>F-Stat</b>	<b>p-value</b>
Congruent: <i>Effort vs. Ability task</i>	7.54	< 0.01***

\*, \*\*, \*\*\* indicates significance at the 0.10, 0.05, and 0.01 level, respectively.

Reported p-values are two-tailed unless testing a one-tailed prediction, as indicated in bold.

Panels A through C provide the results of an ANOVA with the average *Feedback Consistent Duration* as the dependent variable and the *Feedback Congruity* and *Task Focus* as independent variables. *Feedback Consistent Duration* is the amount of time allocated to the task which the worker received developmental feedback on.

**Table 3**  
*Feedback Consistent Performance Improvement*

**Panel A: Average (std. dev.) [observations] *Feedback Consistent Performance Improvement***

	<i>Strength Congruent Feedback</i>	<i>Weakness Congruent</i>
<i>Effort-Task Focused</i>	0.49 (1.34) [33]	0.22 2.54 [27]
<i>Ability-Task Focused</i>	1.5 (0.98) [20]	0.78 (0.97) [21]

**Panel B: ANOVA**

<b>Source</b>	<b>df</b>	<b>MS</b>	<b>F-Stat</b>	<b>p-value</b>
Feedback Congruity	1	5.57	2.53	<b>0.06*</b>
Task Focus	1	15.42	6.49	0.01***
Feedback Congruity*Task Focus	1	1.05	0.52	0.47
Residual	97	2.35		

\*, \*\*, \*\*\* indicates significance at the 0.10, 0.05, and 0.01 level, respectively.

Reported p-values are two-tailed unless testing a one-tailed prediction, as indicated in bold.

Panels A and B provide the results of an ANOVA with the average *Feedback Consistent Duration* as the dependent variable and the *Feedback Congruity* and *Task Focus* as independent variables. *Feedback Consistent Duration* is the amount of time allocated to the task which the worker received developmental feedback on.



**Table 4**  
**Analysis of Pre-Experiment Questions**

Question	Mean (st. dev.)	t-statistic	p-value
<i>Enjoy</i>	4.88 (2.80)	1.82	<b>0.04**</b>
<i>Knowledge</i>	5.23 (2.39)	7.27	<b>&lt;0.01***</b>
<i>Tedious</i>	2.32 (2.81)	-4.22	<b>&lt;0.01***</b>

T-Tests comparing mean responses to pre-experiment questions to neutral value of 3.5

\*, \*\*, \*\*\* indicates significance at the 0.10, 0.05, and 0.01 level, respectively.

Reported p-values are two-tailed unless testing a one-tailed prediction, as indicated in bold.

*Enjoy* is the response to the pre-experiment question "Which task looks more enjoyable to you?"

*Knowledge* is the response to the pre-experiment question "Which task do you think requires more knowledge?"

*Tedious* is the response to the pre-experiment question "Which task looks more tedious to you?"

**Table 5**  
**Responses to Post-Experiment Questions**

**Panel A:** Average Satisfaction with performance by condition(Mean and Standard Deviation)

	Workers Better at Letter Search			Workers Better at Word Search		
	Strength- Congruent Feedback	Weakness- Congruent Feedback	Neutral	Strength- Congruent Feedback	Weakness- Congruent Feedback	Neutral
<i>Letter Search Satisfaction</i>	5.09 (1.76)	5.52 (1.34)	4.13 (1.77)	3.95 (1.47)	4.38 (1.40)	3.83 (1.59)
<i>Word Search Satisfaction</i>	4.48 (1.80)	4.81 (1.73)	4.33 (1.80)	6.15 (0.81)	5.62 (1.02)	5.41 (1.44)

*Letter Search Satisfaction* is the mean response to the post-experiment question "I was pleased with how well I did on the letter search task." using a 7 point likert scale 1-disagree completely to 7-agree completely

*Word Search Satisfaction* is the mean response to the post-experiment question "I was pleased with how well I did on the word search task." using a 7 point likert scale 1-disagree completely to 7-agree completely

**Panel B:** Reasons given for effort duration choice by condition

	Workers Better at Letter Search		Workers Better at Word Search	
	Strength- Congruent Feedback	Weakness- Congruent Feedback	Strength- Congruent Feedback	Weakness- Congruent Feedback
<i>Problems Solved</i>	37%	46%	29%	35%
<i>Feedback</i>	31%	32%	32%	31%
<i>Enjoyment of Task</i>	32%	22%	39%	34%

Presented above is the mean response to the question "How was your decision to spend time on each task influenced by each of the following reasons?" Participants were asked to allocate 100 points between 3

answers. *Problems Solved* is the percentage allocated to the response "The number of problems I solved on each task." *Feedback* is the percentage allocated to the response "The feedback provided by the organization." *Enjoyment of Task* is the percentage allocated to the response "My enjoyment of the task."