

The Effects of Goal Orientation and Feedback on the
Notetaking Habits and Performance of College Students

Kamauru Rasheed Johnson

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ABSTRACT

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Notetaking is viewed by high school and college students as a tool to help them record and organize information presented by their instructors in lecture format. Research has shown that students who take notes consistently outperform students who do not use this strategy on tests of their knowledge. Although previous studies have identified factors contributing to individual differences in notetaking, these works have largely focused on cognitive skills while neglecting to consider the role that a students' motivation may play in their notetaking habits. The current study is an extension of lecture notetaking research (Peverly et al, 2007; Peverly et al., 2010; Reddington, 2011) that applies principles of Elliot's trichotomous goal orientation theory to investigate the question of student motivation. Specifically, this dissertation's primary purpose was to determine if goal orientation and feedback affect students' notetaking habits or performance on measures of their knowledge. Hypotheses related to the established relationships between gender and notetaking and notetaking and performance were also explored. This dissertation is unique in that it is the only study to examine the effects of goal orientation on the specific strategy of notetaking through the use of an experimental design.

A sample of 231 undergraduate students participated in the two-phase experiment. In phase I, participants were randomly assigned to one of three goal orientation groups, asked to listen to a videotaped lecture and to write a detailed summary of what they had learned. In phase II, participants were randomly assigned to receive contrived feedback stating that their phase I written summary was either above or below an arbitrary performance standard. After reviewing

their feedback, participants were again asked to listen to a videotaped lecture and write a detailed summary of what they had learned. Independent variables included gender, goal orientation, and feedback. Dependent variables included quantity of idea units in students' notes and quantity of idea units in students' written summaries.

Results indicated that factors related to goal orientation, feedback, and gender did impact students' notetaking quantity and performance. Note quantity was predicted by gender, goal orientation, the gender x goal orientation interaction, and the feedback x goal orientation interaction. Quantity of idea units in written summary was predicted by note quantity, the gender x goal orientation interaction, and the note quantity x goal orientation interaction. Future research should continue to examine the specific impact of goal orientation and feedback on notetaking habits.

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Chapter I

Introduction

High school and college students spend a majority of classroom time listening to lectures (Armbruster, 2009). While listening to lectures, it is common practice for students to take notes on the spoken words of their teachers. The importance of note-taking to the learning process has been highlighted through research and anecdotal reports from teachers and students (Armbruster, 2009; Palmatier & Bennett, 1974; and Peverly et al., 2007). Further, many study skills books highlight the value of note taking and offer strategies to improve efficiency and skill (Locke, 2001). Students themselves also recognize the importance of the strategy and report that they find value in it. In a survey study of undergraduate students at the University of Georgia, a full 99% of respondents reported that they took notes and 96% of students felt that note taking was an essential practice for success in college (Palmatier & Bennett, 1974).

Student's faith in the effectiveness of note-taking has been supported by research which confirms that students who take or review notes consistently outperform those who do not use this strategy (Barnett, Di Vesta, & Rogozinsky, 1981; Divesta & Gray, 1972; Kiewra, 1989; Kobayashi, 2005; Nye, Crooks, Powley, & Tripp, 1984; Slotte & Lonka, 1999). Working with students listening to sets of 5 minute lecture clips, Di Vesta et al. (1972) found that learners who took notes performed better on multiple choice performance measures than students who did not take notes. Nye et al. (1984) examined notes from university students and found high positive correlations between the amount of notes taken and performance on exams. More recently, Slotte et al. (1999) reviewed text notes of high school graduates. Their findings revealed positive relationships between students' use of notes and their comprehension of the information provided.

Given the importance of note taking as a strategy for academic success, some research has explored the individual differences that affect note quality. Much of this work has highlighted cognitive factors including working memory, cognitive style, and prior knowledge (Armbruster, 2009; Peverly et al., 2007;). Gender has also been noted as an important factor in influencing individual differences in notetaking habits (Reddington, 2011). Researchers have consistently found that female students take notes of higher quality than male students (Cohn, Cohn, & Bradley, 1995; Peverly et al., 2007; Reddington, 2011). Although these variables do account for some of the variance observed in individual note taking skill, it is important to realize that these variables relate only to the impact of ability on note taking and neglect the question of how motivation or the desire or will to take notes affects the process. Since notetaking is time consuming and very effortful (Locke, 2001; Peverly, 2006; Peverly et al., 2007; Piolat, Olive, & Kellog, 2005; Van Meter, Yokoi, & Pressley, 1994), the desire to succeed and the willingness to persist may affect the quality and quantity of students' notes. Piolat et al. (2005) found that the process of listening to, deciphering, remembering and recording information from lectures required significant cognitive effort. Their experiment showed that note taking requires more effort than the tasks of reading and learning alone. A survey of college students by VanMeter et al. (1994) revealed that students chose to take notes and are selective about the types of notes that they take. These results are not surprising in light of Thomas and Rhower's (1986) theory of studying that argues that all studying is a "mixture of skill and will." In order to be an effective learner, a student must have the skills to study as well as the desire to apply those skills. If note taking is viewed as an effortful strategy, it is likely that there is a connection between the quality of a student's notes and the student's motivation for taking notes. Questions about the student's reason for attempting the task, the student's perception of their

ability to perform well, and even their interest in the subject matter could be significant and should be addressed when examining note quality. This dissertation seeks to begin to answer that neglected question of motivation by assessing the specific impact of a student's goals on their note-taking strategies.

This dissertation examines a particular segment of the motivation variable and its relationship to note taking more closely. Specifically, this dissertation will explore the suspected relationship of the construct of goal orientation, the student's reason for participating in a task, to lecture note taking. There is a significant amount of research that suggests that goal orientation may impact strategy use and task performance (VandeWalle, Cron, & Slocum, 2001). Over the past several decades, theory and research has focused on two major classifications within this construct (Elliot & Dweck, 1988; Elliot et al., 1999; Nolen, 1988; VandeWalle et al., 2001; Wolters Yu, & Pintrich, 1996). One set of goals is related to learning, improving competence and mastering skills, while the other set of goals relates to demonstrating skills, comparing competence with others, and achieving performance standards.

The most current research has produced a more detailed three-factor theory of goal orientation. The three-factor theory proposed by Elliot suggests that an individual's goals generally fall into one of the following categories: Learning, Performance-Approach and Performance-Avoidant. Individuals with learning goals study and attend class with the main goal of learning and self-improvement. On the other hand, students with performance goals generally seek to establish their ability with regard to others. In the performance-avoidant condition, individuals seek to avoid an overt failure. They are focused on minimizing the chances that they will not meet a stated goal. In the performance-approach goal condition, individuals work toward meeting a stated achievement goal (Elliot et al., 1999).

Several studies indicate that goal orientation can affect strategy use and other task related behaviors. VandeWalle et al. (2001) suggested that in comparison to a performance goal orientation, a learning goal orientation can lead to a more adaptive pattern of self-regulation procedures. Individuals who approached training exercises in a sales training workshop with a learning goal orientation tended to pick higher goals, plan more effectively, and exert more effort towards meeting their stated goals.

Similar relationships were also seen within an educational setting. Students approaching their schoolwork with learning goal orientations were more likely to adopt positive patterns of motivational beliefs such as high task value, self-efficacy, and both cognitive and self-regulatory strategy use (Wolters et al., 1996). Nolen (1988) found that varying goal orientations affected the kinds of strategies that students used. Children with learning goal orientations reported valuing and using both deep and surface processing strategies. A performance goal orientation was only positively related to valuing and using surface level processing strategies. Viewing note-taking as an effortful strategy, it is likely that a student's goal orientation will affect students' use of this technique.

While students with learning goal orientations tend to approach their work with different strategies than students with other goal orientations, these relationships are moderated by feedback about students' success in achieving those goals. Diener and Dweck (1978) showed that when they receive feedback consistent with a failure, mastery oriented children were more resilient and often showed improvements in effort and strategy when compared to helpless children (with performance avoidance goal orientations), who were more likely to withdraw. In a related study, Elliot and Dweck (1988) hypothesized that individuals with different goal orientations would respond differently to difficulty depending on the type of feedback that they

had received about their past performances. Interestingly, individuals with learning goals continued to show a mastery-oriented response both when they received feedback consistent with failure and when they received feedback indicating success. When given negative feedback about their past performance, individuals with performance goals responded to difficulty with helpless behaviors such as deterioration in problem solving, and negative affect. When they received positive feedback about their past performances, individuals with performance goal orientations showed mastery responses similar to those with learning orientations. It is therefore possible that students who have different goal orientations will respond differently to positive or negative feedback in a note-taking situation.

This study attempts to further the findings of past researchers who have isolated some of the factors creating individual differences in note taking by investigating four principal research questions: (1) Do students with different goal orientations include different numbers of idea units in their notes? (2) Do students with different goal orientations include different numbers of idea units in their written summaries? (3) Do students with different goal orientations produce different numbers of idea units in their notes in response to different feedback? (4) Do students with different goal orientations produce different numbers of idea units in their written summaries in response to different feedback? Based on previous research, it is also hypothesized that H1) Female students will include more idea units in their notes; and that H2) Students who include more idea units in their notes will tend to include more idea units in their written summaries.

Chapter II

Review of Literature

Notetaking

Notetaking is defined as the process of writing down information directly stated by professors in lecture or inferred from information given during class time. Among college students, note taking is nearly a universal practice (Armbruster, 2000, 2009; Palmatier et al., 1974). In an ethnographic study of American college students, Van Meter et al. (1994) found that all students interviewed took notes as a part of their studying process. Previous studies have found similar results confirming the popularity of this strategy. Dunkel and Davy (1989) found that this is not a purely American phenomenon. While 94% of American students surveyed took notes, a comparable 92% of international students reported doing the same.

Taking notes has been shown to be one of the most important strategies for enhancing classroom learning (Armbruster, 2000, 2009). Studies have repeatedly shown a positive correlation between note taking and exam performance (Crawford, 1925; Barnett et al., 1981; Kiewra et al., 1983; Nye et al., 1984; Slotte et al., 1999; Peverly et al., 2007). For example, Crawford (1925) reviewed the notes and exam performances of 211 college and graduate students. His results suggested a strong positive correlation between the number of points recorded in a student's notes and the corresponding student's performance on a quiz related to that material. He further established that most often, the items that students recorded correctly in their notes were the items that they were able to recall on the quiz. Kiewra et al. (1983) analyzed the notes of 8 undergraduates for a period of 4 weeks. Relationships between specific information points and course performance were investigated. As expected, the quantity of ideas recorded directly impacted student exam performance. Students were twice as likely to recall

information that they had recorded in their notes than they were to recall information that they had omitted (Kiewra et al., 1983). Nye et al. (1984) reviewed sets of notes from college students on 10 selected lectures. Their analyses also indicated that there were strong relationships between the quantity of notes and student's exam performance. These correlations grew stronger in students who attended class most regularly.

Although the relationship between notes and exam performance is widely accepted, there has been debate about the specific function of note taking in the learning process. DiVesta and Gray (1972) suggested that there were two advantages to taking notes. Their proposed *encoding* function addressed the idea that writing information down at the time of the lecture helped learners make connections between what was being said and their prior knowledge. Einstein et al. (1984) compared the memory performance of students who took notes on a lecture with the performance of those who were only allowed to listen. Students in the note-taking condition recalled significantly more high importance propositions than low propositions while students in the listening only group recalled equal numbers of both kinds of information. These results seemed to indicate that the simple act of taking notes on what they heard helped them to incorporate lecture information into their memory—even when they were not permitted to review what they had written. Interestingly, Pepper and Mayer (1986) later found that while note takers outperformed non-note takers on tests of far transfer learning, such as problem solving, non-note takers often out performed note-takers on tests of near transfer learning like fact memorization and verbatim recall.

In addition to the encoding function, DiVesta and Gray (1972) also suggested that note-taking had an *external storage* function. They believed that as written documentation of lecture content, notes provided a valuable record that could be reviewed after the lecture. Their theory

held that post-lecture review could help learners relearn information or allow them to revisit and assess information that may have been confusing to them at the time of the lecture. In order to demonstrate the effects of reviewing notes on performance, DiVesta et al. (1972) tested students recall under a variety of conditions in which they were allowed to listen to the lecture, take notes, and review their notes. As expected, students achieved higher levels of recall and better performance on multiple choice exams when they were allowed to review their notes before the exam than when they were simply allowed to take notes. Continued research has supported the value of this external storage function (Kiewra, 1989, Kobayashi, 2005).

More recently, Kiewra et al. (1991) suggested a three-factor theory of note taking functions. They proposed an encoding function that was identical to the encoding function outlined by DiVesta et al. (1972), an encoding plus storage function, which combined both functions of the DiVesta et al. model (since they could not be practically separated), and a third external storage function, which included student use of lecture notes provided by teachers.

Subsequent research has shown support for this model and has shown differences in the usefulness of each type of function. Typically, these experiments have created separate note taking conditions that reflect each of the three functions outlined above. Students listen to a lecture and are asked to take notes only (encoding), take notes and review them (encoding plus storage), or review generated notes provided to them (storage only). Participants in each condition group are then asked to answer questions related to the lecture material (Benton, Kiewra, Whitfil, & Dennison, 1993; Kiewra et al., 1991). Kiewra et al. found that students in the encoding plus storage group typically outperformed students from other groups. Participants in the external storage group tended to outperform students in the encoding only group. Benton et al. (1993) found similar results.

Although nearly all students take notes, it has been observed by researchers that notes often differ with respect to quality, as well as the scope and range of what they cover (Armbruster, 2000, 2009; Palmatier et al., 1974; Van Meter et al., 1994). Research suggests that there are several cognitive and physical reasons for these differences (Armbruster 2000, 2009; Kiewra & Benton, 1988; Peverly et al. 2007; Piolat et al., 2005). For example, Kiewra et al. (1988) found evidence suggesting that information processing is one such factor. Kiewra et al. believed that the individual's capacity to hold and manipulate the information presented in a lecture was directly related to their note-taking ability. If an individual's ability in this area was limited, Kiewra hypothesized that their notes would be poor. Results of Kiewra et al.'s study confirmed this hypothesis. Students with lower information processing abilities recorded fewer words and total ideas as well as fewer subordinate ideas (Kiewra et al., 1988). Peverly et al. (2007) hypothesized that students who could write faster would have an easier time taking high quality notes. Their examination of the notes of undergraduates who watched a videotaped lecture supported this idea. Transcription speed was found to be the only significant predictor of note quality.

Other variables have also been shown to have an effect on note taking quality. Such variables include cognitive style, prior knowledge, and gender (Armbruster 2000, 2009). Of particular relevance to the present study is the variable of gender. Research has shown that students' notetaking habits differ by gender (Cohn et al., 1995; Reddington, 2011; Reddington, Sumowski, Johnson and Peverly, 2006). Cohn et al. (1995) examined the notes of 211 college students under varying experimental conditions. Their analysis revealed that within the sample, female students tended to take more complete notes and tended to record more words in their notes. Reddington et al. (2006) reviewed the notetaking habits of 151 undergraduate students

and also found that female students took higher quality notes. Reddington (2011) also found a similar relationship between gender and note quality. Results from her research with college students found that female students took notes of higher quality. Interestingly, her research also found that working memory, a cognitive variable known to impact note quality, differentially affected the note quality of males and females. Results indicated that working memory positively predicted note quality for females, but that this relationship was not significant for males, suggesting that gender is an important moderator to explore when investigating individual differences in notetaking habits. Based on this and other previous research, it is possible that gender may impact students' notetaking habits.

In addition to these variables, it is clear that certain motivational factors also play a role in students' choices about how and when to take notes. Broadly, the act of studying is "effortful." An individual makes an intentional choice to engage in studying behavior (Thomas et al., 1986). Notetaking too is deliberate. Students choose when to take notes, how to take notes and what to take notes about (VanMeter et al., 1994). In an ethnographic study, Van meter et al. (1994) interviewed focus groups totaling 252 undergraduate students. Search topics were aimed at discovering how students regulated their note taking processes. Analysis revealed that students were goal directed in their note-taking. While most students indicated that their major goal was to do well in their courses, subgoals such as wanting to learn, creating study guides outside of class, focusing their attention and other subgoals also affected their use of the strategy. In addition, students also reported that contextual factors such as professor's organization, rate of speech, and prior knowledge also affected their note choices.

Locke (2001) found that class policy and structure impacted student note taking. Review of notes from 161 college students revealed that students took more notes when presented class

material was new rather than when the lecture covered old material. These results further suggest that note taking is regulated by dispositional and motivational variables within each student. Based on the idea that note taking is a goal directed behavior, it is plausible that goal orientation will affect note taking strategy in students.

Goal Orientation Theory

Different individuals can approach the same task in the hope of achieving the same outcome, with different motivations for success. An individual's goal orientation can be viewed as the reason for their participation in task. Research over the past several decades has focused on two major classifications within this construct. One set of goals is related to learning, improving competence and mastering skills, while the other set of goals is related to demonstrating skills, comparing competence with others, and achieving performance standards.

Nicholls (1984) proposed that in some instances, individuals approach tasks with a desire to improve their competence in a given skill. Under these *task involvement* conditions, emphasis is placed on improvement with respect to past performances and internal (self) comparisons. Under *ego involvement* conditions, individuals approach tasks with a desire to demonstrate their competence with respect to the performance of others. The goal shifts from improvement and mastery to demonstration of performance. Nicholls believed that differences in the individual's approach would naturally affect other important motivational variables such as effort, task choice, and response to failure. Among other hypotheses, he proposed that when individuals had a low conception of their own ability, an ego involvement condition would cause them to withdraw from the task and would lower their performance.

Other researchers have used different language to describe similar goal orientation models (Archer, 1994). Ames (1984) noted that competitive and non-competitive goal states

should create situations in which children either focused on ability with respect to others in the group or on their own learning. Much like ego involved participants in Nicholls' theory, children with competitive goals focused on demonstrating their ability by comparison to the scores of others. Competitive goals exaggerated the importance of ability to the student's self worth and undermined the importance of task mastery. Children with noncompetitive goals were more focused on challenging themselves and mastering the tasks. Like Nicholls, Ames believed that when faced with poor performance feedback, noncompetitive children would be much more resilient and would display more adaptive reactions to failure.

Dweck (1986, 2002) also recognized two distinct goal orientation patterns. She proposed that *learning goals* included individuals' desires to increase their competence or to learn or master something new. *Performance goals* included individual's desires to seek favorable judgments of their performance or to avoid negative judgments of their competence. For the purposes of this research, the author will use the term *learning goal* to describe those goals which are focused on improving skill and mastering tasks and the term *performance goals* to describe those goals related to demonstrating competence or avoiding negative judgments.

Although Dweck's classification was closely related to previous work, its mention of performance goals as either a desire to gain positive judgments of competency or avoid negative judgments of competency foreshadowed a more recent expansion of this two factor model. Elliot and Church (1997) suggested that achievement goals are also affected by an individual's valence towards achieving a positive goal (approach) or avoiding a negative failure (avoidance). Based on this idea, Elliot et al. (1997) proposed a goal orientation theory with a three-part structure: mastery goals associated with the desire to learn, performance approach goals

associated with the desire to reach a performance standard, and performance avoidant goal associated with the desire to avoid failure to meet a performance standard.

Elliot and Church tested their theory in an experiment involving asking undergraduate students to complete questionnaires about factors including their goal orientations, competence expectancies, achievement motivation, and fear of failure and then comparing those results to measures of students' intrinsic motivation and exam performance. Factor analysis supported distinctions between each part of the three-factor model of goal orientation. Mastery goals were associated with intrinsic motivation, performance approach goals were positively associated with exam performance, and performance avoidant goal orientation was negatively associated with intrinsic motivation and exam performance (Elliot et al., 1997).

More recently, Wolters (2004) provided evidence that the principles of the trichotomous goal orientation theory would generalize to applications with younger groups of students. Wolters surveyed junior high school students enrolled in mathematics classes about their personal goal orientations, motivational engagement, strategy use, and achievement. Results from this study supported previous findings that learning, performance approach, and performance avoidant goals are distinct from each other. Specifically, students in the Wolters study that identified with the learning goal orientation reported having greater effort, persistence, and cognitive and metacognitive study strategies, and lower rates of procrastination. Learning goal orientation was not predictive of classroom performance. Performance avoidant goal orientation predicted disengagement from challenging academic tasks. Performance approach goal orientation predicted higher performance on classroom assessments.

The focus on approach-avoidance dimension of goal orientation theory eventually led to the creation of a model with four factors (Elliot et al., 2001). Mastery goals were broken down

into more specific mastery approach goals and mastery avoidance goals while performance goals were again split into performance-approach goals and performance-avoidance goals. The differences between mastery and performance goals remained the same as in previous theories; however, the mastery construct was split into two parts: mastery approach and mastery avoidant. Individuals with mastery approach goals sought to reach a high level of competency while individuals with mastery avoidance goals sought to avoid failing to learn. Similarly, individuals with performance approach goals “focused on attaining normative competence” while those with performance-avoidance goals “focused on avoiding normative incompetence.” Stated more simply, individuals with a performance-approach goal are interested in performance, but direct their efforts toward the goal of reaching a performance mark that can be compared to others. Individuals with a performance-avoidance goal direct their efforts toward the goal of avoiding failure in comparison to others.

To test this evolving hypothesis, Elliot et al. (2001) conducted a series of studies in which undergraduate students were surveyed about their achievement goals, several related dependent variables including study strategies, emotional response to testing, and exam performance. Factor analysis supported conceptual distinctions between each of the four groups. Similar to previous research, performance approach goals were associated with competitiveness, surface processing strategies, and exam performance, performance avoidant goals were positively associated with fear of failure and surface processing and negatively associated with deep processing and exam performance, and mastery approach goals were associated with perceived competence and deep processing strategies. The mastery avoidant goal orientation was conceptually different from the other goal orientations examined in the study, showing a separate antecedent and consequence profile which included positive associations with fear of failure, test anxiety, and emotionality

and a negative association with determination. However, it did not significantly predict strategy use or exam performance.

Although Elliot and others have continued to explore the mastery avoidant construct as an additional part of goal orientation theory, the scarcity of existing research makes it difficult to evaluate its power as a predictor of study strategy use and student achievement, which are the main dependent variables examined in the present research (Cury, Elliot, Fonseca, & Moeller, 2006; Kaplan & Maehr, 2007; Meece, Anderson & Anderson, 2006). Therefore, the researcher focused on Elliot's trichotomous achievement goal theory including mastery goals, performance approach goals and performance avoidance goals as the principal theory for use in this research (Elliot et al., 1999).

State and Trait Goal Orientation

While some researchers have conceptualized goal orientation as a stable trait, others have viewed it as a situational variable that is subject to change as an individual encounters new situations, and it is widely held that both theories hold value in determining the true nature of the construct (Button, Matieu, and Zajac, 1996). Those theorists supporting the "trait" conceptualization of goal orientation have tended to measure goal orientation through the use of questionnaires in their studies (Deiner & Dweck, 1978; Nicholls et al. 1985). In one study, Deiner et al. (1978) used the Intellectual Achievement Responsibility Scale (IAR; Crandall, Kratovsky, & Crandall, 1965) to help identify different goal orientation groups among children. Each of the items on the scale presents children with a scenario and asks children to attribute performance in the situation to internal or external factors. Deiner et al. grouped children who tended to attribute failure to lack of effort into the mastery (learning goal orientation) group, and

those who tended to attribute failure to external factors were placed in the helpless (performance goal orientation) group.

Nicholls, Patashnick, and Nolen also used questionnaires to measure student goal orientation (Nicholls, Patashnick, & Nolen, 1985). In their study examining students' goals for learning, they first developed a pool of items investigating factors such as purposes of schooling, personal goals in school, and satisfaction with school. They refined these questionnaires through a series of factor analyses and identified several subscale groupings that were related to a series of factors including ego social orientation and task orientation. Versions of this questionnaire have been used in subsequent studies to identify individuals' goal orientations (Duda & Nicholls, 1992; Nicholls, Cobb, Wood, Yackel, & Patashnick, 1990; Thorkildsen, 1988).

Researchers holding the "state" view have tended to manipulate goal orientation through experiments designed to identify changes in behavior based on different motivational conditions. Ames (1984) manipulated goal orientation by varying task instructions given to middle school children. Participants in the "competitive" goal condition were given a set of directions asking them to solve more puzzles than a peer in the room, while participants in the "individualistic" goal condition were given directions asking them to complete as many puzzles as possible to try to improve upon their previous personal performance. These goal conditions are related to performance and learning goals respectively. Differences between groups were found in several key areas. While children made more ability attribution statements in the competitive condition than in the individualistic condition, children in the individualistic condition used more self-instructional statements than children in the competitive condition. Interestingly, the study found no differences in affective reactions across conditions (Ames, 1984).

Ames' manipulation of goal orientation in this study supports the idea that goal orientation may be influenced by situational factors. Seemingly, both "state" and "trait" goal orientation theories are important to consider when examining the theory as a whole. For the purposes of this dissertation, we will focus on "state" goal orientation, with the understanding that this is only one part of a larger theory within the literature.

Effects of Goal Orientation on Behavior

In a series of experiments, Elliot et al. (1996) examined whether or not goal orientations could influence individuals' intrinsic motivation. In order to examine this, they recruited undergraduate students and randomly assigned them to one of four experimental conditions with varying goal orientations including performance approach, performance avoidant, performance neutral, and mastery. Results indicated that performance approach and performance avoidant goals had differential effects in several key areas. While mastery goals appeared to heighten intrinsic motivation, performance approach goals improved performance on graded tasks and performance avoidant goals reduced intrinsic motivation and graded performance (Elliot et al., 1996).

Subsequent research by VandeWalle and others has focused on supporting these ideas. When developing an instrument to measure this construct, VandeWalle et al. (1997) surveyed university students with a 50-item questionnaire designed to determine their goal orientations. As expected, factor analysis identified a pattern of learning, avoidance (performance avoidant) and proving (performance approach) goals very similar to those outlined in the trichotomous theory proposed by Elliot. VandeWalle (2001) further suggested that in comparison to a performance goal orientation, a learning goal orientation can lead to a more adaptive pattern of self-regulation procedures. In a review, he cites the example of goal level as a self-regulation

strategy that can differ as a result of goal orientation. He explains that because individuals with a learning goal orientation seek to increase their competency, they are likely to pick high goals which are more challenging so that they can maximize their possibilities for learning.

Individuals with performance goals have been shown to pick goals that are less challenging and more realistic because they are concerned with achieving a certain score. In one experiment, VandeWalle measured the goal orientation of sales people and asked them to set a target goal for total monthly sales. Not surprisingly, it was found that individuals with a learning goal orientation generally set higher goals for themselves than individuals with performance goal orientations. It is important to note that this difference was also found to affect their overall sales performance. Individuals who picked higher goals for themselves tended to outperform those who had selected lower goals.

Goal orientation can also affect the type of goal that is chosen. In a similar experiment, VandeWalle et al. (2001) asked business school students about the types of individual goals that they had set for themselves in a specific class. It was discovered that individuals with a learning goal orientation chose goals that were related to the overall goal of improving their skill level in the subject area. Specifically, some students mentioned a desire to “develop new presentation skills” and “refine existing presentation skills.” Individuals with performance goal orientations were found to have more competitive goals such as “present better than other seminar presenters” or avoidance goals such as avoiding embarrassment or poor reviews. While the improvement goals of the learning oriented group were positively related to their performance, the competitive goals and avoidance goals of the latter group were not significantly related to their performance (VandeWalle et al., 2001).

Planning, which is another important self-regulation behavior, has also been linked to goal orientation through research. In the same experiment in which VandeWalle questioned sales personnel about their goal orientations, his research team also found that individuals with learning goal orientations had significantly higher scores for several types of planning than individuals with performance goal orientations.

Finally, goal orientation can also affect the amount and type of effort put forth by an individual. Individuals with a learning goal orientation believe that effort is an important key to achievement. On the other hand, those with a performance goal orientation tend to downplay the importance of effort to improvement (Ames, 1992; Dweck, 2002). In one study, Stevens and Gist (1997) measured the goal orientations of students in a negotiation training seminar. Results from their analysis suggested that individuals with a learning goal orientation planned to exert more effort than their counterparts with performance goal orientations. Further studies by VandeWalle and others have found similar results supporting the idea that individuals with learning goal orientations view effort as important to success and often plan to exert more effort than individuals with a performance goal orientation (Locke & Latham, 2006; VandeWalle, 1999).

Together, these constructs have been seen to be relevant to performance. VandeWalle uses a hypothetical job scenario to explain how the different strategies fit together. When confronted with a challenging task, an employee that has a learning goal orientation is likely to set challenging goals that focus on the desire to improve skill level. That same employee is likely to develop a strategic plan and exert a high amount of effort to meet his or her stated goals. On the other hand, an employee who is confronted with the same challenging task but who approaches it with a performance goal orientation will likely set a goal low enough to ensure

success. This employee would likely employ performance oriented strategies and focus much less on planning, and effort (VandeWalle et al., 2001).

Not surprisingly, these different approaches can affect individual and group performance. In the same experiment in which VandeWalle asked sales personnel to rate their goal orientations and their usage of self regulation strategies, the research team also monitored the relative performance of each of the participants. It was shown that learning goal orientation was positively related with sales performance. The relationship was fully mediated by goal setting, effort and planning tactics (VandeWalle, 1999). Further research by Elliot, Macgregor, and Gable (1999) also supports this idea. The researchers found that achievement goals can affect exam performance in college students. Specifically, their experiment revealed that mastery goals were positively related to persistence and effort while performance approach goals were positively related to effort and exam performance. Performance avoidant goal orientations were negatively related to exam performance (Elliot et al., 1999).

Goal Orientation and Academic Achievement Strategies

Given the importance of goals and achievement within the school setting, it seems clear that the previous findings would be valuable when exploring student behavior. Constructs such as goal level, goal type, effort, and planning are clearly applicable when investigating how students approach the tasks related to academic achievement. In addition to a more general exploration of goal orientation and student behavior, an entire line of research has been dedicated to exploring the relationship between students' goal orientation and their use of study skills and academic strategies. Broadly, these articles support the idea that students with a learning goal approach to their studies are more likely to value and practice good study habits while individuals with a performance goal orientation are less likely to do so.

Wolters, Yu, and Pintrich (1996) explored the relationship between goal orientation and self-regulated learning strategies in junior high school students. Over the course of an entire school year, data were collected through the use of self-report questionnaires. Keeping in mind the idea that goal orientations are not mutually exclusive, they found evidence that students with high learning goal orientations and high relative ability goal orientations (performance approach) were more likely to adopt positive patterns of motivational beliefs. These belief patterns often included high task value, self efficacy, and both cognitive and self-regulatory strategy use (Wolters et al., 1996).

Further research has continued to show a marked difference in the learning strategies used by students with varying goal orientations. Nolen (1988) uses the terms *surface level* and *deep level* processing to describe strategy differences. Deep level processing includes discriminating important information from unimportant information, trying to figure out what new information fits with prior knowledge, and monitoring comprehension. Surface level strategies include memorization of important information, rehearsal strategies, and repetitive review aimed at memorization. Deep processing is more likely than surface level processing to lead to a meaningful understanding of information. Relationships between the goal orientations and processing styles of middle school students were investigated. As expected, results supported the conclusion that there was a significant relationship between the two constructs. Learning goal orientation was positively related to valuing and using both deep and surface processing strategies. Performance goal orientation was only positively related to valuing and using surface level processing strategies (Nolen, 1988).

A relationship between goal orientation and cognitive engagement during lecture and classroom activities has been supported. Meece, Blumenfield, and Hoyle (1988) suggested that

learning goal orientations would be linked to more active cognitive engagement while performance goal orientations would be linked to lower levels of cognitive engagement. In a study exploring this relationship, Meece et al. (1988) surveyed 275 5th grade students about their goal orientations and levels of cognitive engagement during specific periods of class. Results from their analysis showed that students with learning goal orientations reported using higher levels of cognitive engagement including metacognitive and self-regulation strategies such as monitoring attention and effort, relating new information to existing knowledge, and actively monitoring comprehension. It was also found that students with performance goal orientations used techniques that would maximize short term retention for a test, but did not focus on learning as an important part of the task.

The notion found in the broad literature that goal orientation can affect performance is also found within the academic achievement literature. Dupeyrat and Marine (2005) explored the relationship between goal orientation and achievement. Self report questionnaires were used to measure goal orientation and other independent variables while the student's final grades were used as a gauge of their academic performance. The expected relationships were supported. The mastery goal condition showed the expected positive relationship with deep processing strategy use, effort, and achievement.

Elliot et al. (1999) examined goal orientation as a predictor of self reported cognitive and motivational study strategies and tested study skills as mediators of the relationship between goal orientation and exam performance. Questionnaires were used to measure goal orientation and strategy use and a short 100-point exam was used as a measure of performance. The researchers found evidence to support the previous findings that students' goal orientation can affect their strategy behavior. Mastery goals were associated with deep processing, persistence, and effort;

performance-approach goals were associated with surface processing, persistence, and effort; and performance avoidance goals were associated with surface processing and disorganization. The Elliot study also found that performance approach goal orientation was positively associated with exam performance and that performance-avoidance goal orientation was negatively related to exam performance. Curiously, mastery goal orientation did not show a significant relationship to exam performance. This finding may seem to contradict previous research, but as the researchers note, the relationship between the performance-approach goal orientation and exam performance was mediated by both persistence and effort.

Effects of Goal Orientation and Feedback on Behavior

Although the relationship between goal orientation and strategy use has been strongly supported, research has also shown that this relationship is affected by feedback received from the environment (Deiner et al., 1978; Elliot et al., 1988; Richard, 2003; VandeWalle, et al., 2001). VandeWalle et al. (2001) explain that feedback gives individuals information about their performance which can be used to determine behavior and strategies that will be most effective in subsequent attempts. Individuals with strong learning goal orientations typically view feedback as “diagnostic information” which compels them to consider alternative strategies. On the other hand, individuals with strong performance orientations may view feedback as a judgment about their ability. Instead of seeking new ways to improve their performance, these individuals may tend to show less adaptive coping behaviors such as rationalizing, reducing effort, or refusing to continue (VandeWalle, 2001). It is likely then that performance feedback will differentially affect the note taking strategies of students with learning and performance goal orientations.

A substantial course of research has supported these ideas (Diener et al., 1978, Elliott et al., 1988; Richard, 2003). Diener et al. (1978) showed that in the face of repeated failures, mastery oriented children were more resilient and often showed more improvements in effort and strategy than helpless children, who were more likely to withdraw. The researchers measured the global goal orientation of children classified into two groups, helpless and mastery oriented, which roughly correspond to the learning and performance oriented groups previously identified. Children were presented with a series of pattern identification puzzles and asked to answer all items. Feedback was offered after each fourth response to the test problems. Each participant was always told that their responses were wrong. No participant ever received positive feedback. When asked why they were having trouble with the problems, helpless children attributed their failures to lack of ability significantly more often than mastery oriented children who focused more on issues of effort, luck and fairness. Of particular significance to the current research, was the finding that helpless children used progressively fewer legitimate strategies as they continued to receive negative feedback while mastery oriented children were consistently invested in finding and using useful strategies. This phenomenon supports the idea that the relationship between goal orientation and notetaking strategy may be affected by feedback received from the environment.

In a related study, Elliott et al. (1988) extended these findings to suggest that the pattern of differential response to failure between learning and performance goal orientations exists even when goal orientation is manipulated by experimental conditions. The researchers hypothesized that individuals with different goal orientations would respond differently to difficulty depending on the type of feedback that they had received about their past performances. Following a procedure similar to the one used by Diener et al. (1978) ten years earlier, they examined the

effect of negative feedback and other variables on future task choice and assessment performance. In this experiment however, some students received failure feedback while others received success feedback. The experiment created four conditions: Learning Goal-Success Feedback, Learning Goal-Failure Feedback, Performance Goal-Success Feedback and Performance Goal-Failure Feedback. Interestingly, individuals with learning goals continued to show a mastery-oriented response both when they were faced with failure and when they received successful feedback. When given negative feedback about their past performance, individuals with performance goals responded to difficulty with helpless behaviors such as deterioration in problem solving, and negative affect. When they received positive feedback about their past performances, individuals with performance goal orientations showed mastery responses similar to those with learning orientations. Elliot and Dweck suggested that a probable reason for this response to feedback was the change in the children's perception of their ability. When children with performance goals believe that they have low ability, they respond to difficulty by withdrawing from the task or making attributions about their failure to their poor ability. When individuals with performance goals believed that they had strong ability, their strategy use improved over the course of three trials more often than the strategy use of individuals with learning goal orientations who received the same feedback.

These results are relevant to the present experiment because they provide evidence that goal orientation can have far-reaching effects on the learning process. If teachers can reframe the classroom culture (by manipulating goal orientation), they may be able to influence the way that students approach tasks, what strategies students use to enhance their learning, and how those students respond when they receive feedback about their performance in a given course.

Research supporting these ideas could have implications for curriculum design and classroom practice.

Purpose and Research Questions

This dissertation explored the relationship between students' motivation and their note taking habits. Although other research has examined the impact of goal orientation on strategy use, most previous researchers have relied on surveys and questionnaires to measure student behavior. The present research is unique in that it is the only study known to the author to examine the effects of goal orientation on the specific study strategy of notetaking. Further, it is also the first study to explore the relationship between goal orientation and the quantity of students' notes through the use of an experimental design. Instead of depending on student self-report, the experimenter created different goal orientation conditions and measured student note quantity in a more authentic academic situation. Specifically, participants were given opportunities to take notes from videotaped lectures under these various motivational conditions. They were then tested on material from this lecture. After receiving feedback about their performance on this initial assessment, students were given opportunity to take notes from a second lecture and tested a second time.

This study attempts to further the findings of past researchers who have isolated some of the factors creating individual differences in note taking by investigating four principal research questions: (1) Do students with different goal orientations include different numbers of idea units in their notes? (2) Do students with different goal orientations include different numbers of idea units in their written summaries? (3) Do students with different goal orientations produce different numbers of idea units in their notes in response to different feedback? (4) Do students with different goal orientations produce different numbers of idea units in their written

summaries in response to different feedback? Based on previous research, it is also hypothesized that H1) Female students will include more idea units in their notes; and that H2) Students who include more idea units in their notes will tend to include more idea units in their written summaries.

Chapter III

Methods

Participants

All participants were recruited in accordance with institutional review board procedures. Participants were undergraduate students from a public university in the northeastern United States. All were enrolled in an introductory educational psychology course. Participants were recruited through an in-class announcement and were offered extra course credit equivalent to 2% of their final grade in the class in which they were enrolled. Although students were informed that they could also earn extra credit by choosing to complete a short assignment instead, all students choose to participate in the experiment.

Initially, 234 students agreed to participate in the experiment; however, three participants were excluded from the sample because English was not their first language. The total sample used for these analyses included 231 participants. The mean age for the sample was 19.39 years ($SD=1.01$) and ranged from 18.34 to 27.30 years. Eighty-three percent ($n=191$) of the sample was female. Race/ethnicity reported by participants was as follows: White American (94.8%), Black/African-American (1.7%), Asian American/Pacific Islander (1.3%), Latino/a (.4%), and Other (1.7%). Ninety-eight percent had taken at least one psychology course.

Materials and Scoring

The materials consisted of: a demographics and motivation questionnaire, a goal-priming directions sheet, two videotaped lectures on the psychology of problem solving, two word search puzzles, two written recall tests, a feedback sheet, and a manipulation check. All measures were group administered. Inter-rater agreement in scoring was used to establish reliability for item scores on measures of idea units included in notes and written summaries across 40 randomly

chosen protocols and ratings from four independent graduate student raters. Inter-rater agreement for the notes and the written summary was assessed by calculating Cohen's Kappa measure of agreement between each pair of raters. The average Kappa was calculated to be .822, with all Kappa's greater than .815. Disagreements were settled by consensus.

Demographics and Motivation Questionnaire

A simple questionnaire was used to collect students' information across a variety of demographic variables, including gender, age, and ethnicity. There were also three questions aimed at measuring students' trait goal orientation, opinions about the importance of note taking, and appraisal of their own note skill. Each of these questions allowed students to place themselves into one of three groups that best described their ability or behavior. Information gathered on this questionnaire was later used to explore differences in students' note taking habits and performance by group. See Appendix A.

Goal Priming Directions

In order to create three distinct state goal orientation groups, students were presented with differential directions before listening to the lecture that primed them for their randomly assigned goal group. This technique was adapted from previous research that used different directions to change the way that participants view the same task (Elliot & Harackiewicz, 1996; Elliot et al., 1999). Each page of directions consisted of a paragraph outlining the task and a second paragraph which emphasized a specific goal orientation. Students who were in the learning goal group read directions asking that they "Just do your best to listen and learn as much as you can." The process of learning and personal growth was emphasized more than performance on the measure of learning. Students in the performance approach group read directions asking that they listen to the lecture and "Do your best to take as many notes as necessary to achieve a

passing grade from the review panel.” Achieving success was emphasized above learning goals. Finally, students in the performance avoidance group were asked to listen to the lecture and “Do your best to take as many notes as necessary to avoid receiving a failing grade from the review panel.” Here, the goal of avoiding failure was emphasized. Copies of each type of directions have been included in Appendix B.

Lecture Notes

The lectures presented to participants in this study were adapted from Brobst (1996) and Peeverly et al. (2007). The videotaped lectures, read from a prepared text by Dr. Stephen T. Peeverly at a rate of 2.04 words per second, were approximately 8 (Phase I) and 12 (Phase II) minutes long and summarized basic concepts and research about the psychology of problem solving. The content of the lectures was adapted from a chapter by James Voss (1989) titled “Problem Solving and the Educational Process,” from a book designed for use in an undergraduate course in educational psychology (Brobst, 1996).

The method used to score students’ lecture notes was also adapted from Brobst (1996) and Peeverly et al. (2007). Although the scoring of the notes in the present study followed similar rules, there were some changes that should be noted. These changes were necessary due to the fact that while the original study used the lecture in its entirety, the present study used excerpts from the same videotaped lecture in a two-part experiment. The difference necessitated an adjustment in the scoring method to allow for an accurate measuring of note quantity. A full explanation is included below.

In Peeverly et al., The videotaped lecture was approximately 23 minutes long. Participants were given sheets of paper and asked to take notes during the showing of the lecture. They were also informed that they would be allowed 10 minutes to study their notes in preparation for an

essay test later in the study. Participants' notes were scored both for quantity and quality.

Within the lecture, there were 15 identified content areas. Quantity scores could range from 0 to 15 and reflected the number of these content areas that students mentioned in their notes.

Quality scores reflected the total of the ratings (0-3) given to each of the 15 items mentioned. A rating of 0 was given for incorrect or missing information, a rating of 1 was given if a topic was mentioned but not elaborated, a rating of 2 for an incomplete explanation, and a rating of 3 for a complete explanation. Quality scores could range from 0 to 45.

In the current dissertation, the same videotaped lecture was presented in shorter excerpts of approximately 8 minutes (Phase I) and 12 minutes (Phase II). Participants were given paper and asked to take notes. They were also informed that they would be allowed 7 minutes to study their notes in preparation for an essay test later in the study. Participants' notes were scored for quantity only. Within each lecture, a set number of idea units were identified (32 in Lecture 1 and 35 in Lecture 2). Quantity scores reflected the number of idea units that students identified in their notes. Quantity scores ranged from 0 to 32 (or 35).

Although the scoring method for each study may seem different, they represent very similar ways of viewing the data. Both methods award points based on the number of idea units included in the notes, however the current dissertation skips the step of organizing idea units by content areas and awards points individually instead of grouping them.

The scoring method was altered because the Brobst study used the lecture in its entirety while the current dissertation presented portions of the same lecture over the course of two phases of the study. When the original Brobst lecture was split into two parts, it was revealed that the Brobst scoring rubric that was used to score the notes was imbalanced between the two halves of the lecture. Specifically, the Brobst rubric provided many more opportunities to earn

points in the first half of the lecture than in the second half. Although this method of scoring was appropriate when scoring the notes taken on the entire lecture, it was inappropriate for the present study.

Using the Brobst rubric in the present study would have created an imbalance between the two portions of the lecture that would have clouded the analysis of the variables to be studied. In the original Brobst scoring rubric, some sections of the rules did not allow students to earn points for certain details that they mentioned because there were more than three details that supported certain content areas. In these situations, Brobst and Peverly et al. gave students only one point for including information out of a set list of details, rather than giving points for each detail included. The result was to truncate the scores by limiting the amount of points that a student could get for including certain details.

The rubric used in this dissertation does not use the content area system from the Brobst and Peverly et al. experiments. Therefore, it is not necessary to disallow points in order to have an even value for each content area. The result was to increase the amount of possible points to be earned, from 45 points in the Brobst rubric to 67 in the current rubric. With this adjustment, the researcher was able to overcome the issue of imbalanced scoring created by the Brobst rubric, while still measuring note quantity.

Written Summary

In each phase of the experiment, participants were instructed to write an organized summary of the videotaped lecture without referring to their notes. They were allowed 15 minutes and given two sheets of paper for the task. The same method and criteria used for scoring the notes was used to score the written summaries. Participants were awarded 1 point for every idea unit that they included in their written summaries. Quantity scores reflected the total

number of idea units that students identified. Quantity scores ranged from 0 to 32 for the first written summary and 0 to 35 for the second written summary.

Word Search Puzzles

In order to minimize any effect of short term memory before the written summary, participants were asked to complete a word search puzzle between the period when they were allowed to study their notes and the writing portion of the session. Participants were given a matrix of letters and asked to find 12 simple words. They were given a total of 3 minutes to complete the tasks.

Feedback Sheet

In phase II, participants were given contrived feedback about their performance on the written summary that they wrote in phase I. Participants randomly assigned to receive positive feedback read a short letter at the end of their phase II packets stating that the written summary that they wrote in phase I had been reviewed and judged as “Above Standard” by a group of reviewers. Participants randomly assigned to receive negative feedback read a short letter at the end of their phase II packet stating that the written summary they wrote in phase I had been reviewed and judged as “Below Standard” by a group of reviewers. No further elaboration was given. Copies of the contrived letters that participants received are included in Appendix C.

Manipulation Check

In the final step of phase II, students were asked to record what they felt that their specific goal was as stated by the directions that they were given. This was done to establish support for whether or not the manipulation of goal orientation had been effective. Specifically, they were asked to “Please check the statement that most closely represents that goal you were given when listening to the lectures and responding to the essay questions.” Options included

“Learn as much as you can,” “Succeed in passing the exam,” and “Avoid failing the exam,” to correspond to the three goal orientation conditions. Analysis showed that 72 percent of participants were able to correctly identify their assigned motivational condition. It is notable that participants in the performance avoidant goal orientation condition identified their assigned motivational group at lower rates than participants in other conditions. While 62 participants (78.5%) in the performance approach goal orientation condition and 56 participants (77.8%) in the learning goal orientation condition correctly identified their assigned group, only 44 participants (58.7%) in the performance avoidant group were able to do so. This may have been due to a perceived social stigma of holding a performance avoidant goal orientation. All participants were included in the analysis regardless of their ability to correctly identify their motivational condition.

Procedure

Participants completed all measures over the course of two one-hour sessions that took place approximately one week apart. In phase I, participants received a packet including a short demographics and goal orientation form, written instructions for the experiment, and several lined pieces of paper to be used for taking notes and writing a summary of what they heard, and a short word search puzzle. After a brief orientation to the procedure, students were asked to fill out the demographic and goal orientation questionnaire. Students were then primed for one of the three goal orientation groups (learning, performance approach, and performance avoidant), by reading directions printed in their packets that differed depending on which group they had been randomly assigned to. This process took approximately 15 minutes in total. All participants were then asked to watch a videotaped lecture and to take notes on the content in preparation for an assessment task to follow. The video in phase I was approximately 8 minutes

long. When the lecture was over, the students were given an additional 7 minutes to review their notes. They were then given three minutes to complete a short word search puzzle. After the word search puzzle, they were asked to write a summary of the lecture that they had heard. Students had 15 minutes to construct a detailed summary of the lecture content. At the end of the writing period, the packets were collected and the participants were dismissed, but asked to return for the second portion of the experiment (phase II).

Beginning phase II, students in each group were further divided, with half of the students in each group assigned at random to a positive performance feedback group and the other half assigned to a negative performance feedback group. After a brief welcome and re-orientation, participants were instructed to read a short letter attached to their packet that contained their contrived feedback. According to their assignments, students in the each performance feedback groups were told that they received either a passing or failing review on the written assessment. Following the introduction of feedback, a procedure very similar to phase I was used. Participants again read instructions that corresponded to their goal orientation groups. Students listened to lectures, took notes, and wrote summaries as they had done in phase I. When they finished with their summaries, they were also asked to complete the manipulation check questionnaire to see if they could remember what their instructions were. At the end of the exercise, the packets were collected and participants were debriefed and thanked for their participation. A timetable of these events is included in Appendix D.

Research Design

This research used an experimental design to explore relationships between college students' goal orientations, their response to feedback, their note taking habits, and their performance on a measure of their learning. The experiment consisted of two between-subjects

factors – goal orientation and feedback. Goal orientation had three levels, learning, performance approach, and performance avoidant. The feedback variable had two levels, positive and negative. The primary dependent variables were quantity of idea units in students' notes and quantity of idea units in students' written summaries.

Chapter IV

Results

The current study was designed to investigate four principal questions: (1) Do students with different goal orientations include different numbers of idea units in their notes? (2) Do students with different goal orientations include different numbers of idea units in their written summaries? (3) Do students with different goal orientations produce different numbers of idea units in their notes in response to different feedback? (4) Do students with different goal orientations produce different numbers of idea units in their written summaries in response to different feedback? Based on findings from previous research, it was also hypothesized that H1) Female students would include more idea units in their notes than male students; and that H2) Students who included more idea units in their notes would tend to include more idea units in their written summaries. The dependent variables were quantity of idea units included in students' notes and quantity of idea units included in students' written summaries in phase I and phase II. Tables 1 and 2 contain the means, standard deviations, and ranges of scores in the sample. All variables met assumptions of normality.

Table 1*Means and Standard Deviations in Phase I*

	Notes			Written Summary		
Independent Variable	Mean	Std. Dev.	Range	Mean	Std. Dev.	Range
Learning	16.69	4.533	6-25	11.14	3.939	5-23
Performance Approach	16.38	3.740	5-27	11.40	4.215	2-22
Performance Avoidant	16.55	3.949	6-24	11.31	3.908	2-19
Male	14.76	4.570	5-23	10.37	4.564	2-19
Female	16.90	3.882	6-27	11.51	3.878	2-23

Table 2*Means and Standard Deviations in Phase II*

	Notes			Written Summary		
Independent Variable	Mean	Std. Dev.	Range	Mean	Std. Dev.	Range
Learning with Positive Feedback	18.51	5.554	9-28	9.43	2.943	3-16
Learning with Negative Feedback	16.97	4.543	8-26	8.84	3.219	3-16
Performance Approach with Positive Feedback	17.68	5.762	1-29	9.63	3.966	2-19
Performance Approach with Negative Feedback	19.15	4.738	9-28	9.21	3.097	4-19
Performance Avoidant with Positive Feedback	19.63	3.907	11-27	9.55	2.617	5-15
Performance Avoidant with Negative Feedback	18.38	4.991	9-30	8.65	2.898	4-16
Male	16.11	5.611	1-28	8.92	2.812	2-14
Female	18.85	4.755	8-30	9.29	3.222	3-19

Main Analyses

Intercorrelations among the independent and dependent variables within the total sample are presented in Table 3. Phase I note quantity was significantly correlated to phase I essay quantity (.530, $p < .01$), phase II note quantity (.526, $p < .01$), and phase II essay quantity (.265, $p < .01$), and significantly negatively correlated with gender (-.192, $p < .01$). Phase I essay quantity was significantly correlated with phase II note quantity (.389, $p < .01$) and phase II essay quantity (.486, $p < .01$), and significantly negatively correlated with gender (-.133, $p < .05$). Phase II note quantity was significantly correlated with phase II essay quantity (.497, $p < .01$) and significantly negatively correlated with gender (-.192, $p < .01$).

Table 3

Intercorrelations Among the Independent and Dependent Variables

	1	2	3	4	5	6	7	8
1. Phase I Note Quantity	--							
2. Phase I Essay Quantity	.530**	--						
3. Phase II Note Quantity	.526**	.389**	--					
4. Phase II Essay Quantity	.265**	.486**	.497**	--				
5. Perform Approach GO	-.028	.021	.002	.046	--			
6. Perform Avoidant GO	.002	.005	.089	-.026	-.515**	--		
6. Feedback	-.067	.028	-.041	-.101	.003	-.006	--	
7. Gender	-.192**	-.133*	-.192**	-.056	-.012	-.023	-.083	--

* $p < .05$ ** $p < .01$

Quantity of Idea Units in Notes

Regression analyses using the enter method were used to evaluate which variables contributed significantly to note quantity. In order to produce the most parsimonious regression model, variables that were not found to significantly predict note quantity were removed.

In the first regression analysis, quantity of Phase I notes was regressed on goal orientation, gender, and their interactions. In order to produce the most parsimonious regression model, variables that were not found to significantly predict note quantity were removed. The resulting regression equation was significant (tolerance and variance inflation factor values were within acceptable limits; $R=.198$, $R^2=.039$, $R^2_{\text{adjusted}}=.035$; $F(1,229)=3.989$, $p<.005$). Gender was found to be the only significant predictor of Phase I note quantity. This finding supported the initial hypothesis. Female students included more idea units in their notes than male students ($\beta = .198$, $p < .005$).

In the second regression analysis, quantity of Phase II notes was regressed on goal orientation, gender, feedback group, and their interactions. The resulting regression equation was significant ($R=.320$, $R^2=.102$, $R^2_{\text{adjusted}}=.078$; $F(6, 219)=4.156$, $p<.01$). It is important to note, however, that variance inflation factors for several of the variables included in this analysis were high, suggesting a degree of multicollinearity. Therefore, the results must be interpreted with caution. Gender, performance approach goal orientation, their interaction, and the interaction of feedback group and performance approach goal orientation, were found to predict quantity of Phase II notes. Again, female students tended to include more idea units in their notes than male

students ($\beta = .501, p < .05$). This finding further supported the initial hypothesis that female students take more notes than male students.

Although the main effect for performance approach goal orientation was shown to predict note quantity ($\beta = -.860, p < .005$), additional interactions within the model provide a more nuanced picture. Given that the interaction of gender and performance approach goal orientation was also found to be significant ($\beta = .375, p < .05$), it is likely that performance approach partially moderates the relationship between the gender and note quantity. The graph in Figure 1 shows that males who were in the performance approach group recorded fewer idea units in their notes than males in other conditions. The category labeled “other” represents a composite of data from males in both the learning and performance avoidant groups. The two groups were not significantly different from each other and were therefore represented as a single group for clarity. Although men were differentially impacted by performance approach goal orientation, this pattern was not observed among women, who were not significantly affected by any of the goal orientation conditions.

The interaction between feedback group and performance approach goal orientation was also found to be significant ($\beta = .555, p < .01$). Among those who were in the performance approach group, receiving negative feedback led to higher quantities of phase II notes than receiving positive feedback. Among those who were not in the performance approach group, the opposite was true; receiving positive feedback led to significantly higher quantities of phase II notes than receiving negative feedback (Figure 2).

Figure 1

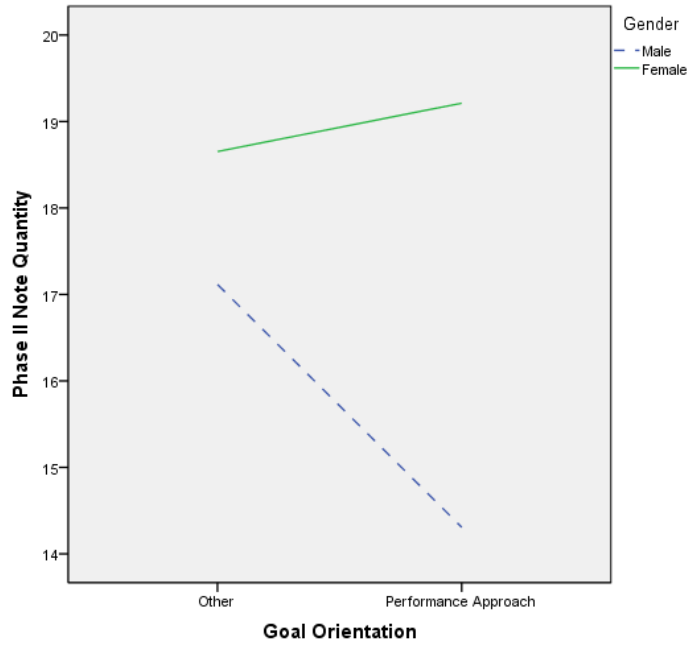
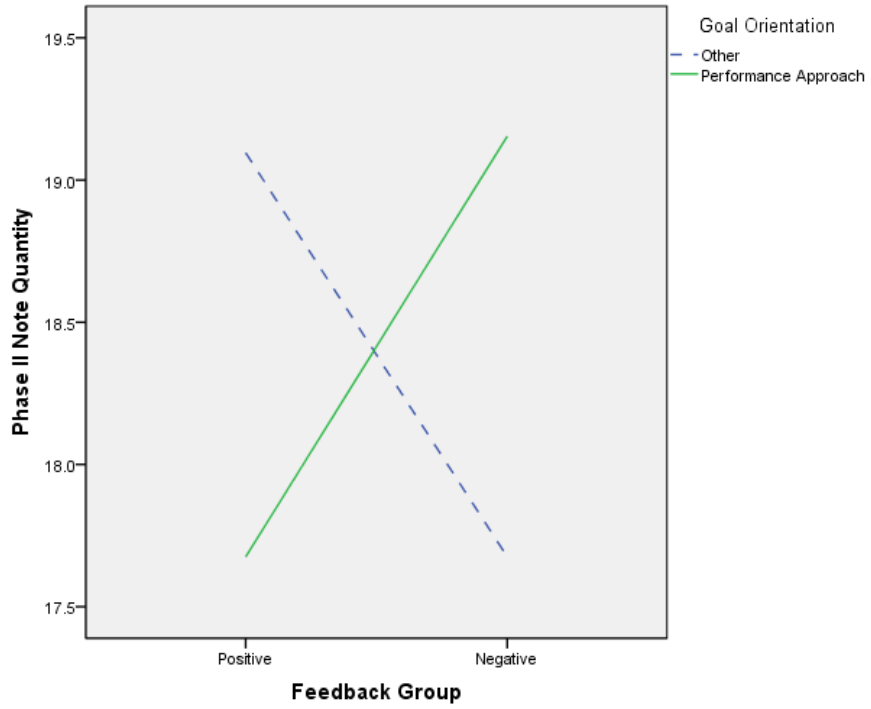


Figure 2

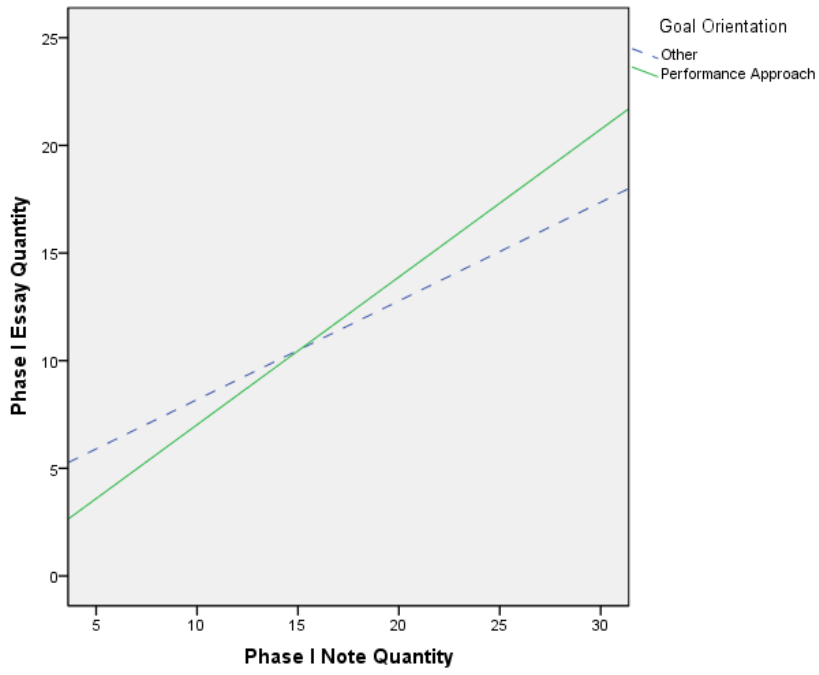


Quantity of Idea Units in Written Summaries

Regression analyses using the enter method were also used to evaluate which variables contributed significantly to quantity of idea units included in students' written summaries. In the first regression analysis, quantity of idea units included in phase I written summaries was regressed on goal orientation, gender, phase I note quantity, and their interactions. The resulting regression equation was significant (tolerance and variance inflation factor values were within acceptable limits; $R=.561$, $R^2=.315$, $R^2_{\text{adjusted}}=.299$; $F(5,225)=20.652$, $p<.001$). Performance approach goal orientation ($\beta = .365$, $p < .01$), quantity of idea units included in phase I notes ($\beta = .440$, $p < .001$), their interaction ($\beta = .158$, $p < .05$), and the interaction of performance approach goal orientation and gender ($\beta = -.374$, $p < .05$) were found to predict quantity of idea units in phase I written summaries. Students with performance approach goals tended to include more idea units in their written summaries. As was hypothesized, students who had included more idea units in their notes also tended to include more idea units in their written summaries.

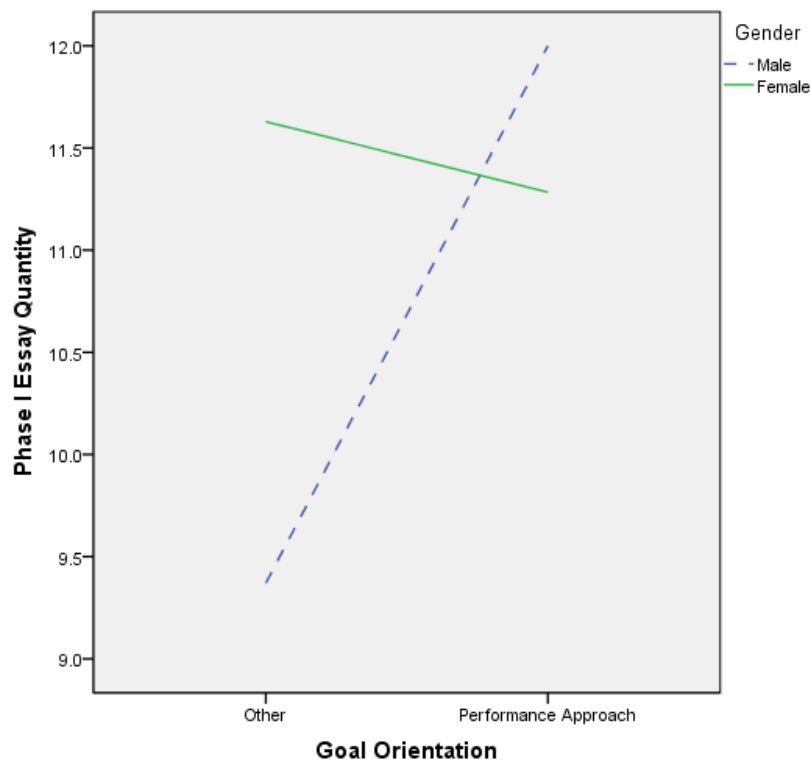
Interestingly, the relationship between quantity of idea units in phase I written summary and quantity of idea units in phase I notes was moderated by performance approach goal orientation. Among students who included fewer idea units in their notes, those students in the performance approach goal orientation group included fewer ideas in their written summaries than students who were in the learning goal orientation group; however, among students who included more idea units in their notes, students in the performance approach goal orientation group included more idea units in their written summaries than students in the learning goal orientation group (Figure 3).

Figure 3



The relationship between performance approach goal orientation and quantity of idea units included in phase I essay quantity was moderated by gender. Men in the performance approach goal orientation group included more idea units in their essays than men who were not in the performance approach group. This pattern was not observed among women. See Figure 4.

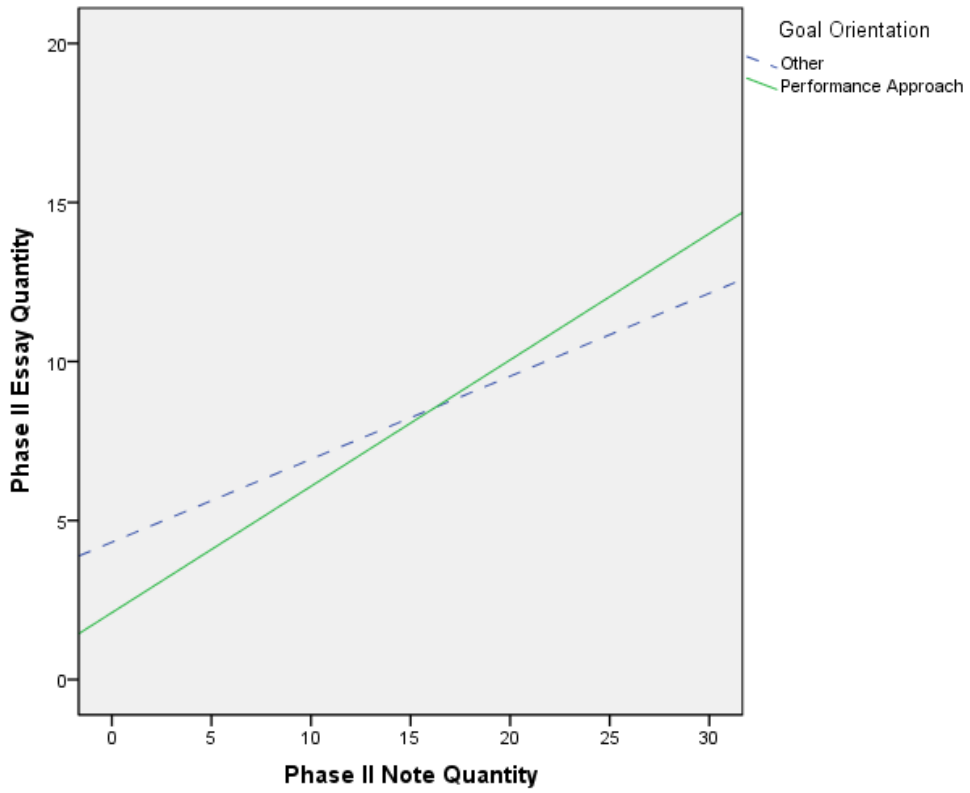
Figure 4



In the second regression analysis, quantity of idea units in phase II written summaries was regressed on goal orientation, gender, feedback group, phase II note quantity, and their interactions. The resulting regression equation was significant (tolerance and variance inflation factor values were within acceptable limits; $R=.519$, $R^2=.269$, $R^2_{\text{adjusted}}=.253$; $F(5,220)=16.231$, $p<.001$). Quantity of phase II notes ($\beta = .414$, $p < .001$) and the interaction between quantity of phase II notes and performance approach goal orientation ($\beta = .169$, $p < .05$) were found to predict quantity of idea units in phase II written summaries. Again, the hypothesized relationship between student note quantity and the amount of idea units included in their written summaries was observed. Students who included more idea units in their notes tended to include more idea units in their written summaries.

The relationship between number of idea units included in students' notes and the number of idea units included in their written summaries was moderated by performance approach goal orientation. Among students who included fewer idea units in their notes, those students in the performance approach goal orientation group included fewer ideas in their written summaries than students who were in the learning goal orientation group; however, among students who included more idea units in their notes, students in the performance approach goal orientation group included more idea units in their written summaries than students in the learning goal orientation group. See Figure 5.

Figure 5



Supplementary Analyses

The focus of this dissertation was to explore the impact of different goal orientations and feedback on students' note taking habits. In the present study, the researcher chose to manipulate students' goal orientations for the purpose of determining this effect. This was done by giving different directions to students in each experimental condition. This practice has been supported by previous studies that manipulate participants' goal orientations in experimental conditions by giving them different directions on how to approach the same task (Elliot et al., 1996). It should be noted however, that other researchers have taken a different approach to the construct of goal orientation, choosing to measure students' global "trait" goal orientation rather than manipulate their "state" goal orientation in a specific situation. For example, Meece et al. (1988) surveyed 5th grade students about their goal orientations during specific periods of class. VandeWalle et al. (1997) surveyed university students with a 50-item questionnaire designed to determine their goal orientations. It is possible that students' trait goal orientations may play a role in their note taking behavior that is different from the manipulated "state" goal orientation that is used in the main analyses of this dissertation.

Although the researcher chose to focus on "state" goal orientation, several supplementary analyses were done to investigate the merits of "trait" goal orientation as a possible predictor of the amount of idea units included in students' notes and essays. On the demographics and goal orientation questionnaire, there was one question asking students to describe their own trait goal orientation by placing themselves in one of three categories which corresponded to each of the three goal orientation categories: learning, performance approach, performance avoidant.

Several students endorsed more than one category of trait goal orientation. Based on these categories, a trait goal orientation variable was created and used in the following analyses to explore the possibility that trait goal orientation may predict the amount of idea units included in students' notes and essays. A fourth "multi-goal" level of the trait goal orientation variable was added to the dataset to include those participants who endorsed more than one trait goal orientation option. A total of 62 participants (26.8%) endorsed the learning trait goal orientation, 154 participants (66.7%) endorsed the performance approach goal orientation, 7 participants (3.0%) endorsed the performance avoidant trait goal orientation, and 8 participants (3.8%) endorsed multiple trait goal orientations. The regressions below will refer to the new supplementary variable as "trait goal orientation."

Quantity of Idea Units in Notes

Trait goal orientation was added to the regression equations used in the main analyses to evaluate which variables contributed significantly to note quantity. In the first regression analysis, quantity of Phase I notes was regressed on trait goal orientation, gender, and their interactions. The resulting regression equation was significant (tolerance and variance inflation factor values were within acceptable limits; $R=.290$, $R^2=.084$, $R^2_{\text{adjusted}}=.076$; $F(2,228)=10.455$, $p<.001$). Gender was again found to be a significant predictor of Phase I note quantity ($\beta = .192$, $p < .01$). Female students tended to include more idea units in their notes than male students. Performance approach trait goal orientation was also found to be a significant predictor of phase I note quantity ($\beta = -.211$, $p < .01$). Participants who rated themselves as having performance approach trait goal orientations tended to record fewer idea units in their notes than students who did not rate themselves as having performance approach trait goal orientations.

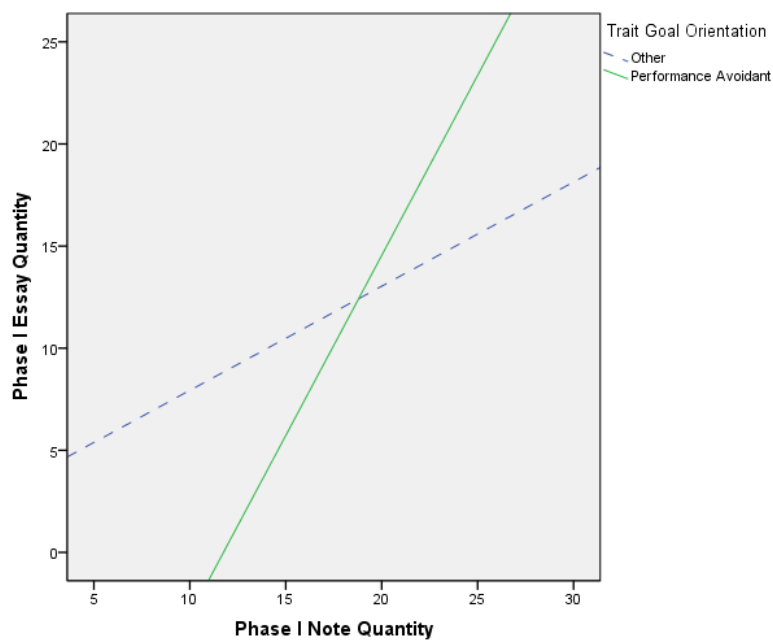
In the second regression analysis, quantity of Phase II notes was regressed on trait goal orientation, gender, feedback group, and their interactions. The regression equation was significant (tolerance and variance inflation factor values were within acceptable limits; $R=.203$, $R^2=.041$, $R^2_{\text{adjusted}}=.037$; $F(1, 224)=9.642$, $p<.005$). Gender was found to predict quantity of Phase II notes. Female students tended to include more idea units in their notes than male students ($\beta = .203$, $p < .01$).

Quantity of Idea Units in Written Summaries

Regression analyses using the enter method were also used to evaluate which variables contributed significantly to quantity of idea units included in students' written summaries. In the first regression analysis, quantity of idea units included in phase I written summaries was regressed on trait goal orientation, gender, phase I note quantity, and their interactions. The regression equation was significant (tolerance and variance inflation factor values were within acceptable limits; $R=.543$, $R^2=.295$, $R^2_{\text{adjusted}}=.286$; $F(3,227)=31.687$, $p<.001$). Quantity of phase I notes was found to predict quantity of idea units in phase I written summaries ($\beta = .517$, $p < .001$). Students who included more idea units in their notes tended to include more idea units in their written summaries. Interestingly, the relationship between the amount of idea units included in students' notes and the amount of idea units included in their written summaries was moderated by performance avoidant trait goal orientation. The interaction between quantity of phase I notes and performance avoidant trait goal orientation was found to be significant ($\beta = .188$, $p < .05$). Among individuals who recorded relatively few idea units in their phase I notes, those who rated themselves as having a performance avoidant trait goal orientation included fewer idea units in their phase I written summaries than those who did not rate themselves in this group. However, among individuals who recorded higher numbers of idea units in their phase II

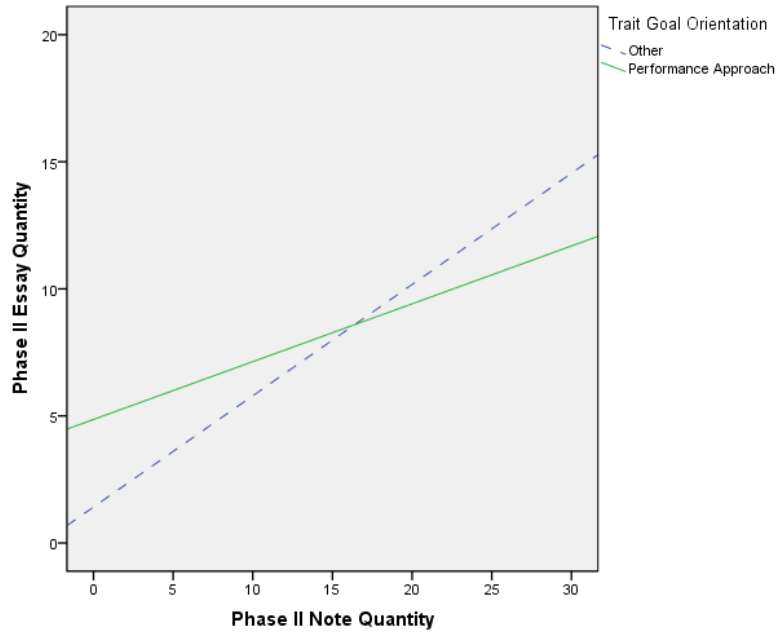
notes, those who rated themselves in the performance avoidant group included more idea units in their written summaries than individuals who were not in this group. This result must be interpreted with caution due to the small number of people who rated themselves in the performance avoidant group (n=7). See Figure 6.

Figure 6



In the second regression analysis, quantity of idea units in phase II written summaries was regressed on trait goal orientation, gender, feedback group, phase II note quantity, and their interactions. The regression equation was significant (tolerance and variance inflation factor values were within acceptable limits; $R=.528$, $R^2=.279$, $R^2_{\text{adjusted}}=.269$; $F(3,222)=28.566$, $p<.001$). Quantity of phase II notes was found to predict quantity of idea units in phase II written summaries ($\beta = .692$, $p < .001$). Students who included more idea units in their notes tended to include more idea units in their written summaries. The relationship between quantity of idea units in students' notes and the quantity of idea units in their written summaries was moderated by performance approach trait goal orientation. The interaction between quantity of phase II notes and performance approach trait goal orientation was found to be significant ($\beta = -.257$, $p < .01$). Among individuals who recorded relatively few idea units in their phase II notes, those who rated themselves as having a performance approach trait goal orientation included more idea units in their phase I written summaries than those who did not rate themselves in this group. However, among individuals who recorded higher numbers of idea units in their phase II notes, those who rated themselves in the performance approach group included fewer idea units in their written summaries than individuals who were not in this group. See Figure 7.

Figure 7



Summary

In summary, the data suggest that factors related to gender, goal orientation, and feedback did impact students' note taking quantity. Women tended to include more idea units in their notes than men consistently across all trials. Additionally, participants who included more idea units in their notes tended to include higher quantities of idea units in their written summaries. In phase II, males who were in the performance approach goal orientation group recorded fewer notes than males in other conditions. Results from phase II also revealed that among those who were in the performance approach group, receiving negative feedback led to higher quantities of phase II notes than receiving positive feedback, while the opposite was true for those who were not in the performance approach group. For them, receiving positive feedback led to significantly higher quantities of phase II notes than receiving negative feedback.

Supplementary analyses were included to explore the possible impact of trait goal orientation on notetaking habits. In phase I, participants who rated themselves as having performance approach trait goal orientations tended to record fewer idea units in their notes than students who did not rate themselves in this group. Further analysis indicated that in both phase I and phase II, trait goal orientation may play a key role in moderating the relationship between note quantity and quantity of idea units included in written summaries. In phase I, performance avoidant trait goal orientation moderated this relationship, while in phase II, performance approach trait goal orientation played a similar role. These results and their implications for future research will be discussed in detail in the following chapter.

Chapter V

Discussion

The importance of note-taking to the learning process has been highlighted through research and anecdotal reports from teachers and students (Armbruster, 2009; Palmatier et al., 1974; Peverly et al., 2007). Research has repeatedly confirmed that students who take or review notes consistently outperform those who do not use this strategy (Barnett et al., 1981; Di Vesta et al., 1972; Kiewra, 1989; Kobayashi, 2005; Nye et al., 1984; Slotte et al., 1999). Past research has explored factors that create individual differences in note quality, identifying such cognitive factors as working memory, cognitive style, and prior knowledge (Armbruster, 2009; Peverly et al., 2007).

This dissertation explored the suspected relationship of the construct of goal orientation, the student's reason for participating in a task, to lecture note taking. Several studies indicate that goal orientation can affect strategy use and other task related behaviors (VandeWalle et al., 2001; Wolters, et al., 1996). Viewing note taking as an academic strategy, it is possible that goal orientation could impact students' use of the technique. This dissertation was the first study to examine this potential relationship through the use of an experimental design that involved having participants engage in the act of taking notes.

While previous studies relied on student self-report questionnaires, the experiment described in this dissertation involved creating different goal orientation conditions and measuring student note quantity in a more authentic academic situation. Specifically, participants were given opportunities to take notes from videotaped lectures under various motivational conditions. They were then tested on material from this lecture. After receiving feedback about their performance on this initial assessment, students were given opportunity to

take notes from a second lecture and tested a second time. The dependent variables were note quantity and written recall. The independent variables included goal orientation, gender, and feedback. A discussion of the significant results is presented below, followed by implications for education, directions for future research, and consideration of limitations of the study.

Note Quantity

Goal orientation, gender, and feedback were all explored as possible predictors of note quantity. Although gender is often overlooked as an important variable in motivation literature, some recent studies examining notetaking habits have included it (Peeverly et al. 2007; Reddington, 2011). Based on this previous research it was hypothesized that gender would predict the quantity of idea units included in students' notes, with female students including more idea units in their notes than male students.

This hypothesis was confirmed. In both phase I and phase II, a statistically significant relationship was found between gender and the amount of idea units that students included in their notes. In both cases, female students tended to have higher note quantities than male students. These results support previous findings by Reddington et al. (2006) and Reddington (2011), who found that women tend to take more notes. Analyses in these studies pointed to some cognitive variables, such as transcription speed, writing fluency, fine motor dexterity, verbal ability, and working memory as factors contributing to the differences in notetaking habits of men and women.

Research also suggests that not only are there differences in notetaking habits by gender, but that the variables that predict notetaking habits are different for males and females (Reddington, 2011). While verbal ability and working memory appeared to predict note quality among females, these relationships were not observed among men in the Reddington (2011)

study. Results from this dissertation extend the idea that the note-taking habits of men and women are impacted differently by certain variables. Specifically, while results from phase II suggest that performance approach goal orientation is associated with lower note quantities when compared to the remainder of students in other goal orientation conditions, it was revealed, within the same analysis, that the significant relationship between phase II note quantity and performance approach goal orientation was moderated by gender. Among men, taking notes under the performance approach goal orientation condition was associated with reduced quantities of notes in phase II; however, women were not significantly impacted by membership in any of the three goal orientation groups. This trend among men, which suggests that males who have a performance approach goal orientation tended to take fewer notes than males with other goal orientations in phase II appears to conflict with the research of Wolters et al. (1996), Bouffard et al. (1995) and others, whose studies have indicated that students, and in some cases, specifically male students benefit greatly from holding performance approach goal orientations. Wolters et al. (1996) found that students with high learning and performance approach goal orientations are more likely to adopt positive patterns of motivational beliefs and behavior such as high self-efficacy, and increased use of cognitive and self-regulatory strategy use. Bouffard (1995) found that for boys only, performance goals were associated with increased metacognitive strategy use.

Although this dissertation's finding that in phase II, male students in the performance approach group took fewer notes than males in other goal orientation groups seems to run counter to the research mentioned above, it is important to consider these results in the context of our view that note taking is an effortful activity and that past research suggests that students often change their notetaking strategies based on situational factors. Because note taking is an

effortful task, students often adjust their note taking habits to reflect their view of the strategy's utility in a given situation (Locke, 2001; Van Meter et al., 1994). In a study by Locke (2001), students reported that they took more notes when a lecture covered newer material. Van Meter et al., (1994) surveyed undergraduate students and found that they modified their note taking strategy based on specific subgoals, such as wanting to learn, creating study guides outside of class, or focusing their attention (Van Meter et al., 1994). In that same survey, students also reported that they often change their notetaking habits, taking either more or fewer notes based on what they have learned about a professor's testing style from previous assessments. Students in the Van Meter study made statements like, "once you learn what stuff is important, your notetaking changes" and "after you've taken the test, you just listen more and write less. You get to know the professor and what he'll ask." Given that males in the performance approach group recorded fewer notes than males in other groups in phase II, but not in phase I, it is possible that males who were focused on performance approach goals took the opportunity in phase II to adjust their notetaking strategies to be as effective as possible towards helping them earn the highest score possible on the exam to come.

Given the association between performance approach goal orientations and an increased focus on strategies that are important to achieving success on a stated task, it would make sense that males in this study used strategies that would help ensure their success, such as only taking time to write down major concepts in their notes, instead of full, detailed notes. The facts that this shift in note quantity was seen only for men from the performance approach goal orientation condition and that the pattern occurred only in phase II further support this idea. Having the benefit of the previous test, it is plausible that they took the information gained in the experience of the first exam and applied that knowledge to their habits in phase II. Although this pattern of

behavior has appeared in the research, it is unclear why only males in the present study exhibited this behavior. Further research is needed to investigate this idea.

Results from the main analyses also revealed that the relationship between goal orientation and note quantity is moderated by the positive or negative direction of the performance feedback received by participants. Among those who were in the performance approach group, receiving negative feedback led to higher quantities of notes than receiving positive feedback; however, among those who were not in the performance approach group, the opposite was true. For students in the learning goal orientation and performance avoidant goal orientation groups, receiving positive feedback led to significantly higher quantities of phase II notes than receiving negative feedback.

Research suggests that performance feedback can impact individuals' effort and strategy use (Deiner et al., 1978; Elliott et al., 1988; Kluger & Denisi, 1996). However, research investigating the impact on performance feedback on these variables has found many conflicting results indicating that the results of performance feedback can be positive, negative or mixed, depending on circumstances. It is recognized within the literature that there are certain moderators of the effect of performance feedback on effort and strategy use that must be further investigated in order to fully understand the varying findings (Kluger et al., 1996).

The findings of the present study, which indicate that students in the performance approach goal orientation condition who received negative feedback included more idea units in their notes than those in the performance approach group who received positive feedback seem to suggest that those students who were in this group took the negative feedback as a cue that they needed to work harder in order to achieve the standard set by the directions given. They increased their effort, as indicated by strategy use, towards improving their scores. This pattern

fits with findings from previous research suggesting that when confronted by a negative discrepancy between performance feedback received and the performance standard set, individuals may work harder to reduce this discrepancy (Anderson & Rodin, 1989; Campion & Lord, 1982; Kluger et al., 1996,). Bandura and Cervone (1983) note that this tendency to work hard to reduce the negative discrepancy between performance feedback and performance standard is more likely to occur when individuals have a stronger belief that they can achieve the performance standard set. Simply stated, if students believe that they can achieve a performance standard by working harder, they will increase their effort towards this goal, even after receiving negative feedback about their performance. Negative feedback, in this case, could motivate individuals to work harder to achieve a goal that they perceive to be within reach. On the other hand, if the individual does not believe that they have the skills necessary to achieve a goal, receiving negative feedback could result in reduced effort (Bandura et al., 1983).

Revisiting the results of the current study, the clear pattern is that students in the performance approach goal orientation group took more notes than individuals in either of the two other groups when they experienced negative feedback. Understanding that when individuals feel competent to reach a goal, they may react to negative feedback with increased effort towards that goal, helps to partially illuminate the observed pattern of behavior. It is possible that participants in the performance approach group, feeling confident in their abilities as college students to perform appropriately on an essay task that was likely very familiar to them, increased their effort towards the goal of passing the exam by taking more notes because of their self-evaluation as “capable” of performing well on this task. As did the participants in the study by Bandura et al. (1983), these individuals sought to reduce the negative discrepancy between the performance feedback and the performance standard set by increasing effort.

Interestingly, although individuals in the performance approach goal orientation group who received negative feedback took more notes than those who received positive feedback, this did not translate into a significant difference in the performance of the two groups on the writing task.

Written Summaries

Goal orientation, gender, feedback, and note quantity were all explored as possible predictors of the quantity of idea units in written summaries. Based on previous research (Peeverly et al., 2007) it was hypothesized that quantity of idea units included in notes would predict quantity of idea units included in written summaries, with students who include more idea units in their notes including more idea units in their written summaries. As expected, this hypothesis was confirmed. In analyses from both phase I and phase II, note quantity was found to predict the amount of idea units included in students' written summaries, with higher note quantities predicting higher numbers of idea units in written summaries. Previous research by Peeverly, Brobst, Graham, & Shaw, (2003), Peeverly et al. (2007), Keiwra et al. (1991), Titsworth and Kiewra, (2004), and others have found this relationship as well. Keiwra et al. (1991) hypothesized that the encoding, storage, and encoding plus storage functions of notes provide notetakers with clear benefits over those who do not use this strategy. It is likely that participants in this study who took more notes showed stronger test performance as a result of these benefits.

In phase I, a main effect for performance approach goal orientation was found, suggesting that participants in the performance approach goal orientation group recorded significantly more idea units in their written summaries than individuals who were not in this group. Previous research has found similar relationships between performance approach goal

orientation and increased effort and higher task performance (Elliot et al., 1997; Elliot, et al., 1999). It is likely that participants in the present study who were grouped into the performance approach condition were also motivated to work harder to reach the stated performance goal.

Although the main effects for performance approach goal orientation and note quantity support previous findings, they must be interpreted carefully in light of the additional results of this study, which indicate that the significant relationships between performance approach goal orientation and the amount of idea units in students' notes and written summaries are complex. In phase I, the relationship between performance approach goal orientation and quantity of idea units included in phase I essay was moderated by gender. As described earlier, men in the performance approach goal orientation group tended to include more idea units in their essays than men who were not in the performance approach group; however, this pattern was not observed among female participants, who were largely unaffected by membership in the performance approach group. These results are not surprising in light of previous research identifying affective variables such as conscientiousness, attributional style, ability conception, and others which impact the performance of males and females differently (Lievens, Coetsier, De Fruyt, & De Maeseneer, 2002; Reddington, 2011; Wigfield, Eccles, Schiefele, Roeser, & Davis-Kean, 2006). In the present study, male students appeared to be particularly sensitive to the performance approach goal orientation and were significantly impacted by this condition. Future research should continue to investigate this trend.

In both phase I and phase II, a significant interaction of performance approach goal orientation and note quantity suggests that among students who included lower numbers of idea units in their notes, those students in the performance approach goal orientation group included fewer ideas in their written summaries than students who were not in this group; however,

among students who included higher numbers of idea units in their notes, students in the performance approach goal orientation group included more idea units in their written summaries than students not in this group. It seems that for students with lower skills, performance approach goal orientation can negatively impact performance, while for students with higher skills, performance approach goal orientation can enhance relative performance. Research by Elliott et al. (1988), Bandura et al. (1983), and others suggests that this pattern may be related to perceived competence among individuals. Elliot et al. (1988) found that among individuals with performance goals, the individual's beliefs about their own abilities to perform well on a task greatly influences their approach to the task. Their experimental analysis revealed that individuals with performance approach goals who believed that their abilities were high respond to challenging tasks by persisting and working hard to succeed. Individuals with performance approach goals who believed that their abilities were low responded with withdrawal, lowered effort, and negative affect.

Given the pattern of response to high or low ability concept shown by individuals in the performance approach group, it would seem that the pattern would carry through to impact performance within this group. It is possible that participants who took fewer notes had correspondingly low appraisals of their own ability to perform well on the performance task and were negatively impacted by their beliefs. Participants who took more notes likely believed that their abilities to perform well on the essay task were good and were motivated further to give their best effort. Further research should continue to investigate this pattern.

Trait Motivation

Although the major focus of this dissertation was on examining state goal orientation as a possible predictor of the amount of idea units included in students' notes and essays several

supplementary analyses were done to investigate the impact of trait goal orientation on individual differences in student notetaking. These analyses very closely resembled the analyses used in the main analyses section, with the exception of using trait goal orientation variables in place of the state goal orientation variables. As expected, many of the relationships observed in the main analyses were also observed in the supplementary regressions. In phase I and II, women tended to record more notes than men. Note quantity was also found to positively predict quantity of idea units included in written summaries. As was seen in the main analyses, participants who rated themselves as having performance approach goal orientations tended to record fewer idea units in their notes than students who did not rate themselves as having a performance approach goal orientation. These patterns are likely attributable to the explanations provided in the main analyses portion of the discussion and will not be readdressed here.

Unexpectedly, there were some differences between the results of the analyses with the state and trait goal orientations. In phase I, performance avoidant trait goal orientation was shown to moderate the relationship between note quantity and quantity of idea units in participants' written summaries. Among individuals who recorded relatively few idea units in their phase I notes, those who rated themselves as having a performance avoidant trait goal orientation included fewer idea units in their phase I written summaries than those who did not rate themselves in this group. However, among individuals who recorded higher numbers of idea units in their phase II notes, those who rated themselves in the performance avoidant group included more idea units in their written summaries than individuals who were not in this group. It is important to note that because so few individuals rated themselves as having performance avoidant goal orientation ($n=7$), these results must be interpreted with caution. However, the observed trend in the data is not surprising in light of the literature, which suggests that

performance goal orientations can differentially impact individuals with high and low ability conceptions. Those with performance goal orientations and low ability conceptions tend to respond to tasks with withdrawal and negative affect, while those with performance goal orientations and high ability conceptions tend to show persistence and increased effort (Elliot et al., 1988).

Although the moderating effect of performance avoidant trait goal orientation seems to fit with the pattern of existing literature, it is important to note that this effect was not observed in the main analysis involving performance avoidant state goal orientation. It is possible that experimental limitations such as small sample size or the fact that participants were asked to rate their trait goal orientation with a single item questionnaire may have clouded the results; however, there is also evidence to suggest that state and trait goal orientations are related but separate constructs that impact behavior differently (Button et al., 1996). Some researchers view goal orientation as a stable trait among individuals, and choose to measure levels of this characteristic within individuals (Ames & Archer, 1987; Duda et al., 1992; VandeWalle et al., 2001). Other researchers have chosen to manipulate goal orientation in their experiments because they viewed goal orientation as a situational response to external factors, which can vary across scenarios (Ames, 1984; Elliot & Dweck, 1988; Steele-Johnson, Beauregard, Hoover, & Schmidt, 2000). Others have integrated both theories, suggesting that “goal orientation is best characterized as a somewhat stable individual difference variable, which may be influenced by situational characteristics (Button et al. 1996).” The results from this dissertation, which show differences between the impact of state and trait performance avoidant goal orientations within the same experiment, adds evidence to the growing pool of information suggesting that state and trait goal orientations may be more distinct than was previously thought. As research continues

to explore the goal orientation construct, particular attention should be paid to how these constructs are related.

Lastly, it was also noted that in phase II, among individuals who recorded relatively few idea units in their phase II notes, individuals with a trait performance approach goal orientation included more idea units in their phase II written summaries than those who did not include themselves in that group. However, among individuals who recorded higher numbers of ideas in their notes, those who rated themselves in the performance approach group included fewer idea units in their written summaries than those who did not rate themselves in this group. Although results from the main analyses found that state performance approach goal orientation also moderated the relationship between note quantity and quantity of idea units in written summaries, the direction of this relationship was observed to be reversed for individuals with performance approach trait goal orientation. This reversal seems to contradict existing literature cited above suggesting that performance approach goal orientation would bring increased effort and may lead to increased performance when participants have high perceptions of their own competence and that behaviors like withdrawal and reduced effort would occur when participants have low perceptions of their own competence. Although the reasons for this unexpected result are unclear, the information is valuable as support for further research on the relationship between state and trait goal orientations.

Educational Implications and Areas for Future Research

The findings described above may have implications for current practices in the field of education. As predicted, the results indicate that goal orientation, feedback, and gender can impact students' notetaking habits and test performance. Teachers, tutors, and other educational

professionals may be able to use this information to tailor their training practices to maximize student learning and performance.

Clearly, the results of this dissertation showed that note quantity positively predicts performance on measures of student knowledge. This is consistent with prior research (Armbruster, 2009; Peverly et al., 2007) and can be seen as further evidence that notetaking is a valuable skill for students to learn as they participate in the traditional academic process. Teachers should continue to help students learn how to take notes in a way that will help them function within the classroom with direct instruction in notetaking technique throughout the educational process (Reddington, 2011). Students with poor notetaking habits may benefit from interventions aimed at improving areas known to impact notetaking skill. For example, a student struggling with notetaking due to a working memory deficit might show improvement in notetaking skill after an intervention such as rehearsal training, which has been shown to improve working memory performance (Bowler 1991; Hulme & MacKenzie 1992).

Gender differences also impacted the results of the present study. As expected, women tended to take more thorough notes than men. This finding was consistent with past research (Peverly et al., 2007; Reddington, 2011), and should be passed on to teachers as evidence that there may be a need for more instruction in notetaking directed at males who struggle in this area. It is important to note; however, that there were no differences found in the main effects for gender on performance variables in either phase I or phase II, suggesting that while males take fewer notes, they may be compensating with other strategies for success on assessments of their knowledge. Teachers should be aware of this gender difference in notetaking habits as they work with male students. Research has suggested that individual transcription speed may underlie the gender differences in notetaking (Reddington et al., 2006). Male students in

particular may benefit from strategies such as receiving handouts from teachers that outline class materials (Kiewra, 1989) or the use of a computer to take notes during class. Future research should continue to investigate the reasons for the gender differences between men and women.

Goal orientation was shown to impact both notetaking and performance. Specifically, participants who were in the performance approach group tended to take fewer notes and outperform their classmates on the test of their knowledge. Further analysis of the data show, however, that this pattern was only observed among men, and that female participants were largely unaffected by goal orientation grouping. These results are not surprising in light of previous research which highlights similar relationships between performance approach goal orientation and increased effort and higher task performance (Elliot et al., 1997; Elliot, et al., 1999, Wolters, 2004). They are interesting however, in the context of the notetaking literature, which had not included goal orientation as a predictor of notetaking in any experimental study prior to the current research. The general trends in the present research suggest that male participants in performance approach conditions seem to work hard to ensure that they will achieve the desired standard, but that they focus on efficiency. When they were familiar with the demands of the task, males seemed to reduce their effort to the minimum necessary to succeed after they were comfortable with their ability to meet the goal. This pattern was evident in the behavior of male participants grouped in the performance approach condition in the present study, who worked hard to include more idea units than other groups in their phase I written summaries, but took far fewer notes than and performed similarly to their classmates in the other goal orientation groups in phase II. To avoid the apparent reduction in effort that occurs when students with performance approach goals have determined what strategies are necessary for them to achieve success, research suggests that teachers should promote learning goals alongside

performance approach goals in their classes (Elliot et al., 1997). Future research should seek to identify the strategy or combination of strategies that work most effectively for students with these profiles.

A related finding suggested that while performance approach goal orientation was related to increased performance among students who had higher skill levels, it was related to lower performance among students who had lower skill levels. This result seems to provide support for the notion that individuals with performance goal orientations and low perceptions of their own ability tend to respond to tasks with withdrawal and negative affect, while those with performance goal orientations and high perceptions of their own ability tend to show persistence and increased effort (Elliott et al., 1988). Although it is clear that in certain situations, individuals can benefit from an emphasis on performance approach goals, educators should keep in mind that students with weaker skills may not respond well to a push towards specific performance goals that they view as out of their reach. Research investigating the impact of the presence of both learning and performance goals simultaneously is also relevant here (Elliot et al., 1997; Merriman, Clariana, & Bernardi, 2010). In situations where individuals with weaker skills are negatively impacted by strong performance goals, efforts to increase their engagement and performance may need to focus on learning goals, more obviously attainable performance goals, or a combination of the two.

It was noted that feedback can also impact notetaking use. Results from the main analyses revealed that the relationship between goal orientation and note quantity is moderated by the performance feedback received by participants. Among those who were in the performance approach group, receiving negative feedback led to higher quantities of notes than receiving positive feedback; however, among those who were in both the learning and

performance avoidant goal orientation groups, the opposite was true. This may be further evidence that individuals in performance approach goal orientation conditions are motivated to reduce a negative discrepancy between performance feedback and the performance standard set, when they feel that they have the skills to achieve that goal (Bandura et al., 1983). Teachers may be able to use performance approach goals as a way to help students cope with negative feedback by offering students specific goals that students believe are within their capabilities, such as asking a student to improve a test grade by 5 percentage points over their previous test. Future research may focus on identifying additional factors that help students respond positively to negative feedback.

Finally, several analyses involving trait goal orientation as measured by student self-ratings suggested that trait goal orientation may be entirely separate from the state goal orientation concept focused on in this dissertation. While many of the same patterns emerged in the supplemental analyses that involved the trait goal orientation variable, such as participants in the performance approach goal orientation group taking fewer notes than participants in the other goal orientation groups, several different trends were observed. For example, in phase I, performance avoidant trait goal orientation moderated the relationship between note quantity and quantity of idea units in written summaries and performance approach goal orientation moderated the corresponding relationship in phase II. These differences between state and trait goal orientation should be seen as evidence that while the constructs are related, they can have separate consequences for behavior and performance. Future research should focus on identifying how these two constructs may work in tandem to impact student study habits and performance.

What seems most clear from the results of this dissertation is that there are complex relationships between goal orientation, notetaking, gender, feedback, and performance, which make it difficult to isolate the broad best practices for teaching. For example, although there are some results suggesting that performance approach goal orientation can positively impact performance or that negative feedback can negatively impact effort, these trends are, at best, only applicable in certain situations (Wigfield et al., 2006).

There are a number of studies examining classroom goal structure that suggest that the goal orientation emphasized in a particular classroom can impact students' engagement, behavior, and academic performance (Hughes, Wu, and West, 2011). For example, Wigfield et al. (2006) suggest that classroom environments that emphasize performance goals such as competitive grading may reduce students' intrinsic motivation. Linnenbrink (2005) evaluated the impact of classroom goal orientation through the use of a quasi-experimental design. Over the course of a 5-week period, Linnenbrink followed students in upper elementary school classrooms where teachers were trained to emphasize mastery, performance approach, or performance avoidant goal orientations. Linnenbrink's results suggested that students in the mastery classroom goal condition showed an adaptive pattern of help-seeking behavior and participants in the performance approach classroom showed an increase in performance over time (Linnenbrink, 2005). These results support the idea that teacher practice can influence classroom goal orientation. The challenge for teachers and administrators will be to understand the number of factors that are involved when students participate in the classroom learning process so that they can support their students appropriately.

The challenge for future research is to expand our knowledge of these relationships, especially as we work towards identifying the dispositional factors that impact individual

differences in notetaking and performance. As we learn more about how these factors work together, the practice of teaching will benefit from a clearer understanding of the important relationships.

Limitations

Although the researcher worked hard to ensure the most effective study possible, there were still several areas for improvement, which should be noted. Specifically, the participant pool for the study was made up of almost entirely Caucasian, female, college freshmen and sophomores. Therefore, the results generated may not be applicable to other groups.

Additionally, the lack of diversity in the participant group made certain analyses, especially those related to gender, difficult to interpret with confidence due to the small sample sizes.

Where the sample sizes were small, this was noted; however, future research should seek to use larger and more diverse samples for the purposes of analysis.

Although there were some modest results for feedback observed, the study was limited by the number of feedback trials that participants received. In the present study, participants in the performance approach group recorded more notes than their counterparts in the other goal orientation groups after receiving negative feedback in one trial. However, in some previous experiments by other researchers, participants have received feedback over multiple trials and there is evidence to suggest that the positive results of negative feedback observed in the performance approach category may deteriorate over multiple trials (Elliott & Dweck, 1988; Podsakoff & Farr, 1989). In a longer experiment it would have been interesting for participants to receive multiple sets of feedback to examine the trends over time.

Finally, although trait goal orientation was included as a variable for examination in supplementary analyses, the tool used for measurement was quite simple and may not have

accurately tapped the depth of the trait goal orientation variable. Jackson (1974), Elliot et al., (1997), and others have used relatively lengthy questionnaires to determine trait achievement motivation. Because state goal orientation was the focus of this dissertation, these questionnaires were not employed as part of the study. However, given the differences that were observed between state and trait goal orientation in the results of this dissertation, it may prove worthwhile to continue to explore trait goal orientation using a more formal measurement tool in future research.

Conclusion

The findings of this dissertation support past research indicating that lecture notetaking is a critical skill for students. The goal of the current study was to examine the relationships between goal orientation and feedback on the notetaking habits and performance of college students. It was the first study known to the researcher to investigate these questions through the use of an experimental manipulation. The results of this study identified several trends in the data that have implications for future practices in education. While female participants tended to take more notes than male participants, and participants who took more notes tended to write more complete summaries, other relationships uncovered were complex and involved a number of factors that differed by situation. Relationships between goal orientation and notetaking habits were moderated by gender and feedback. Relationships between notetaking and performance were moderated by gender and goal orientation. This web of interactions speaks to the complexity of the impact of the variables measured on students' academic performance. Future research should seek to identify more patterns of student behavior so that teachers may understand how to provide the most effective learning environment for students.

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Appendix A

Demographics and Motivation Questionnaire

Place the last 5 digits of your student identification number here: _____

Please answer the following:

Gender: Female Male Transgender Other

Date of Birth: Month Day Year

Is English your first language? Yes No

I belong to the following group:

<input type="checkbox"/> Black/African-American	<input type="checkbox"/> Asian-American/Pacific Islander;
<input type="checkbox"/> Latina/Latino	<input type="checkbox"/> Native American/Alaskan Native;
<input type="checkbox"/> White American	<input type="checkbox"/> Other (specify: _____)

Year in school (circle one): 1 2 3 4 5

What is your major? _____

How many psychology courses have you taken? _____

Check which of the following best describes you:

I usually approach my classes with the goal of learning as much as I can.
 I usually approach my classes with the goal of achieving a high grade.
 I usually approach my classes with the goal of avoiding a low grade.

Check which of the following best describes you:

My note taking skills are stronger when compared to other students in my class.
 My note taking skills are about average when compared to other students in my class.
 My note taking skills are poor when compared to other students in my class.

Check which of the following you most agree with:

I believe that taking notes is very important to academic success.
 I believe that taking notes is somewhat important to academic success.
 I believe that taking notes is not important to academic success.

Appendix B

Goal Priming Directions

Since some of you have different directions than others in the room, I will not read them aloud. Please read the remainder of the directions silently. Hold your questions to the end.

You are now going to watch the videotape of a short lecture about the psychology of problem solving. Use this sheet of paper and the next two pages to take your lecture notes. Remember, the notes you take will be used to study for the exam question. When the lecture is done, take a moment to complete your notes, turn the page and wait for instructions for the next task.

Learning Goal Orientation

As a reminder, this experiment examines typical note taking use in college students. Take it as an opportunity to *learn as much as possible* about the topic of the lecture, but try not to worry about your performance on the assessment following the task.

Just do your best to listen and learn as much as you can.

Performance Approach Goal Orientation

As a reminder, this experiment examines typical note taking use in college students. Your goal today is to *earn a passing grade* from a group of reviewers who will score the essay that you write about this lecture.

Do your best to take as many notes as necessary to achieve a passing grade from the review panel.

Performance Avoidant Goal Orientation

As a reminder, this experiment examines typical note taking use in college students. Your goal today is to *avoid receiving a failing grade* from a group of reviewers who will score the essay that you write about this lecture.

Do your best to take as many notes as necessary to avoid receiving a failing grade from the review panel.

Appendix C

Feedback Letters

Negative Contrived Feedback

Dear Student,

The essay that you wrote in Phase I has been reviewed. Unfortunately, your essay failed to meet the standard set by the reviewers. Your Phase I essay score has been recorded as:

BELOW STANDARD

Thank you for participating in Phase I of this study.

Positive Contrived Feedback

Dear Student,

The essay that you wrote in Phase I has been reviewed. Congratulations, your essay successfully met the standard set by the reviewers. Your Phase I essay score has been recorded as:

ABOVE STANDARD

Thank you for participating in Phase I of this study.

Appendix D

Timetable of Procedure for Participants

Phase I

1. Listen to a brief introduction of the research by the researcher (5 mins)
2. Complete a short demographics and goal orientation questionnaire (5 - 10 mins)
3. Watch and take notes on an 8-minute lecture about the psychology of problem solving (8 mins)
4. Study notes, for 7 minutes, in preparation for answering the exam question (7 mins)
5. Complete a short word search puzzle (3 mins)
6. Answer the exam question (15 mins)
7. Turn in packets to researcher and receive instructions about logistics for phase II (5 mins)

Phase II

1. Listen to a brief introduction of the research by the researcher (5 mins)
2. Review Feedback from Phase I (5 mins)
3. Watch a videotape of a 12-minute lecture about the psychology of problem solving (12 mins)
4. Study notes, for 7 minutes, in preparation for answering the exam question (7 mins)
5. Complete a short word search puzzle (3 mins)
6. Answer the exam question (15 mins)
7. Turn in packets to research assistant and debriefing (15 mins)