

INFLUENCE OF ATTENTIONAL AND MOTIVATIONAL FACTORS ON THE
PERFORMANCE OF A MASTERED MOTOR TASK

By

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A THESIS PRESENTED TO THE GRADUATE SCHOOL
OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE IN EXERCISE AND SPORT SCIENCE

UNIVERSITY OF FLORIDA

2004

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ACKNOWLEDGMENTS

I would like to express my extreme gratitude to my supervising committee chair (Dr. John Todorovich) for all of his guidance, support, and patience. His leadership, enthusiasm, and friendship enabled me to complete my work while gaining the insight and knowledge to become a better writer and researcher. I also thank Dr. Tillman and Dr. Fleming for serving on my committee, and for helping me every step of the way, with incredible patience and support. While not a direct committee member, Dr. Christine Stopka deserves my heartfelt gratitude for her daily encouragement, and for providing constant positivism about my abilities.

I also thank Kim Fournier for always being available to assist and educate me in every area of the data-collection process. Her uplifting spirit and willingness to give up her time is greatly appreciated.

I thank all of the participants and instructors who allowed me to use their students for this study. Additionally, I owe a great thanks to the students and staff at Millhopper Montessori for allowing me to focus so much of my energies on completing this study.

I am especially grateful to my friends and family for their love, patience, and support throughout this process. I thank my brother Josh, for allowing me to keep him up late at nights typing on his computer and for putting up with the long absences from home. I sincerely thank my parents for their love, guidance, and support, and for allowing me to chase my dreams. Finally, my sincere thanks go to my friend, Carrienne Vaughn,

for her daily encouragement, for her willingness to help me out in every way imaginable,
and for providing a constant crutch of endless support.

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Abstract of Thesis Presented to the Graduate School
of the University of Florida in Partial Fulfillment of the
Requirements for the Degree of Master of Science in Exercise and Sport Sciences

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August 2004

Chair: John R. Todorovich

Major Department: Exercise and Sport Sciences

The purpose of this study was to determine the influence of one's achievement goal orientation on one's reported attentional foci during the performance of a mastered motor task. Four hundred undergraduate university students completed the Task and Ego Orientation in Physical Activity Questionnaire. Two of the four orientation combinations were found in the population selected for the study. A total of 26 high task/high ego and 20 high task/low ego students participated in a two-foot balance task consisting of five, 20-second trials. The mean path length of the second, third, and fourth trial was compared for the two orientation groups. A t-test showed no differences in the performances of the two groups; t -obtained = .54 ($\alpha = .05$). Attentional foci of participants during the performance was obtained and analyzed. Statements from the high task/high ego group and high task/low ego group produced 12 and 11 categories, respectively. Three themes emerged for both groups: (1) performance influences, (2) research setting enigmas, and (3) concerns of self. While both groups used in the study

were highly task-oriented, each differed in the level of ego-orientation present. Results of a qualitative analysis indicate minimal differences in the reported attentional foci of the two groups, despite the presence of a high ego-orientation in one group. Thus, the study provides new evidence of one orientation possibly having dominance over the other, when both are present.

CHAPTER 1 INTRODUCTION

Understanding the best practices for motivating students remains a focus of research in the field of education. Nicholls (1984) proposed that students' behaviors are goal-driven, and that their beliefs about self-ability will influence their level of motivation. This is referred to as achievement goal theory. Nicholls (1984) determined that students have either a task- or an ego-orientation that is dependent on their conception of ability. The level of differentiation between effort and ability distinguishes these two orientations. Individuals who are task-involved have an undifferentiated conception that effort will affect performance; self-improvement and task mastery are most valued. Ego-involvement is characterized by a differentiated conception, meaning effort merely represents the level of ability; thus participation is driven by a want to demonstrate competence or to avoid incompetence (Duda & Hall, 2001).

While achievement goal theory (Nicholls, 1984) has been used to influence students' orientations (Todorovich & Curtner-Smith, 2002, 2003), research has not yet identified why the orientation influences how tasks are learned, specifically where attention is directed during performance. Abernethy (2001) said "It is difficult to imagine that there be anything more important to the learning and performance of sport skills than paying attention to the task at hand." (p.53). Multiple studies conducted by Gabriel Wulf and colleagues (McNevin, Shea, & Wulf, 2003; Perkins-Ceccato, Passmore, & Lee 2003; Wulf, Lauterbach, & Toole, 1999; Wulf, McConnel, Gärtner, & Schwarz, 2002; Wulf, McNevin, Fuchs, Ritter, & Toole, 2000; Wulf, McNevin, & Shea, 2001; Wulf, Prinz, &

Hob, 1998; Wulf, Shea, & Park, 2001; Wulf, Weigelt, Poulter, & McNevin, 2003) provided evidence that attentional focus (internal or external) determines how well a task is performed and more importantly, learned. Findings have indicated that an external focus of attention leads to higher performance for both new and mastered tasks (McNevin, Shea, & Wulf, 2003; Wulf, Lauterbach, & Toole, 1999; Wulf, McConnel, Gärtner, & Schwarz, 2002; Wulf, McNevin, Fuchs, Ritter, & Toole, 2000; Wulf, McNevin, & Shea, 2001; Wulf, Prinz, & Hob, 1998; Wulf, G., Shea, C., & Park, 2001). Thus, determining if achievement goal orientation can influence the direction of attentional focus is a logical step to helping teachers better understand how a student's motivation can affect learning and performance.

Purpose of the Study

The purpose of the study is twofold: (1) to determine the influence of one's achievement goal orientation on one's attentional focus during the performance of a mastered task, and (2) to determine the influence of one's achievement goal orientation on the performance of a mastered motor task.

Research Questions

- How does an individual's achievement goal orientation influence one's attentional focus during a mastered task?
- How do attentional foci affect the performance of a mastered motor task?

Hypotheses/Tentative Assertions

- Individuals who are highly ego-oriented and highly task-oriented will describe the use of both internal and external attentional foci.
- Individuals who are highly task-oriented and low ego-oriented will describe their use of more internal attentional foci than external.
- There will be differences among the balance performances of individuals with different task- or ego-oriented combinations.

Definitions

- **Achievement behavior:** “that behavior in which the goal is to develop or demonstrate-to self or others-high ability, or to avoid demonstrating low ability.” (Nicholls, 1984).
- **Attention:** “the taking possession by the mind, in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought; withdrawal from some things in order to deal effectively with others.” (James, 1890).
- **Attentional focus:** breadth and direction of attention; where and how much is being attended to during the performance of a task.
- **Differentiated:** “Effort and ability are inversely related; one’s ability limits the impact that additional effort can provide to enhance probability of task success” (Weiss & Ferrer-Caja, 2002).
- **Ego involvement:** “states where individuals seek to demonstrate ability in the differentiated sense.” (Nicholls, 1984).
- **External focus of attention:** Environmental stimuli including the effects of one’s movement or any external stimuli associated with the movement.
- **Internal focus of attention:** Internal stimuli including cognitions, emotions, thoughts and feelings involved with performance and the process of movement.
- **Motivation:** “those personality factors, social variables, and/or cognitions that come into play when a person undertakes a task at which he or she is evaluated, enters into a competition with others, or attempts to attain some standard of excellence.” (Roberts, 1992).
- **Postural equilibrium:** “the condition in which all the forces acting on the body are balanced such that the COM [center of mass] is controlled relative to the base of support, either in a particular position or during movements.” (Horak, Henry, & Shumway-Cook, 1997).
- **Postural strategy:** “sensorimotor solution to the control of posture, including not only muscle synergies but also movement patterns, joint torques, and contact forces.” (Horak, Henry, & Shumway-Cook, 1997).
- **Task involvement:** “states where individuals seek to demonstrate ability in the less differentiated sense.” (Nicholls, 1984).
- **Undifferentiated:** “Equating ability with effort, or a positive relationship between the two” (Weiss & Ferrer-Caja, 2002).

Limitations

- The absence of additional participants during data collection may affect the participants' influence of ego orientation.
- A laboratory setting may influence the performance of participants.

Assumptions

- The participants will select what they believe to be the best strategy.
- The participants will provide honest answers on the questionnaires selected for the study.

Significance of the Study

Research on the direction of attention during the performance of a skill indicates that an external focus has greater influence on skill retention than an internal focus (McNevin, Shea, & Wulf, 2003; Wulf, Lauterbach, & Toole, 1999; Wulf, McConnel, Gärtner, & Schwarz, 2002; Wulf, McNevin, Fuchs, Ritter, & Toole, 2000; Wulf, McNevin, & Shea, 2001; Wulf, Prinz, & Hob, 1998; Wulf, G., Shea, C., & Park, 2001), yet the reasoning behind attentional selection remains unclear. Experiments have shown that an external focus is preferred when participants are free to choose where they direct attention (Wulf, Shea, & Park, 2001). Research that has been done on motivation indicates that the amount of effort that will be elicited during a task depends on one's achievement goal orientation. Thus, there appears to be a need to determine if a persons' goals for participating in an activity will influence how they direct their attention during the performance of that activity.

While research supports that achievement goal orientations can be influenced by a teacher's manipulation of the motivational climate (Todorovich & Curtner-Smith, 2002, 2003), it remains unknown if the learning of a task is depicted by goal orientations. Understanding where attention is directed during the performance of a task can help

determine what feedback should be given to students who meet their goal orientations, and can help them improve. Furthermore, consistent with the work of Todorovich and Curtner-Smith (2002, 2003) and Ames (1992), knowledge of attentional preference will help teachers present tasks in accordance with the motivational climate they wish to create.

CHAPTER 2 REVIEW OF LITERATURE

The purpose of this literature review is to define and describe achievement goal theory, attentional focus, and how attentional focus affects performance on mastered skills. Attentional focus strategies that have been used for mastered skills are reviewed. For this particular study balance was selected as the mastered skill, and a description of the balance task is provided.

Achievement Goal Theory

Determining how personal interest influences the manner in which one selects to participate in any goal driven environment (e.g., school, professional settings, athletics) is a highly pursued research area. Understanding what motivates individuals to perform is significant for determining how tasks will be presented. Furthermore, knowing which situations will better enhance the chance of continued motivation is an area currently receiving considerable research.

Specific to the field of education, Nicholls (1984) was one of the earliest researchers involved in explaining the Achievement Goal Theory and its connections to student performance. Particularly, Nicholls (1984) states that behavior and thought can be predicted by a student's goals. Nicholls describes student behavior specific to achievement settings as achievement behavior. In turn, achievement behavior is defined as one's goal-driven motivation to demonstrate high ability or avoid demonstrating low ability (Nicholls, 1984). Thus, two distinct conceptions of ability result from a student's perceived level of competence: task-involvement and ego-involvement.

Conceptions of ability are driven by how one perceives the relationship between ability and effort (Nicholls, 1989). An Ego-orientation (Nicholls, 1984) is associated with a differentiated belief that optimum effort only shows the capacity of ability. That is, ability and effort are conceived as two separated constructs, and if one has to put forth more effort than someone else (regardless of final performance levels) then the other person is perceived as more successful. Conversely, task-orientation is associated with an undifferentiated perception of belief and ability. Individuals with a task-orientation believe that competence and ability are improved through increased effort during learning experiences (Nicholls, 1984).

Task Orientation

Students who are task-oriented perceive success as demonstrating self-improvement through maximizing individual effort (Walling & Duda, 1995), and task-oriented students elect to participate in activities with the purpose of gaining competence and knowledge. Moreover, task-oriented students put forth more effort when faced with tasks they perceive as challenging (Dai, 2000). This undifferentiated view of effort and ability drives individuals to increase effort because of the apparent improvement it may have on their ability (e.g., increasing one's effort attains improvement) (Duda, 1992). Referred to as mastery oriented by Ames (1992), effort is required to achieve personal bests, demonstrate task mastery, and receive personal satisfaction. Ames (1992) also suggests that a mastery (task) orientation would lead to higher levels of motivation due to it being of the intrinsic (internal) variety while ego-orientations would involve extrinsic (external) goals.

Ego Orientation

Individuals demonstrating an ego orientation define success as being dependent on norm-referenced ability levels, perceive achievement as demonstrating higher levels of ability than others (Walling & Duda, 1995), and have a differentiated belief of effort and ability. These individuals perceive that they have certain ability potential, which cannot be exceeded through increased effort. Higher displays of effort only demonstrate one's true ability level, and therefore, effort might be minimized if it is believed that one's ability is poor (Nicholls, 1984). Ego-oriented individuals choose to participate in tasks with which they were successful and/or in activities in which their perception of competence is high (Duda & Hall, 2001). Ego-orientation individuals may also elect not to participate in a test in order to avoid failure. Atkinson and Raynor (1978) state, "whenever performance is evaluated in relation to some standard of excellence, what constitutes the challenge to achieve for one individual poses the threat of failure for another." (p. 14). Nicholls (1989) and Covington (1992) termed these approach and avoidance behaviors as ego superiority and ego protection, respectively. Therefore, ego-oriented individuals can potentially demonstrate different behaviors in similar settings despite having similar orientations.

For any given task, individuals having an ego-orientation may elicit either avoidance or interest in activity depending on any number of factors (e.g., perceived competence, ability of opponents, and effort necessary to demonstrate performance or avoid low performance). Jagacinski and Nicholls (1987) found that knowledge of the effort other participants had given in the same task had an influence on perceived competence. In a study using both task- and ego-involving conditions, students were given information regarding the amount of effort other individuals had demonstrated for

the same task. Two feedback statements were given, 1.) Performances similar to their own had required more effort than they had demonstrated or 2.) Performances similar to their own had required less effort. In the ego-involving conditions students reported feeling less competent when they received feedback that others had given less effort for the same performance. However, in the same conditions this group reported increased feelings of accomplishment when provided feedback that others demonstrated more effort (Jagacinski & Nicholls, 1987). Thus, competency in ego-oriented individuals is highly dependent on the performance of others and most importantly, how much effort they elicit.

Determining Achievement Goal Orientation

In order to determine an individual's achievement goal orientation Duda and Nicholls (1992) developed the Task and Ego Orientation in Sport Questionnaire (TEOSQ). Included on the questionnaire were items reflecting both task- and ego-oriented criteria. The original TEOSQ consisted of 13 items, seven items describing more task orientation behaviors and six items describing ego oriented behaviors (Duda, 1992).

Walling and Duda (1995) developed a TEOSQ with additional questions that were more specific to a physical education environment. The 16-item TEOSQ included eight questions for both task- and ego orientations. Additionally, perception of success was changed to be more specific to a physical education setting (with the addition of the stem of "I feel really successful in physical education when...") (Walling & Duda, 1995, p 146). Students were asked to rank feelings of success for each item on the TEOSQ on a 5-point scale, 1 (one) indicating strong disagreement and 5 (five) indicating strong agreement (Walling & Duda, 1995). A median split was used to divide the subjects into

four orientation groups: high task/high ego, high task/low ego, low task/high ego, and low task/low ego.

Motivational Climate

Epstein (1988) developed the acronym TARGET to group teaching principles and strategies into six areas of the learning environment: task, authority, recognition, grouping, evaluation, and time. Curtner-Smith and Todorovich (2000) state, “The choices instructors make regarding these elements affect the extent to which the motivational climate of a lesson or sports practice is more ego- or task-involving” (p. 124).

TARGET has since been used to help design physical education settings (Todorovich & Curtner-Smith, 2002, 2003), which will influence students’ goal orientations. In two studies using third and sixth grade students, the motivational climates that were created by teachers influenced students’ goal orientations. In both studies Walling and Duda’s (1995) TEOSQ was used to determine students’ goal orientations. Ten modified field hockey lessons were taught in both studies using either a high ego-involving climate or a high-task involving climate. A 10-lesson softball unit was taught and used as a control. After the completion of the unit, participants were again asked to fill out a TEOSQ to determine their post-lesson goal orientations. Significant evidence was found supporting that motivational climate had an influence on students’ goal orientations. However, the authors noted that strong orientations (high-task or ego) were not weakened by the influence of the motivational climate (Todorovich & Curtner-Smith, 2003).

The results of the previous studies have not indicated whether a task- or ego-involving climate is more beneficial to skill development but instead suggest that a teacher or coach may manipulate their classroom towards their desired climate

(Todorovich & Curtner-Smith, 2003). Additionally, Curtner-Smith and Todorovich (2002) have developed a systematic observation instrument known as the Physical Education Climate Assessment Instrument (PECAI) to help teachers and coaches determine the motivational climate of their classroom as well as to determine which activities will better suit each goal orientation. The PECAI is a valid and reliable instrument for determining motivational climate that will aid researchers and teachers in creating climates that best enhance the opportunity for skill development (Curtner-Smith & Todorovich, 2002).

Attention

Dating back to studies done by William James (1890), attention has long been explained as having limitations as well as selectiveness. Limitations consist of our abilities to take on many tasks at once. These limitations have been studied most frequently with divided attention and closely related research on dual-task paradigms (Abernethy, 1993). Performance on a task is affected by attentional allocation to a second task; thus, when two tasks are attended to at once then performance in both may suffer (Abernethy, 1993, 2001). While attentional capacity remains stable the resource demands of the first task will depict the residual capacity that can be allocated for a second task. In fairly simple or learned tasks more attentional resources can be given to a second task. However, when the attentional demands of the first task increase, performance on the second task will decline (Abernethy, 1993). Therefore, attention is determined to have a limited capacity allowing us to only attend to a few tasks at any given time (Abernethy, 1993). Due to these limitations attention is comprised of focusing on some cues while attempting to ignore others (James, 1890). This definition most clearly describes selectivity.

Selectivity

In addition to our experiences and knowledge, we voluntarily and involuntarily select to what we will attend (Mathews, Davies, Westerman, & Stammers, 2000). There are an enumerable amount of cues that we attend to, some being of a greater importance than others. The familiarity with a task will increase our ability to attend to the cues that are most relevant and ignoring those that are less pertinent to the performance of the task cues (Abernethy, 1993, 2001). Seemingly, where we focus our attention becomes of the utmost importance to increase task performance. Once we begin to master or improve on a task then we are able to focus on additional pertinent cues that would have once been distracters due to our limited capacity. Thus, it is deemed that skills become automatic allowing for the available resource pool to focus more on additional cues (Abernethy, 1993, 2001). It is apparent then that our abilities and/or experiences in a task will influence where we focus our attention.

Attentional Focus

Nideffer (1976) describes attention as having either a very broad or a narrow focus. A narrow focus is characterized by filtering out a great deal of information and attending to particular aspects of the task or situation. A broad focus consists of attending to more cues within the task. Additionally, broad and narrow foci are conducted both internally (thoughts, feelings) and externally (environmental conditions) (Nideffer, 1976). Thus direction and depth creates four combinations of dimensions: broad external attentional focus, broad internal attentional focus, narrow external attentional focus, and narrow internal attentional focus (Nideffer, 1976). Most individuals will balance attention across differing widths and directions (Nideffer, 1976).

“At any single moment, attention can be described on the basis of both its width and direction” (Nideffer, 1976 p. 395). Within each situation, individuals may have a broader focus if the task demands them to attend to a wide array of cues. Nideffer (1976) suggests that we can apply attentional dimensions to specific “environmental situations” (p. 396). Therefore it becomes necessary to be able to match attentional abilities to the demands of the environment, or task, in order to be successful.

Within Sport Settings

Skill development related to sports and activities is greatly dependent on one’s ability to attend to important cues; however, where the task is being performed, and by whom, will have a large impact on what cues are important. When skills are performed in isolation, [e.g. a closed skill environment) (Rink, 2002)] many variables, such as an opponent, are removed from attentional demands thus causing for an adjustment of attention, (e.g., a more narrow focus) (Nideffer, 1976). In an open, ever-changing environment, such as a game situation, a broader focus would be used. Additionally, the experience of a participant will affect breadth, as well as where attention is directed (Singer, Lidor, & Cauraugh, 1993). When individuals are more experienced they can attend to more cues than an individual with less experience. This will influence where attention is directed, causing focus to occur either internally or externally. For the purposes of this study the directional focus (Nideffer, 1976), internal and external, will be discussed in further detail.

Internal

Internal stimuli include cognitions, emotions, thoughts and feelings involved with performance (Nideffer, 1976). This includes the thoughts regarding the process the body goes through to conduct performance, (e.g., throwing, kicking, striking), and focusing on

various points or cues (Rink, 2002) within the performance movement (e.g., stepping with an opposite foot when throwing). Nideffer (1976) further characterizes having an internal focus as tuning out environmental factors. Thus, thoughts about an external object, (e.g., onlookers such as an audience), would be viewed as an external focus despite being internal thoughts. This is due to attention being drawn to an external distraction.

External

Environmental stimuli including the effects of one's movement or any external stimuli associated with the movement are characterized as external foci (Nideffer, 1976; Abernethy 1993, 2001), or sensory set (Masters, Polman, & Hammond, 1993). An external focus involves environmental demands (Nideffer, 1976), which in sport settings would include an oncoming object, (e.g., watching the ball make contact with the bat) or any product of movement (e.g., the trajectory of the ball off the bat or racket, aiming at a target).

There are also conditions that exist in which self-awareness, normally associated with internal thoughts and feelings, is considered an external focus. Situations involving a mirror or an audience have a higher tendency to increase self-attention (Carver & Scheier, 1978). Similarly, Duval and Wicklund found that use of a video camera would also increase self-awareness (as cited in Carver & Scheier, 1978). Nideffer (1976) states that this self-awareness is an ego-involving condition that may cause a decrease in interest for task mastery. As stated earlier it is important to note that most individuals maintain a balance between internal and external attentional focus (Nideffer, 1976), however, there are situations in which one may be more beneficial than the other.

Directing Attention When Performing a Task

There have been multiple studies conducted with the intentions of determining where and what individuals should attend to when performing tasks. As supported by Singer, Lidor, and Cauraugh (1993)

When beginners are traditionally instructed, they are told to pay attention to what they are doing, and to think about the act during execution. They are guided to be aware of movement cues and what the body parts are doing during the act. (p. 19)

The stages of motor learning would also suggest that it is necessary for the learner to initially focus on how the movement is performed. Fitts and Posner (as cited in Rink, 2002) describe three stages that individuals go through to produce skilled movement. The first stage of motor learning, known as the cognitive phase, is followed by an associative (timing of a skill), and automatic phase. The automatic phase has traditionally been the point at which athletes become more experienced and are instructed to transfer their focus to an external one. Expertise is often associated with becoming automatic and effortless (Masters, 1992) thus allowing for more to be attended to, both in breadth and direction.

Evidence in sporting activities and appropriate development in physical education suggest that an internal focus may be detrimental to performance. Griffin, Mitchell, and Oslin (1997) support that tasks are typically presented using internal cues before students have an understanding of why correct performance is necessary. Skill development may suffer as a result of the failed connections. Thus, having students consciously use an internal focus can lead to decreased performance due to the disruption of automatic control processes (Wulf, McNevin, & Shea, 2001). This phenomenon has been also described as “paralysis by analysis” (Ehrlenspiel, 2001). Furthermore, Masters (1992) suggests the following:

Failure of expert motor skill is common in cases where performers are highly motivated to succeed. One cause of this can be an inward focus of attention in which an attempt is made to perform the skill by consciously processing explicit knowledge of how it works. The resulting disruption of the automaticity of the skill leads to its failure. (p. 343)

As a result, studies would indicate that directing attention externally for a mastered task would elicit the best performance. Due to the success achieved from an external focus, research was conducted on the inclusion of an external focus on new tasks. The results of external attentional focus studies are provided below for both new and learned tasks.

New tasks

When learning a new task research has indicated that students demonstrate greater retention when they attend to the effects of movement (external stimulus) rather than an internal stimulus (the movements themselves) (Wulf, Lauterbach, & Toole, 1999; Perkins-Ceccato, Passmore, & Lee, 2003). In a study conducted by Wulf, Lauterbach, and Toole (1999) participants with no golfing experience were given the task of performing a swing, which were specifically pitch shots. Two groups, an internal and external focus group, were given the same instructions on stance and swing. The external stimuli group was instructed to focus on the pendulum swing of the golf club while the internal stimuli participants were asked to concentrate on the form of the golf swing. The results indicated that the external focus group demonstrated high performance levels earlier than the internal focus group. This group also remained more consistent throughout the study and on retention tests than the internal focus groups (Wulf, Lauterbach, & Toole, 1999). Despite these findings, it is suggested by the authors that the initial demonstration should be taken into consideration as having an influence on learning of the skill (Wulf, Lauterbach, & Toole, 1999).

Perkins-Ceccato, Passmore, and Lee (2003) conducted a study similar to the golfing experiments done by Wulf, Lauterbach and Toole (1999) but included experienced golfers in the study in addition to the inexperienced golfers. The same internal and external strategies were used as well as the same teaching cues. Findings were consistent with Wulf, Lauterbach, and Toole (1999) such that experienced golfers also demonstrated higher performance when choosing an external focus.

Studies have also been performed in which participants were allowed to self-direct their attentional focus. Wulf, Shea, and Park (2001) conducted two studies allowing participants to change their attentional focus from trial to trial during a balance task, performed on a stabilometer. In the first study, participants were allowed to switch their focus on the first day and then asked to use a preferred attentional focus on the second day. During retention tests participants were not given instructions regarding attentional focus but were later asked to identify where they had directed their attention. In experiment 2, participants were allowed to change their attentional focus during both trial days and then asked to choose a preferred focus during retention tests. Both experiments indicated that when given the opportunity to make selections about a preferred direction of attentional focus most participants selected an external focus on retention tests. Most importantly, participants selecting an external focus demonstrated higher levels of performance on the balance task (Wulf, Shea, & Park, 2001).

This study would further support the findings of Wulf, McNevin, and Shea (2001) that the selection of an external focus will prevent disruption of the automaticity of the movement allowing the conscious to attend to additional cues. Wulf, Shea, and Park (2001) further support “[that] focusing on the remote effects of the movement might let

more natural control processes take over, ‘freeing up’ conscious attention to be directed to other aspects of the task, resulting in more effective performance and learning.” (p. 342).

In order to determine if attentional resources are made available when using an external focus over an internal focus follow up studies were conducted. Using a stabilometer and remaining consistent with previous studies (Wulf, Shea, & Park, 2001), Wulf, McNevin, and Shea (2001) had participants with no previous experience on a stabilometer perform a balance task. Participants were asked to direct their attention internally or externally while reacting to an auditory stimulus that monitored reaction time (RT). The inclusion of the RTs was necessary to provide data to support the prediction of Wulf, McNevin, and Shea (2001) that using an external focus would reduce attentional demands thus leading to faster RTs than an internal focus. While performance and RT improvements were seen for both focus strategies the participants using an external focus demonstrated better balance performance and RTs than the internal focus group (Wulf, McNevin, & Shea, 2001). These results indicate that an external focus does require fewer attentional demands than an internal focus.

Despite current evidence of an external focus leading to higher performances, assumptions cannot be made that any external focus will be beneficial to task development. Wulf, McNevin, Fuchs, Ritter, and Tool (2000) have found evidence to support that focusing on the effects of movement is more effective for learning than focusing on a target alone, suggesting that technique does play a significant role.

Two different studies were conducted to determine the effects of an external focus that was removed from movement (e.g., a target not in contact with an individuals’

movement). In the first study, participants with no tennis experience were asked to return balls from a ball machine using a forehand stroke. Both groups were given the same instructions on technique. The participants were separated into two groups. The first group was instructed to focus on the trajectory of the ball coming toward them while the second was asked to focus on the ball leaving the racket. Results during retention tests indicated that focusing on the effects of movement (second group) led to higher proficiency than directing attention to the ball alone. Both external stimuli involved focusing on the ball but by focusing on the effect of movement on the ball participants had greater success (Wulf et al., 2000).

In their second experiment, similar to the golf study used by Wulf, Lauterbach, and Toole (1999), inexperienced participants were grouped and asked to focus on two external stimuli. The first group was asked to focus on the club head while the second group focused on hitting a target. Again, results indicated higher performance, retention, and learning of the skill for those groups using a stimuli related to technique (Wulf, McNevin, Fuchs, Ritter, & Tool, 2000). These two experiments would indicate that an external stimulus closer in proximity to the body might lead to higher results.

McNevin, Shea, and Wulf (2003) continued work on proximity by using balance tasks using a stabilometer but changed the distance of external focus markers from what had been used in previous studies (Wulf, Shea, & Park, 2001; Wulf, McNevin, & Shea, 2001). Participants were asked to focus internally or on one of three focal markers placed at different distances from their feet, either directly in front (near), inside, or outside. Results specific to internal and external focus were consistent with previous studies. External focus groups demonstrated higher levels of performance than internal focus

groups. Additionally, the performances of inside and outside external focus groups were more effective than the near group (McNevin, Shea, & Wulf, 2003). This decrease in performance in the near group may be due to attention directed too close in proximity once again causing a disruption on automatic control processes.

Learned tasks

While there is significant evidence to support that an external focus of attention is beneficial when learning a new skill (Wulf, Lauterbach, & Toole, 1999; Wulf, McNevin, Fuchs, Ritter, & Tool, 2000) focus of attention for learned skills may differ. Using a format similar to their study with inexperienced golfers, Perkins-Ceccato, Passmore, and Lee (2003) used the same attentional strategies with a group of experienced golfers. However, the external stimuli in this study was to focus on hitting the ball as close to the target as possible while the internal cue was to concentrate on the form of the swing and to adjust the force of the swing to the distance of the shot (Perkins-Ceccato, Passmore, & Lee, 2003). The results indicated that participants with no golf experience had higher success receiving an internal stimulus first than those who received an external focus first, whereas the experienced golfers performed higher when using an external focus over the internal focus (Perkins-Ceccato, Passmore, & Lee, 2003). The findings of experienced golfers increased performance when using an external stimulus are similar to Wulf, McNevin, and Shea (2001) who found that providing an internal focus might actually interfere with automatic control processes thus inhibiting performance.

Attentional Focus Feedback

Wulf, McConnel, Gärtner, and Schwarz (2002) conducted studies on attentional focus when feedback was provided to reinforce attentional cues. Experiments were done to determine what effect attentional feedback and the frequency of such feedback had on

performance. In experiment 1, groups of inexperienced and experienced volleyball players practiced serves while receiving either internal-focus or external-focus feedback. While movement quality was not affected by feedback, external-focus feedback did lead to higher accuracy of serves than the internal-focus feedback.

While the significance of the presence of feedback is not completely known Wulf, McConnel, Gärtner, and Schwarz (2002) conducted a second experiment that attempted to determine if the frequency of feedback on attentional focus affected a soccer shooting skill performance. Participants with soccer experience were given either internal-focus or external-focus feedback with the frequency of feedback for both groups occurring either on every trial (100% of the time) or every third trial (33% of the time). Results indicated that external-focus feedback resulted in higher performance than internal-focus feedback, regardless of frequency. Furthermore, in both conditions using internal-focus feedback, the lower frequency of feedback (33%) resulted in higher performance than higher frequency feedback (100%). These results would indicate that an internal focus has a negative effect on performance and lower amounts of internal feedback would result in an alleviation of negative effects (Wulf, McConnel, Gärtner, & Schwarz, 2002).

Balance

“Balance has been viewed as a skill that the nervous system learns to accomplish using many systems, including passive biomechanical elements, all available sensory systems and muscles, and many different parts of the brain” (Horak, Henry, Shumway-Cook, 1997, p. 517).

More therapists are viewing balance as a motor skill that we learn and therefore can improve just like any other motor skill through practice, feedback, and experience (Horak, Henry, & Shumway-Cook, 1997). Motor skills can be broken down into specific

cues that help direct attention. Balance can then be evaluated to determine where improvements can be made according to the recorded postural sway.

Postural Sway

“Maintaining body equilibrium, which is thought by most to be an effortless task, is actually a complex process involving the coordinated activities of multiple sensory, motor and biomechanical components” (Palmieri, Ingersoll, Stone, & Krause, 2002, p. 51). Balance or specifically an upright stance requires the use of a postural control, controlling the body’s position in space, system to remain stable (Palmieri, Ingersoll, Stone, & Krause, 2002). Force platforms are used to quantitatively measure postural control. Palmieri, Ingersoll, Stone, and Krause (2002) state that force platforms assess changes in postural sway, (i.e., changes in center of gravity) by recording the ground reaction forces projected from the body. Center of pressure (COP) is calculated from these projected forces (Palmieri, Ingersoll, Stone, & Krause, 2002).

Marsh and Geel (2000) have used force platforms during balance tasks to determine the displacement of the COP. In studies involving various balance conditions, some including the use of a foam pad, measurements were recorded in reference to the COP, medio-lateral (ML) standard deviations of the COP, anterior-posterior (AP) standard deviation of the COP, COP path length, also described as a spaghetti diagram (Winter, Patla, Ishac, & Gage, 2003), average sway velocity of COP, and the path of the COP (Marsh & Geel, 2000). The spaghetti diagram is a summation of the anterior/posterior COP and medial/lateral COP (Winter, Patla, Ishac, & Gage, 2003). The path length is determined by the measurement of the entire length of the spaghetti diagram.

CHAPTER 3 METHOD

Subjects

Four hundred undergraduate university students attending classes at one large university located in the southeastern United States were recruited to participate in this study. The participants were selected based on their scores on a version of the Task and Ego Orientation in Sport Questionnaire (TEOSQ; Duda, 1989; Duda & Nicholls, 1992) known as the Task and Ego Orientation in Physical Activity Questionnaire (TEOPAQ; Todorovich & Wirth, 2003). The TEOPAQ produces scores that reflect both one's task- and ego-orientations. This allows students to be grouped as high in both, high in one and low in another, or low in both. Students were given the TEOPAQ during their regularly scheduled class meetings, and they were asked to report occasions when they felt most successful in physical activity by responding to each question on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Consistent with previous studies (Walling & Duda, 1995), a median split was used to categorize the participants in one of two orientation groups: (a) high task/high ego, and (b) high task/low ego. For each question on the TEOPAQ, scores of four or higher were considered highly task or ego orientated and scores three and below were given a low task or ego orientation.

From an original pool of 400 students, forty-six students demonstrating an appropriate representation of both task and ego extremes were used in the study. Thus, extreme high task-orientations and extreme high ego-orientations as well as extreme low ego-orientations were selected first. The orientations used in the study were in the high

task/high ego and high task/low ego groups as these were the only groups that emerged from the participant population. The high task/high ego orientation group included 26 students (M age = 20.69 years, SD = 1.40, females = 10, males = 16) while the high task/low ego orientation group included 20 students (M age = 21.4 years, SD = 3.56, females = 14, males = 6).

After TEOPAQ scores were analyzed, participants who had been selected by the investigator to complete the study were contacted via telephone and e-mail. This contact was made by the investigator and was done for notification purposes only. These participants were then given information regarding the time and date of their participation in the study if they agreed to participate.

Instruments

Laboratory

Data were collected in the biomechanics lab at the University. Figure 1 shows a diagram of the laboratory. Located in the center of the lab was a Bertec force platform, model 6040-10 Bertec Cooperation, Columbus, OH. The force platform measured 40 x 60 cm and was built within an elevated box that is flush with the platform. Located on top of the force platform was an AIREX ®Balance Pad measuring 49.5 x 40.6 x 6.4 cm, made of foam. AIREX ®Balance pads “combine exercise and balance skills to increase strength, stamina, differentiation, and coordination” (Allegro Medical, 2003). The foam, which is made from a waterproof substance, creates a wobble effect, which is designed to affect stability.

Directly in front of the platform next to the wall opposite the main entrance was a full-length mirror. To the right of the mirror but still located in front of the platforms was a standard VHS camera. While the participants were not given instructions regarding

their significance, the mirror and camera served as a potential source of feedback for the participants and it had the potential to be reported as a focal point (Carver & Scheier, 1978). The mirror was placed vertically to allow for a reflection of the majority of the participant.

On the far right of the laboratory was a computer station that recorded balance performance on the force platform as a research assistant monitored the computer receiving data from the force platform. Prior to each trial, the research assistant would inform the participant when to get on the force platform. The assistant would then start the balance recording on the Peak Modus and after 20 seconds would direct the participant when to get off the force platform.

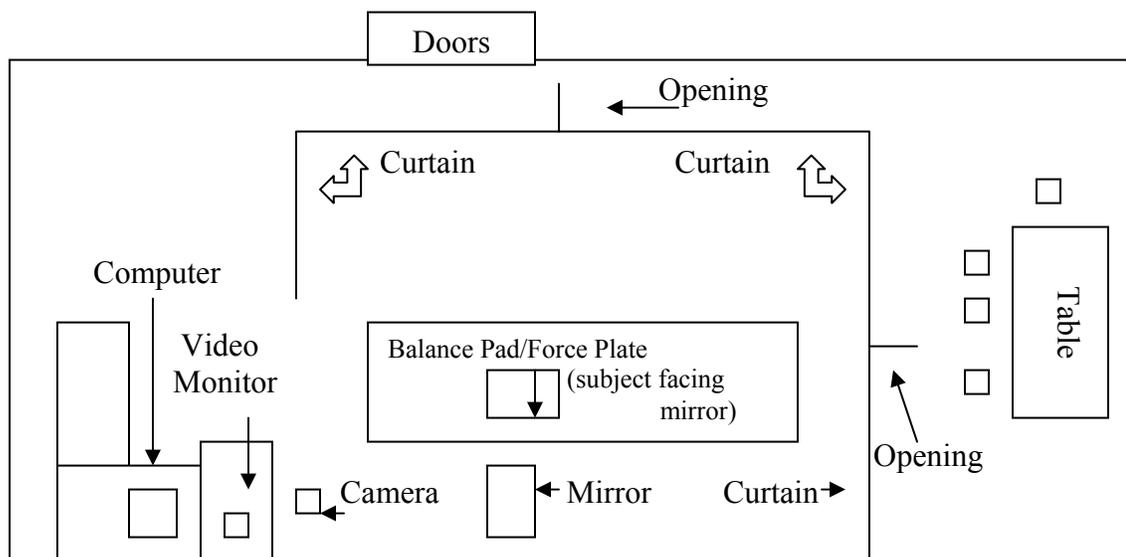


Figure 1. Biomechanics Laboratory

Balance

A Bertec force platform was used to measure the path length (spaghetti diagram) of the center of pressure (COP). The path length is the summation of the anterior/posterior COP and medial/lateral COP (Winter, Patla, Ishac, & Gage, 2003). Bertec force platforms are specifically designed for gait, stability, sports, and other statistic analysis

(Bertec, 1999). Peak Motus 2000 (Peak Performance Technologies, 2004) was used to record a 20 second performance over five trials.

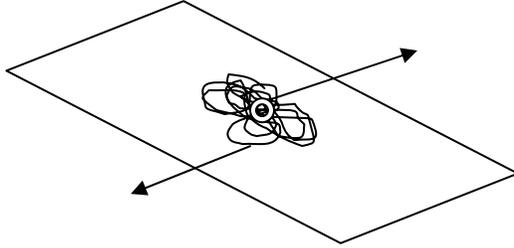


Figure 2. Spaghetti Diagram

Attentional Foci

A self-focus questionnaire was used to determine attentional foci used by participants during the study (Appendix B). The questionnaire included one question regarding what participants were thinking about during the performance of the task. Underneath the question, six numbered spaces were included for participants to list multiple thoughts that may have occurred during the balance task. The participants were instructed by the researcher to write down what they were thinking about during the five balance trials.

Task and Ego Orientation in Physical Activity Questionnaire

The Task and Ego Orientation in Physical Activity Questionnaire (TEOPAQ) (Todorovich & Wirth, 2003) instrument was used to assess the task- and ego-orientations of the participants. The TEOPAQ instrument was inspired by Walling and Duda's (1995) Task and Ego Orientation in Sport Questionnaire instrument was modified for physical education, and it was designed to assess the task- and ego-orientations of participants in physical activity settings. The TEOPAQ was tested for reliability and validity as described in the results (Chapter 4).

The TEOPAQ instrument yields a score for one's task-orientation and a score for one's ego-orientation. The two scores include the mean score of the participants' Likert-type responses to a series of questions for either a task- or ego-orientation. The stem of the questions for the TEOPAQ instrument is "In physical activity settings I feel most successful when..." which is followed by a statement that represents either a task- or ego-oriented response.

Procedures

Instructors who had volunteered their students as potential participants in the experiment were given informed consent forms to hand out to their students. Students in these courses who had given consent were asked to complete the TEOPAQ. Each TEOPAQ was then coded and participants selected for the study were contacted via email and telephone to determine if they wished to complete the remainder of the study. Those that were interested signed up for a 30-minute time slot to attend.

At the appointed time, participants were asked to meet in the biomechanics lab to complete a specific set of steps. First, participants were directed to a table to complete informed consent forms. Once the consent forms had been completed, participants were asked to become barefoot and assume a comfortable stance with their hands on their hips for 20 seconds on the balance pad that was on the force platform. No additional instructions on balance positioning or form were provided to prevent the researcher from influencing the natural balance positioning of the subject. Participants completed five performance trials in this manner. The researcher provided 20 seconds of rest time between each trial. After all trials had been completed participants were directed back to the recording table to complete a self-focus questionnaire. Upon completion of the self-focus questionnaire the data collection process for this study was complete. While the

task performance was conducted, only the participant, researcher, and research assistant were present inside the lab.

Data Reduction

The TEOPAQ Instrument

A principle components factor analysis with a Varimax rotation with Kaiser normalization was used to determine if the questionnaire produced two factors that represented task or ego orientations.

Task- and Ego-Orientation Combinations

The results of the two mean scores from the TEOPAQ instruments can be used to group individuals. In the present study individuals were grouped according to their task- and ego-orientation scores. Participants ranked feeling of success in physical activity for each item on the TEOPAQ on a 5-point scale, 1 (one) indicating strong disagreement and 5 (five) indicating strong agreement. Using a median split TEOPAQ scores were then placed into one of four categories: (a) high task/high ego, (b) high task/low ego, (c) low task/high ego, and (d) low task/low ego. Scores will were ranked according to their level of extremity to determine the following: extreme high task-orientations, extreme high ego-orientations, extreme low task- and extreme low ego-orientations.

Balance

The center of pressure (COP) was measured using a Bertec force platform. Data were sampled at 40 Hz. Raw force plate signals were amplified by a factor of five. Although there were different sources of information that could be elicited from the force platform, for the present study, the path length (spaghetti diagram) of the balance performance over twenty seconds was used. The path length was the recorded movement of the COP. The “spaghetti” like pattern that is produced is measured to determine path

length, in meters. Thus, a shorter path length would indicate less movement of the COP (i.e., better balance). QuickBasic (Basmak, 1991) was used to determine the mean path length of the center of pressure (COP) for each participant's second, third, and fourth trials. A two-tailed t-test comparing the average path lengths of each group was completed using Microsoft Excel.

Attentional Foci

Two researchers involved in the study qualitatively assessed the statements from the self-focus questionnaire following the procedures previously done by LeCompte and Schensul (as cited in McCaughtry, 2004). The researchers categorized each comment according to the emerging themes of internal and external directional focus by reading each statement given by the participants carefully and then placing each statement in emerging categories. The categories produced by both data reviewers were compared for accuracy. A discussion of the categories ensued until agreement was reached between both reviewers.

Data were collected through the use of a self-focus questionnaire. When analyzing the data for each group of participants several categories were revealed that had common patterns. Within each category additional subcategories were developed for each given group. Data were then categorized into themes that represented common categories of the focus statements provided by participants. The common focus statements related themes represented the attentional foci used by participants.

Balance Performance and Goal Orientation Combinations

In order to examine the differences between the balance performances of individuals within both groups an independent t-test ($\alpha = .05$) was used. The mean of the second, third, and fourth trials were determined using QuickBasic software (Basmak,

1991). Data analysis involving the t-test procedure was completed using a Microsoft Excel 2000.

CHAPTER 4 RESULTS

This study examined the influence of achievement goal orientation on the attentional foci of participants during a mastered motor task. To determine participants' achievement goal orientations, the Task and Ego Orientation in Physical Activity Questionnaire (TEOPAQ) (TEOPAQ; Todorovich & Wirth, 2003) was used. The TEOPAQ determined the participants' combination of task- and ego-orientations. When coded, the TEOPAQ placed participants in one of four groups, high task/high ego, high task/low ego, low task/low ego, and low task/high ego. Due to the population used for the study only two groups emerged from the data, high task/high ego and high task/low ego. The remaining two groups, low task/high ego and low task/low ego, were too small in number to determine significance. Thus, only two orientations were used for the study. However, because of the differences in ego orientation for the two groups, high in one group and low in the other, the influence of achievement goal orientation on attentional focus could still be assessed.

A self-focus questionnaire was used to determine the attentional focus of the two groups of participants. The statements provided by the participants were coded using qualitative measures (Patton, 1990) to determine common themes among each orientation group.

The TEOPAQ Questionnaire

The Task and Ego Orientation in Physical Activity Questionnaire (TEOPAQ) was subject to a principle components factor analysis with a Varimax rotation with Kaiser

normalization to determine if the questionnaire, did indeed, produce two factors that represented task or ego orientations. A principal components factor analysis was used rather than a confirmatory factor analysis since this instrument, while inspired by previous instruments, consisted of questions that were worded specifically for individuals participating in physical activity as opposed to a specific sport or physical education course.

The initial results of the factor analysis revealed that two factors were retained with an Eigenvalue greater than 1.0 (5.305 and 3.787, respectively). These two factors were strong in that they accounted for a combined 56.823% of the total variance. Further analysis of the rotated component matrix (Table 1) revealed that there was no need to remove any questions from the TEOPAQ instrument as each question was easily and appropriately classified as either a task-oriented or ego-oriented question.

Table 1. Rotated Component Matrix with Varimax and Kaiser Normalization

Variable	Component	
	1	2
1	.671	4.952E-02
2	-2.552E-02	.671
3	.778	-1.850E-02
4	.792	1.936E-02
5	.338	.789
6	.785	-3.244E-02
7	-4.857E-02	.771
8	-3.914E-02	.780
9	.732	.197
10	-2.104E-02	.754
11	.821	6.571E-02
12	.244	.789
13	-6.601E-02	.760
14	.817	4.668E-02
15	6.602E-02	.859
16	.683	.107

Balance Performance

From an initial pool of four hundred participants, forty-six undergraduate university students were selected to participate in this study (M age = 21 years, SD = 2.56). Initially, participants were grouped into one of two achievement goal orientations, high task/high ego ($n=26$, M age = 20.69 years, SD = 1.40) and high task/low ego ($n=20$, M age = 21.4, SD = 3.56). Participants from both orientations were asked to perform a two-foot, eyes open balance task on a foam pad placed on a force plate for five, twenty-second trials. The results from the t-test comparing the average path length of the second, third, and fourth trials of participants in the high task/high ego group and high task/low ego group were not significant, t -obtained = .54 (α = .05). (Table 2).

Table 2. Orientation Path Length

Participant	Orientation Path Length (in meters)	
	High Task/High Ego	High Task/Low Ego
1	0.8797	1.0497
2	0.8701	0.9403
3	0.9986	0.8913
4	0.8329	0.8603
5	0.8485	1.1934
6	0.9278	0.9176
7	0.8938	0.9581
8	0.9253	0.9296
9	0.9763	0.9422
10	0.848	0.9391
11	0.756	1.001
12	0.9907	1.0627
13	0.8784	1.01
14	1.0119	0.7665
15	0.888	1.0285
16	0.9031	0.8925
17	0.9919	0.9432
18	0.9949	0.9601
19	1.1419	0.9126
20	1.0292	0.9504
21	1.1725	
22	0.8208	
23	0.8827	

Table 2. Continued

Participant	Orientation Path Length (in meters)	
	High Task/High Ego	High Task/Low Ego
24	0.917	
25	1.1065	
26	0.9582	
Mean Length	0.9402	0.9575

Qualitative Analysis

Attentional foci statements, provided on the self-focus questionnaire, were coded by the investigators using qualitative methods, following procedures done by LeCompte and Schensul (as cited in McCaughtry, 2004). The investigators read through statements to find similarities and attempted to determine the direction of each participant's attentional foci. Participants ($N = 46$) from the high task/high ego and high task/low ego group were analyzed within each group to identify emerging categories that were later categorized into common themes.

High Task/High Ego

The statements from each of the participants ($n = 26$) were coded and put into the following twelve categories as they emerged from the data, these were (1) concern for the research design, (2) self-conscious/self awareness, (3) skill strategies, (4) extraneous, (5) desire to perform well, (6) compliance, (7) focus on researchers, (8) external/environment, (9) task difficulty, (10) external/tactile, (11) time, and (12) participation benefits.

Category 1: Concern for research design

This category included all comments that involved the instruments used in the study, for example Mark stated, “[I] wonder how the pad and measurements I was standing on works?” While Jayne remarked “I wondered how the instrument worked that I was standing on.” The purpose of the study was a second subcategory that arose with

statements such as “What were they measuring?” and “I wonder what the purpose of this [is]?” A final subcategory was the participants’ personal contribution to the study for example Bill stated “[I was] thinking about if I was doing anything wrong.” As well as Sarah stating, “I was thinking whether I was standing correctly.”

Category 2: Self-conscious/self awareness

The self-conscious/self awareness theme included comments reported by the subject that included remarks about their personal appearance “I hate looking at myself in the mirror” and “I think I look fat in this shirt.” Another subcategory regarding observations the participants made about their performance on the balance task, “my left foot seems to always be a little more forward than the other” and “my feet moving back and forth while staring at the mirror.” A third subcategory involved statements about the participants body awareness “I can feel myself rock slightly using all the little muscles to remain balanced” as well as “I was putting more pressure on my left leg.” The final subcategory to arise was a fear of being unsuccessful at the task, for example Erinn stated, “I was thinking at some points if was going to fall over because the foam was not very steady.” While Josh remarked “don’t fall over.”

Category 3: Skill strategies

Statements categorized into this theme were those that involved the participant’s attempts to perform the balance to the best of their ability. These included: mental focus, visual focus, specific focus on various body parts, and focus on movement of the body. The mental focus comments included statements such as “I was also thinking about not thinking about balancing because sometimes it’s easier to let second natures work themselves” and “I cleared my head.” Visual focus included comments such as “trying to focus by reading the bulletin board so I could keep my balance” and “focus on the wall

you're looking at." The final two subcategories were similar in that both involved focus on the body, however, the specific focus included all comments involving a particular part of the body, for example "keeping my feet as close together as possible" and "moving my ankles in accordance with the movement of the foam." This differed from the body category that included all statements regarding the a cumulative effort by the participant without focus on one particular area, such as "I tried not to move or sway at all" and "really trying to stand still."

Category 4: Extraneous

All comments that were not directly related to the studies were placed into this category and were grouped in one of three subcategories according to tense: past, present, and future. Past tense included all statements regarding thinking about something that had already occurred, for example "the flyers loss to the bruins last night" and "I can't believe I didn't go to class again today." Present tense included thoughts about feelings at the moment, such as Katie stating "I'm kind of sleepy" and David remarking "[I was] running through a song in my head." Finally, future tense included comments regarding what the subject would be doing upon completion of the study, later in evening, or within the upcoming week for example, "the concert I am going to on Wednesday" and "where I'm going out tonight."

Category 5: Desire to perform well

Subcategories that developed in this category included all statements about wanting to perform the best, performance in regards to others, and self-accomplishment. Statements about best performance and performance in regards to others differed in that the former was focused on becoming the best performer for example "I want to get [the] best results for [the] study" and "...even though there was no one around or any

conceivable gain, I wanted to be the ‘best’ balancer. The latter included statements about how well other individuals had done on the task, including statements such as, “how did other students do on the experiment?” and “if I was moving a lot or a little compared to everyone else.” The self-accomplishment subcategory provided statements like Justin remarking “whenever I maintained my balance on the front of my feet for a good amount of time without shifting, I felt a sense of accomplishment.”

Category 6: Compliance

This theme arose from all comments that were directly related to the instructions given by the researcher prior to performance. Any statements that the subjects wrote regarding following the researchers’ directions were placed into this theme, for example “I kept reminding myself to find a comfortable position and find my balance before the timing began” and “facing forward.” No sub themes were found within this theme as there were minimal instructions given to which subjects could have reported.

Category 7: Focus on researchers

This category included statements regarding what the researchers (in the lab) were observing/thinking during the subject’s participation as well as what the researchers were doing during the performance. These two categories differed in that the first involved what the researcher was thinking about during the performance for example, “what is she looking at over there?” and “what the researchers were looking for.” While the second category included statements about the instruments being used by the researcher, such as “I wonder if she is changing the surface I’m standing on somehow” and “I wanted to see what was on the screen you were looking at.” A third sub theme also arose in that was statements about the subjects’ relationship with the researcher, but was only noted by one participant “The ‘D’ I got in Kim’s class.”

Category 8: External/environment

All comments that included seeing and hearing anything inside or outside (in the case of hearing) of the laboratory. Participants reported statements of any visual items that were seen but not used as a focal strategy such as “looking at the poster on the wall” and “reading the bulletin board in front of me.” The second subcategory included statements about anything heard by the participant such as “it’s quiet” and “[I was] thinking about the people playing basketball on the other side of the wall.”

Category 9: Task difficulty

Statements in this category involved anything regarding the difficulty of the balance task. These comments specifically were categorized as the difficulty of the task being too easy such as, “I thought ‘that’s all there is to it?’ I was expecting some kind of challenging physical maximum stress balance activity” and “I wondered if there was anything more to it and what they could possibly be measuring.” No other sub categories arose.

Category 10: External/tactile

The external/tactile included statements about the foam pad that the participants were standing on, for example John stating, “it feels like a weird gel pad” and Kyle stating, “how the pad was very cushy.” While external, these comments were placed in a theme separate from environment because of the relationship of the foam pad to the body. One sub category regarding the temperature of the lab was also placed in this theme, “that it was really hot in there.”

Category 11: Time

All time statements were placed into one of two subcategories, these were: performance duration and study duration. These categories differed in that the first

included statements about participants counting during performance for example, “concentrating on the length of time” and “I was thinking about exactly how long 20 seconds is.” While the second included statements of when the study would be complete such as, “how much longer” and “I wonder how long I have to do this for?”

Category 12: Participation benefits

Participation benefits included all statements regarding what the subject could receive from participating in the study, for example “how many bonus points I’m getting” and “If I can get any extra ‘extra credit’ for actually participating?” All of the statements included comments about “extra credit” that was offered by their instructor for participating in the study.

Major Themes

The above categories were further collapsed into themes (see Table 3). The three themes that comprised each of the categories included (1) performance influences, (2) research setting enigmas, and (3) concerns of self.

Table 3. High Task/High Ego Themes

		Themes		
		Performance influences	Research setting enigmas	Concerns of self
Categories		Self-conscious/self awareness	Concern for research design	Extraneous
		Skill strategies	Focus on researchers	Time
		Desire to perform well	External environment	Participation benefits
		Compliance		
		External tactile	Task difficulty	

High Task/Low Ego

The statements from each of the participants ($n = 20$) were coded and the following eleven categories emerged: (1) concern for the research design, (2) self-conscious/self awareness, (3) skill strategies, (4) extraneous, (5) desire to perform well, (6) focus on

researchers, (7) external/environment, (8) task difficulty, (9) external/tactile, (10) time, and (11) participation benefits.

Category 1: Concern for research design

This category included all comments that involved the instruments used in the study, for example Adam stated, “I was wondering about the machinery testing my balance.” While Carrienne remarked “How does this thing measure balance?” The purpose of the study was a second subcategory that arose with statements such as “I was thinking what was the point of this research?” and “I also thought about how these tests could be used for research – what was being studied?” A final subcategory was the participant’s personal contribution to the study for example Thomas stated “I was wondering what I answered that made me applicable for the second part?” As well as Megan stating, “I was thinking about whether I was supposed to look forward or not (if I was allowed to look around).”

Category 2: Self-conscious/self awareness

The self-conscious/self awareness theme included comments reported by the subject that included remarks about their personal appearance “wow, I really need to lose more weight” and “I looked in the mirror and was thinking about the size of my legs...I need to start running more!” Another subcategory regarding observations the participants made about their performance on the balance task, “I wondered if my feet were really positioned the same each time” and “why was I wobbling or appeared to have difficulty standing still?” A third subcategory involved statements about the participants body awareness “[my] weight shifts from my heels to balls of [my] feet” as well as “it seemed that once I shifted my balance, my whole body could be felt sort of swaying and attempting to compensate for that feeling of being out of balance.” The final subcategory

to arise was a fear of being unsuccessful at the task, for example Barry stated “at first I was afraid of falling off the mat.” While Aaron remarked “don’t fall off the blue pad.”

Category 3: Skill Strategies

Statements categorized into this theme were those that involved the participant’s attempts to perform the balance to the best of their ability. These included: mental focus, visual focus, specific focus on various body parts, and focus on movement of the body. The mental focus comments included statements such as “I tried not to allow voices or noises to affect my balance. Overall, I just felt extremely aware of my body and how it ‘felt’ standing there.” and “The ticking noise – trying to make it stop.” Visual focus statements included, “to focus on the object in front of me” and “I tried looking at myself in the mirror for more focus – that didn’t work because it caused me to lose my concentration on balancing. The final two subcategories were similar in that both involved focus on the body, however, the specific focus included all comments involving a particular part of the body, for example “I tried stiffing my body a little – for instance my legs” and “staying on the balls of my feet.” This differed from the body category that included all statements regarding the a cumulative effort by the participant without focus on one particular area, such as “keeping up straight” and “keep my balance.”

Category 4: Extraneous

All comments that were not directly related to the studies were placed into this category and were grouped in one of three subcategories according to tense: past, present, and future. Past tense included all statements regarding thinking about something that had already occurred, for example Charlie stated “if I can figure out the homework I was working on just before I entered the study” and Sam stating, “My sore knee from playing volleyball yesterday.” Present tense included thoughts about feelings at the moment, such

as Candice stating “I wondered what other studies take place here” and Nicole remarking “[I] started craving a candy bar and thinking about where and if I should get one.”

Finally, future tense included comments regarding what the subject would be doing upon completion of the study, later in evening, or within the upcoming week for example, “[the] two tests I have next week” and “I was thinking about cleaning my house this afternoon.”

Category 5: Desire to perform well

Subcategories that developed in this category included statements about performance in regards to others, and self-accomplishment. Statements about performance in regards to others included “I wondered if anyone had difficulty balancing on the foam.” Statements about self-accomplishment included “I wonder how I’m doing (in the study)” and “I wondered if I was a ‘good balancer’ or if I was moving too much.”

Category 6: Focus on researchers

The only subcategory to arise referred to statements regarding what the researchers (in the lab) were observing/thinking during the subject’s participation. There was only one statement in this category Tony stating “I wondered what you were measuring/looking at.”

Category 7: External/environment

All comments that included seeing and hearing anything inside or outside (in the case of hearing) of the laboratory. Participants reported statements of any visual items that were seen but not used as a focal strategy such as “[I] was reading the bulletin board in front of me” and “then, I started reading the table in front of me, the information about benefits of aerobic exercises.” The second subcategory included statements about anything heard by the participant such as “I was noticing the noise going on outside the

experiment, people talking, people entering/leaving the lab” and “I thought it was interesting that Norah Jones is playing in the background.”

Category 8: Task difficulty

The lone statement in this category involved the difficulty of the balance task. This comment was categorized as the difficulty of the task being too easy, Mike states “why is this balance test so easy?” No other sub categories arose.

Category 9: External/tactile

The external/tactile included statements about the foam pad that the participants were standing on, for example Cheryl stating, “mostly I was thinking about the squishy pad” and Kim stating “[I] thought about how comfy the mat was – do they make beds like this?” While external, these comments were placed in a theme separate from environment because of the relationship of the foam pad to the body.

Category 10: Time

All time statements were placed into one of two subcategories, these were: performance duration and study duration. These categories differed in that the first included a statement about participants counting during performance, for example “I counted a bit in my head.” While the second subcategory included statements of when the study would be complete such as, “I’m going to do this for half an hour?” and “yeah! I was excited because I was almost finished.”

Category 12: Participation benefits

Participation benefits included one statement regarding what the subject could receive from participating in the study, Jeff states “whether I needed to get a piece of paper or documentation proving to [my teacher] that I participated.”

Major Themes

The above categories were further collapsed into themes (Table 4). The three themes that comprised each of the categories included (1) performance influences, (2) research setting enigmas, and (3) concerns of self.

Table 4. High Task/Low Ego Themes

		Themes		
		Performance influences	Research setting enigmas	Concerns of self
Categories	Self-conscious/self awareness		Concern for research design	Extraneous
	Skill strategies		Focus on researchers	Time
	Desire to perform well		External environment	Participation benefits
	External tactile		Task difficulty	

CHAPTER 5 DISCUSSION

The purpose of this study was to determine the influence of one's achievement goal orientation on attentional focus during a mastered motor task. Achievement goal orientation (AGO) is comprised of two distinct conceptions of ability that result from an individual's perceived level of competence, task-involvement and ego-involvement. Task-oriented individuals perceive that ability is undifferentiated from effort and that competence is increased when more effort is given (Nicholls, 1984). Ego-oriented individuals perceive that ability is differentiated from effort and that maximum effort can show one's true ability level and thus these individuals may choose to participate if prior success has been achieved (Duda & Hall, 2001) or elect not to participate in order to avoid failure (Nicholls, 1989; Covington, 1992).

Individuals possess both of these orientations and can be categorized in one of four combinations: high task/high ego, high task/low ego, low task/high ego, and low task/low ego. While all four combinations are possible this particular study was only able to use participants possessing either a high task/high ego orientation or high task/low ego orientation. Due to the population chosen for the study, university undergraduates, it is believed that low task individuals might be more rare in the academic setting, which requires some motivation in order to achieve success. Additionally, the classes from which the participants were selected were predominately activity based courses and thus apathy towards activity may be less likely to exist in this setting. Furthermore, due to the potential that exists for highly ego-oriented individuals to elect not to participate, for fear

of failure, it is possible that because of the lack of a high task orientation many of these individuals do not sign up for these courses.

Balance Performance

The results of this study did not indicate a significant performance difference in the average path length of participants in the high task/high ego groups, t -obtained = .54 ($\alpha = .05$). This may have been due to the individuals having little difficulty performing the task. However, had a more complex task been used to produce greater variances in performance, the skill of the participants might have had more of an influence than motivation. The balance task allowed for an accurate reading of performance and possibly more sensitive measures than path length may reveal significant differences.

The inclusion of two highly task-orientated groups may account for the lack of a significant difference. While the two orientations did differ in the level of ego-orientation present both were high task groups. Highly task-oriented individuals put forth effort in order to master a task, thus the presence of ego orientation may not have significantly contributed to performance. One would assume that had the extreme orientations of high task/low ego and low task/high ego been used there may have been significant difference in performance. This difference would be due to the each group's respective perception of ability and effort. As previously stated, the population selected for this study did not provide significant subjects in the low task/high ego group and thus those participants could not be used.

Future research is needed to determine if any mastered motor task would produce different performances regardless of orientation. Determining if one's achievement goal orientation has any influence on the performance on a mastered motor task is needed to

further evaluate all four-orientation groups. While the literature supports differences in task- and ego-orientations it is still unknown how each combination influences the other. Research is also warranted to determine if a lack of a high task-orientation has a significant difference on performance. Due to the present findings showing no significant differences between two high task-oriented groups it is possible that task-orientation may have a stronger influence during performance than ego-orientation. Present research has yet to provide evidence of this.

Qualitative Analysis

High Task/High Ego

Individuals demonstrating a high task-/high ego- orientation possess several characteristics contributing to their motivation for participating in a task. Task-oriented individuals are motivated to participate to achieve task mastery as well as individual improvement. Ego-oriented individuals are motivated to perform the “best” or at least to be more successful at an activity than those participating. Thus, it seems that the combination of high task-/high ego-orientations provides these individuals with several motivations within an activity from which to drive their effort.

Three themes described what high task/high ego individuals attend to during a mastered motor task. These were (1) performance influences, (2) research setting enigmas, and (3) concerns of self.

Theme 1: Performance influences

Participants in the high task/high ego group reported attending to how they perceived they were doing in the study. This group showed a high tendency to comment on how they looked in the mirror with statements that were specific to performance as well as personal appearance. This is consistent with the literature in that self-awareness is

an ego involving condition. Additionally, comments such as “don’t fall over” and “[I was] hoping I didn’t fall off the platform” would be those of both high task- and high ego-oriented individuals. High task oriented individuals would have challenged themselves to not fall off as that would inhibit task mastery while high ego oriented individuals would be concerned that falling off would indicate a low level of ability.

These participants were very focused on applying many strategies to perform well at the task. While it was a mastered balance task, the inclusion of the foam pad contributed to some movement. Thus, standing perfectly still would have been a challenge. Therefore, high task-oriented individuals would put forth more effort to master the balance task. Additionally, high task-oriented individuals would use strategies to perform as well as they could, while high ego oriented individuals would cue themselves so that they could perform the best balance. While the purpose of the study was unknown to the subjects they acknowledged that staying balanced was of importance and thus comments such as “trying to stand still” and “trying not to sway back and forth” indicate that success at the skill was a goal. High task-oriented individuals would want to master balance, while high ego-oriented individuals would want to prevent from falling off for fear of providing evidence that they could not do the task.

Having an interest in performing well at the task was another focus of these individuals. They reported statements of “wanting to get the best results for the study” this is consistent with the beliefs that high ego-oriented individuals elect to participate in activities to perform better than other individuals. Additionally, this group also listed concerns about how they were compared to previous participants, again demonstrating an ego-orientation for referencing their own performance to others.

Following the instructions of the study was another goal of the high task/high ego group. They reported items that were consistent with the directions given to them by the researcher. The cue to perform as they had been instructed is highly task involved, as mastery is a concern with this orientation. High task-oriented individuals may also take this as a challenge to comply with the instructions and master the task despite constraints placed on them.

The presence of the blue pad contributed to statements from this group. The pad prevented them from holding a perfect balance and thus high task-oriented individuals may have again seen this as a challenge to put forth more effort to stay balanced. However, if they felt the task was not challenging, high ego-oriented individuals would possibly directed their attention to the foam pad due to boredom.

Theme 2: Research setting enigmas

This theme provided statements regarding questions about what was being tested as well as what the purpose of the study may have been. Questions such as “why do they have a mirror” may have been due to a high ego-oriented individual being concerned about self-awareness. The majority of the statements involved what was being measured and the purpose of the study. One would expect that highly task-oriented individuals were challenged to determine what the purpose of the task was so that they could master it. Additionally, highly ego-oriented individuals would have wanted to perform better than other participants and thus tried to determine what was being measured so they could have the best performance. Finally, comments such as “[I was] thinking about if I was doing anything wrong” suggests that ego-oriented individuals feared that they would not perform as well as other individuals if they could not determine what was being measured or the purpose of the experiment.

Similar comments to the purpose of the study included statements regarding the instruments in the research setting as well as the researchers. The inclusion of the comments regarding the researchers is similar to the self-awareness brought on by the mirror. The presence of an audience would have caused high ego-oriented individuals to question if the researchers were evaluating their performance in any way. In regards to the instruments being used questions from participants such as “I wonder if she [the researcher] is changing the surface I’m standing on somehow?” are similar to the statements regarding what was being done in the study. High ego-oriented individuals would again report wanting to determine all that they could about the study so to perform the best at it, while high task-oriented individuals would have wanted to be further challenged if they felt the task was simplistic.

The wall in which participants were instructed to face was another stated foci. However, these comments differed from following directions and included statements regarding what was observed on the wall. Furthermore, statements about the wall were not in reference to using it as a strategic focal point. Again, these comments would have been brought up by both orientations; if high task-oriented individuals did not feel challenged they may have directed attention elsewhere while the high ego-oriented individuals would have been bored with the task.

Finally, the participants included comments regarding the simplicity of the study. High task-oriented individuals would have mastered the task, to the best of their knowledge, and wanted an additional challenge. This is interesting because high ego-oriented individuals would be unlikely to make comments regarding the difficulty of the task since the results of performance were unknown. However, this group would list

these comments if they knew they were being compared to comments of other individuals.

Theme 3: Concerns of self

The majority of the statements in this theme involved various comments having nothing to do with the balance task or the lab setting. Many of these included thoughts about what the participant would be doing later in the evening as well as within the week. Due to the perceived simplicity of holding a two foot balance high task-oriented individuals would have felt unchallenged and thus allowed other things to occupy their thoughts. Additionally, high ego-oriented individuals would have become bored and chose to think about other things not specific to the study.

Other comments that were stated included those having to do with how long the participants would be in the study or how long the trial was. Again, if the task was perceived as simplistic and had been mastered, high task-oriented individuals would be attending to other things. However, statements specific to the time left in the trial would be given by a highly ego-oriented individual if they were trying to prevent from showing a lack of success during the trial or if they wanted to demonstrate success for the entire trial. Additionally, high task-oriented individuals would be attempting to master holding the balance for the entire trial.

Finally, the remaining statements from participants in this theme were specific to what they might receive for participating in the study, (e.g., extra credit). Due to the lack of other participants from which to compete against in the study, high ego-oriented individuals would attend to other motivations for participating.

High Task/Low Ego

Individuals demonstrating a high task-/low ego- orientation are more motivated by task mastery and self-improvement than from outperforming others. These individuals believe that ability is improved by effort and thus would exhibit high levels of effort with a challenging task. However, if a task is deemed easy or simplistic high task-oriented individuals may give minimal effort as required by the task.

Three themes described what high task/high ego individuals attend to during a mastered motor task. These were (1) performance influences, (2) research setting enigmas, and (3) concerns of self.

Theme 1: Performance influences

The statements provided in this theme involved comments regarding their physical appearance (as seen in the mirror) as well as what was observed about their own performance. The inclusion of self-awareness, an ego involving condition, would be present in this group because ego-orientation still exists. A high task-oriented statement from this theme involved the task becoming easier each trial. This is consistent with the belief that task mastery and continued challenge are characteristics of high task-oriented individuals.

Several statements were involved with keeping balance through a variety of strategies. Statements such as “what different parts of my feet that were the most stable so that I could put a majority of weight on those points” and “I began to wonder what could affect my balance and resolved not to let it” are those of high task-oriented individuals working to improve performance and master the task.

Comments that were reported involved wanting to do well on the study involved how they were doing in the study as well as how others had performed. Again, high task-

oriented individuals focus on self-improvement and task mastery thus this statement is consistent with the literature. Thus, the inclusion of thoughts about how others had performed is surprising but can be contributed to possessing some ego-orientation.

Finally, statements regarding the blue pad were seen in this theme. The blue pad prevented the participants from keeping completely still, thus providing a challenge for participants to remain still despite the inclusion of the pad. High task-oriented individuals would exert more effort to master the task and overcome the challenge.

Theme 2: Research setting enigmas

Participants reported thinking about various questions that they had about the study such as why they were selected, what everything was used for, and what the purpose of the study was. High task-oriented individuals would seek to find answers to these questions so they could perform well on the task. The statement “I looked at my surroundings and wondered if the mirror and/or posters were there to distract my balancing” supports that high task-oriented individuals are concerned with any potential challenges present so they may attempt to achieve success despite them.

One similar statement to the research setting was a concern about what the researchers were measuring. The high task-oriented individual would be interested in what they were doing to make sure that they were attempting to perform the task accordingly, thus to achieve mastery.

Statements specific to the setting but in regards to what was surrounding the participants. Comments included the wall that the participant was facing as well as noises within and just outside the lab. Due to the perceived simplicity of the task, participants may have not needed to give maximal effort thus allowing additional attentional capacity to focus on items not directly related to the study.

Finally, a lone statement existed that questioned why the task was so easy. As previously stated a high task-oriented individual mastered the task and was determining if there was more to it. This may indicate that high task-oriented individuals will look for additional things to attend to if all of their focus is not required for a task.

Theme 3: Concerns of self

This theme included statements regarding focus being directed to items not involved with the study. Comments such as past, present, and future events indicate that the high task-oriented individuals were able to master the task, to the best of their knowledge, and attend to additional items, without fear of performance decline.

Additionally, items were included that involved how long the study would take and the amount of time remaining within a trial. Again, attentional demands on the task were minimal for these individuals and due to the task's simplicity they were able to focus on other things.

Finally, one comment was found that involved proving that the participant had completed the study so to receive extra credit from the instructor. Thus indicating that the participant had found the task simplistic and was able to focus on other attentional interests.

Qualitative Comparison

When coding statements from both orientation combinations (high task/high ego and high task/low ego) observations were made regarding the responses of individuals. Each orientation involved cases in which participants listed statements that were predominately involved in one category. Additionally, both groups produced cases in which participants listed statements that fell in a variety of categories. Finally, both

groups included statements that were written in depth as well as some that were short in word length.

Predominate similarities that existed between the two groups were the themes that arose from the collected statements. These were (1) performance influences, (2) research setting enigmas, and (3) concerns of self. Additionally, except for one category (compliance) the two groups produced the same categories. This may have been due to the presence of a high task-orientation in both groups.

Differences were found in the percentages of statements for each orientation combination in all three themes (see Figure 3). High task-/low ego- orientations produced a higher percentage of statements in the Performance Influences and the Concerns of Self themes than the high task-/low ego-orientations. High task-/high ego- orientations produced a higher percentage of statements in the Research Settings Enigmas theme. Additionally, a key difference between the two groups was found in this theme. The number of statements in the *focus on researchers* category produced different subcategories. Only one subcategory in the high task/low ego group was found while three were found in the high task/high ego group. Moreover, the number of statements recorded in this category for the high task/low ego group was small in comparison to the high task/high ego group, 1 statement to 12 respectively. These findings are consistent with Carver and Scheier (1978) who found that the presence of an audience or a mirror can increase self-attention and is considered an external focus. Which as Nideffer (1976) suggests self-awareness is an ego-involving condition that may decrease interest in task mastery. Thus, an individual who possess a higher ego score may be more likely to

report attending to the presence of an audience than those possessing a low ego score, which is consistent with the literature.

What was most interesting when comparing the two groups was that despite differences in the level of ego-orientation inclusion, many of the findings were similar. All three themes were the same as well in all but one category. One would assume that the presence of a high ego-orientation, due to its' undifferentiated beliefs on effort and ability, would produce a greater difference in focus statements than were found. Thus, the presence of a high task-orientation may have a greater influence on a persons' behavior than high ego-orientation.

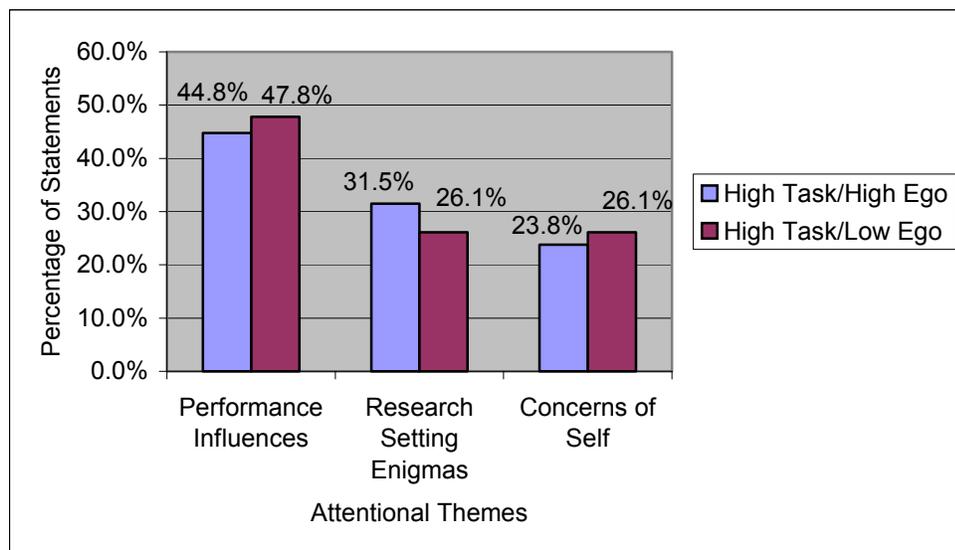


Figure 3. Attentional Foci During Balance Performance

Implications and Future Research

The study revealed that there was no significant difference in balance performance between two different achievement goal orientation combinations. This may have been due to a couple of factors, these being the task as well as the orientation combinations used. The mastered motor task used in the study was a two-foot balance task and may not

have produced differences due to its simplicity. Future research is needed to determine if different tasks may produce any differences between orientations.

The achievement goal combinations in the study involved a high task-orientation in both combinations. The presence of a high task-orientation may have limited differences in both task performance and attentional focus reported. Unfortunately, the population selected for the study did not provide a significant number of subjects in the two low task-orientations. Future research is warranted to determine if other achievement goal orientations combinations produce different performances as well as attentional focus. Additionally, different populations should be used (e.g., college students not in physical activity courses, non-college students, children) in order to find participants from each one of the achievement goal orientation combinations.

While only two orientation combinations were used in the study, the presence or absence of high ego-orientation did not produce significant differences. This may indicate that combinations involving high task-orientation may dominate over those with a high ego-orientation. Thus, more general research is needed on goal combinations to determine what influence they may have on one another.

The findings from this study indicate that there is a great deal of research still needed to determine how motivation may influence attention. Additionally, it remains unclear what effect achievement goal orientation has on the performance of a mastered motor task. Thus, theorizing on how AGO may influence learning a new task cannot yet occur. While the information provided does offer evidence that can be used as a basis to guide future studies, practical implications in a teaching setting cannot be applied at this time.

APPENDIX A
TASK AND EGO ORIENTATION IN PHYSICAL ACTIVITY QUESTIONNAIRE

Name: _____ Phone #: _____

Email: _____

Gender: Male Female

Age: _____

Ethnicity: African American Latino/Hispanic Asian Caucasian
 Native American Other: _____

Do you have any lower extremity conditions or vestibulo cochlear disorders that may limit your performance in a balance task?

DIRECTIONS: Give your reaction to the following statements in regards how you usually or generally feel about the your feelings of success when performing physical activities. You are asked to circle your agreement of success for each item using a 5-point scale, 1 indicating strong disagreement and 5 indicating strong agreement.

I feel most successful performing physical activities when...

1. I'm the only one who can perform the necessary skills.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

2. I learn a new activity and it makes me want to practice more.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

3. I can do better than my friends.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

4. The others can't do as well as me.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

5. I get the knack of doing a new activity.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

6. Others mess up and I don't.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

7. I learn a new activity by trying hard.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

8. I work really hard.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

9. I score the most points/goals/hits, etc.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

10. I can keep practicing hard.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

11. I'm the best.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

12. An activity I learn really feels right.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

13. I do my very best.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

14. I beat the others.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

15. I'm more skilled in the activity than other people

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

16. I do something that I couldn't do before.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

APPENDIX B
SELF-REPORT QUESTIONNAIRE

Directions: Please legibly answer the following question in the six provided spaces.

What were you thinking about when performing the balance task?

1.

2.

3.

4.

5.

6.

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BIOGRAPHICAL SKETCH

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