THE PURSUIT OF OPTIMAL PERFORMANCE: THE EFFECT OF MASTERY- AND EGO-ORIENTED FEEDBACK ON SPORT PERFORMANCE, TASK DIFFICULTY SELECTION, CONFIDENCE, AND ANXIETY

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Within an achievement motivation theoretical framework, there are factors thought to most heavily influence performance and task difficulty selection. More specifically, motivational climates, feedback, confidence, and anxiety have all been identified as important factors influencing outcomes within performance settings. Much of the literature in the area of achievement motivation has focused on the effects of mastery- and ego-oriented feedback on performance within academic settings and has received limited attention in the sport psychology literature within an athletic setting. Given the demonstrated effects of mastery- and ego-oriented feedback on performance, the importance of performance within the athletic context, and the scant literature examining the effects of feedback on athletic performance, the influence of feedback on sport performance needed to be empirically examined. The primary aim of this study was to provide a clearer understanding of the relationship of factors influencing athletic performance, with the ultimate goal of moving research toward a greater understanding of how optimal performance is achieved. As a result, this research may prove applicable to researchers, coaches, and athletes working toward optimal performance. In this study, I examined how mastery- and ego-oriented feedback influenced youth athletes’ soccer performance, task difficulty selection, confidence, and anxiety. Youth soccer athletes \((n = 71)\) participated in a soccer kicking task consisting of two trials. Between subjects ANCOVA analyses revealed athletes receiving mastery-oriented feedback performed significantly better on the soccer kicking task than athletes receiving ego-oriented feedback. No differences were discovered on task
difficulty selection, confidence, or anxiety. Providing athletes mastery-oriented feedback before or after skill execution could be helpful in the development of athletic skill development and performance. Limitations of the present study and questions to examine in future research are also discussed.
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CHAPTER 1
INTRODUCTION

For the purposes of this paper, sport performance is defined as engaging in a meaningful task holding an evaluative aspect within a sporting environment. Sport performance is influenced by numerous factors, none arguably more influential than motivational climate. The motivational climate, the environment in which an athlete practices or competes, is primarily set by coaches. Other social agents such as parents and peers can also influence the motivational climate in sport.

Feedback plays an important role within the motivational climate and is a fundamental element to the teaching structures contributing to mastery- or ego-oriented goal orientations (Ames, 1992). Mastery-oriented (or growth-oriented) feedback is utilized in an attempt to reinforce someone’s focus and use of aspects within intrapersonal control (e.g., effort, attitude, goal setting). Mastery-oriented feedback mirrors an individual’s mastery-oriented mindset, where hard work and effort are believed to lead to enhanced ability. Conversely, ego-oriented feedback emphasizes natural talent or ability level and variables not within one’s control (e.g., other athletes’ ability levels, referee judgments, weather conditions). Ego-oriented feedback mirrors a fixed mindset, where naturally acquired ability levels are believed to be set at birth. Individuals who constantly hear ego-oriented language may come to believe that their ability is fixed and cannot be developed.

The effects of feedback within a motivational climate on sport performance have been minimally examined. In this study, I aimed to examine the effect of external feedback on athlete performance within the motivational climate of the sporting environment. I also aimed to examine the effect of external feedback on athlete decision making, anxiety, and confidence within the sporting environment. Understanding the effects of external feedback on athlete
performers has important implications for psychological researchers attempting to understand factors influencing human performance.

The behaviors executed within the different achievement-oriented activity domains are thought to occur as a result of individuals' achievement motivation (Crandall, Katkovsky, & Preston, 1960). Crandall et al. (1960) define achievement behavior as,

> behavior directed toward the attainment of approval or the avoidance of disapproval (the goal) for competence of performance (characteristic of the behavior) in situations where standards of excellence are applicable (nature of the situation).\textsuperscript{p. 789}

Like most concepts in the achievement goal literature, motivational climates were studied in the classroom before they were studied in the athletic environment. Covington and Omelich (1984) discovered that task-oriented learning structures promoted and sustained task-involvement, persistence, and improved performance. Ames (1992) posited motivational climates are either mastery-or ego-oriented. Following Covington and Omelich's (1984) finding, Ames argued that (a) teachers can enhance the motivation of their students through a design of mastery-oriented classroom structures, (b) mastery-oriented classroom structures will be influenced by the teachers own belief and goal system for helping children learn, and (c) children immersed in mastery-oriented motivational climates would be influenced to value effort more highly and make a higher commitment to effort-based strategies.

Motivational climates and their effects were later studied within the athletic setting. Smith, Smoll, and Cumming (2009) found achievement-related motivations for youth athletes are influenced by the motivational climates created by coaches. When motivational climates were perceived as mastery-oriented, significant increases in mastery goal orientations and significant decreases in ego goal orientations were found. When motivational climates were perceived as ego-oriented, significant increases in ego goal orientations and significant decreases in mastery goal orientations were discovered. The results held regardless of athlete age (9 to 13)
and gender. Further, ego- or mastery-motivational climates were individually determined (as opposed to team determined), meaning individual perception of the motivational climates was more salient in goal setting orientations than team based motivational climates a coach was attempting to establish.

Perceived motivational climates may also have to do with athletes’ perceptions of coach feedback after good performances. Stein, Bloom, and Sabiston (2012) discovered ego-oriented motivational climates were perceived when athletes wanted more informational and positive feedback than they felt they were getting from their coach. Additionally, task-oriented motivational climates were perceived more highly when the athletes perceived their coach to be ignoring their good performances. Alvarez, Balaguer, Castillo, and Duda (2012) discovered youth male soccer players perceived mastery-oriented coach-created motivational climates were positive predictors of the satisfaction of athlete psychological needs, autonomy, relatedness, and competence (Ryan & Deci, 2000), whereas perceived ego-oriented coach-created motivational climates were negative predictors of relatedness. Perceived mastery-oriented motivational climates were predictive of intrinsic motivation, psychological well-being, and future intention to participate in sport (Cerasoli, Nicklin, & Ford, 2014).

Just as motivational climates were first explored in academic settings, so was feedback and its relation to performance. Schunk (1982) found that effort attributional feedback of past performances led to future mastery acquisition of subtraction skills, greater skill development, and higher self-efficacy in 7 to 10 year olds. Schunk argued that the way teachers provided feedback to their students had a differential effect on personal efficacy and behavior. Mueller and Dweck (1998) measured the effects of growth/task-oriented and fixed/ego-oriented feedback on an intelligence based performance task in a youth student population. Students receiving growth-oriented mindset language feedback from the experimental instructor performed
significantly higher, persevered longer on impossible tasks, and selected more difficult tasks at follow up than students receiving fixed-oriented mindset language (they also showed higher levels of grit and enjoyment in the tasks).

Gershgoren, Tenenbaum, Gershgoren, and Eklund (2011) completed the only known study involving the effect of ego- and mastery-oriented feedback in an athletic context. The researchers examined the effect of parental feedback on athletes’ perceived motivational climate (PMC), goal involvement and orientation, and penalty kick goal performance within a youth soccer setting. The parental feedback was either task-oriented or ego-oriented. Athletes’ ego-involvement significantly increased after they received ego-oriented feedback. Additionally, soccer players who were exposed to task-feedback experienced significant increases in mastery-PMC and task-involvement and decreased significantly in ego-PMC and ego-involvement. Task-oriented feedback was also found to undermine a performance perceived motivational climate. Lastly, task-involvement was found to serve as a buffer against ego-oriented feedback, meaning task-involved individuals may be less susceptible to change their goal orientations than ego-involved individuals. This study has several important implications in that it shows one statement external feedback (ego- or mastery-oriented) has the power to change athletes’ perceived motivational climate and goal involvement and appears to serve as a buffer against ego-orientation feedback. However, this study has several significant limitations in that it does not report actual performance comparisons between participants who received mastery- or ego-oriented feedback from a social agent (parent). This study also did not present findings related to the internal psychological states of participants and how those states were influenced by the mastery- and ego-oriented feedback. The present study addresses both of these limitations by reporting performance and psychological states comparisons between participants receiving mastery- and ego-oriented feedback.
Feedback can not only potentially influence athlete performance on sport-specific tasks, but it can also influence other internal psychological states, namely confidence and anxiety. Perry (2011) contends self-confidence is a person’s belief that he or she can succeed, is context specific to particular tasks (p. 219) and can be related to self-efficacy theory. Bandura’s (1977) model of self-efficacy was based on the premise that sources of confidence emanate from four different dimensions: performance accomplishments (competency), vicarious experience (viewing others succeed), physiological states (how our body feels), and verbal persuasion (praise and encouragement). Bandura’s model has been applied in the creation of self-efficacy scales in numerous different areas of study, suggesting it is a well-respected, universal, and important model in understanding confidence and performance. Bandura’s (1986) related social cognitive theory model of perceived self-efficacy was later supported by Pajartes (1996), who argued that measures of self-efficacy corresponding to relevant tasks and critical to performance are better than global measures of confidence in predicting outcomes. Recently, the self-efficacy model has been utilized (and validated) in a music performance self-efficacy scale (Zelenak, 2010) and golf-self efficacy scale (Hayslip, Rabb, Baczewski, & Petrie, 2010).

In his review, Wurtele (1986) found that self-efficacy expectancies adequately predicted sport performance. Self-efficacy expectancies are defined as beliefs about personal abilities with regard to carrying out a particular behavior and are dynamic in nature (Resnick & Jenkins, 2000, p. 155). In a meta review, Moritz, Feltz, Fahrbach, and Mack (2000) supported Wurtele’s findings by reporting the average correlation between self-efficacy and performance in sport was .38, meaning self-efficacy beliefs have a positive and moderate relationship to sport performance. Craft, Magyar, Becker, and Feltz (2003) also found in their meta-analysis that self-confidence was the most significant predictor of performance within the Competitive State.
Anxiety Inventory (CSAI-2R), a scale designed to measure state cognitive anxiety, state somatic anxiety, and self-confidence levels in athletes.

Wurtele (1986) discovered that positive self-efficacy expectancies can be heightened through a variety of means from Bandura’s (1977) original model of self-efficacy, particularly through previous performance accomplishments. Therefore, when observing athletic performance, it will be important to measure an athlete’s self-efficacy for a sport-specific task as opposed to his or her global confidence or self-efficacy level within the sport or as an athlete. Dweck and Leggett (1988) contend that confidence is a key variable affecting the relationship among theories, goals, and behavior. Further, they contend learning goals protect individual performers from effects of fluctuations in confidence and that high confidence will be hard to maintain by the continued use of performance goals. When confidence in ability is high, performance goals have been shown to produce mastery-oriented behavior. Conversely, if a performance-oriented individual had low confidence in ability, challenging tasks elicited adverse experiences such as high anxiety, negative self-judgments, and loss of self-esteem. As a result of these adverse experiences, individuals were found to orient themselves to easy tasks that minimized the chances they would experience the adverse effects again. Conversely, if an individual had low confidence, but was mastery-oriented, they would not experience the same type of adverse effects after a performance because they would not have failed meeting their goal (which is to learn or give high effort on a task).

In addition to self-efficacy, anxiety is another key psychological state thought to influence sport performance or be influenced by sport performance. Sport performance trait anxiety has been defined as a predisposition to appraise sport situations in which athletic performance can be evaluated as threatening and to respond with state anxiety reactions of varying intensity (Smith, Smoll, & Cumming, 2007, p. 40). Whereas an individual’s sport
performance trait anxiety is seen as stable across all sports, an individual’s state performance anxiety may differ depending on sport and sport task. State performance anxiety is broken down and conceptualized on two different dimensions, as seen on sport anxiety measurements such as the CSAI-2R, into cognitive state anxiety and somatic state anxiety. Cognitive state anxiety involves internal thought processes related to anxiety and somatic state anxiety involves experienced physiological body states experienced as a result of anxiety. Gillham and Gillham (2014) reported cognitive state anxiety originates from both external (spectators, time, competitive level, setting, consequences) and internal (investment, uncertainty, self-confidence, and letting self or others down) sources in athletes from many different sports.

There has not always been agreement in terms of how anxiety affects performance and some researchers have tried advancing the conceptualization of certain types of anxiety. Burton and Naylor (1997) argued that in the 21st century there needed to be a shift in how researchers conceptualized cognitive anxiety and argued that competitive anxiety can be both facilitative and debilitating to sport performance. Eysenck, Derakshan, Santos, and Calvo (2007) assume that anxiety affects the efficient functioning of the goal-directed attentional system and at the same time increases use of the stimulus-driven attentional system and attention to threat-related stimuli. Therefore, anxiety is assumed to have a deleterious effect on our goal-directed internal processing system by diverting attention away from goals to external stimuli, including threats.

Anxiety has been researched over the years in terms of how it affects performance. For example, Krane (1993) discovered youth soccer players performed more poorly when they experienced somatic and cognitive anxiety above their zones of optimal functioning (ZOE). Since it is widely accepted that anxiety can have deleterious effects on athlete performance, researchers have also discovered ways to mitigate those negative effects, such as by creating a
mastery-involving motivational climate (Smith et al., 2007) or using the IZOF model (Hanin, 2000) or self-control (Englert & Bertrams, 2012).

Understanding the effects of the motivational climate on performance has been examined in an academic context and has provided teachers insight on how to provide feedback to students to assist them in performing at a higher level. This study aims to provide similar insight for the coaches, parents, peers, and other social agents who have an influence over an athlete’s motivational climate. This study also aims to examine the relationships between other important components already thought of as crucial to athlete performance, namely, confidence and anxiety. Therefore, in this study, I examined how mastery- and ego-oriented feedback influences (a) performance; (b) task difficulty selection; (c) state confidence; and (d) state anxiety in a sport-specific soccer task among youth athletes.

Hypothesis 1. When given mastery-oriented feedback, soccer players will increase their performance, choose a higher difficulty of kicks, and experience increased confidence and decreased anxiety on a soccer task.

Hypothesis 2. When given ego-oriented feedback, soccer players will not experience a change in performance, will not choose a higher difficulty of kicks, and will not experience a change in confidence and anxiety on a soccer task.
CHAPTER 2

METHOD

Participants

Participants were 71 male varsity or junior varsity soccer players drawn from high schools and select soccer club teams located in a large metropolitan area in the south central U.S. In terms of race/ethnicity, the players were Hispanic/Latino/Mexican American, \( (n = 31, 43.7\%) \), Caucasian/White \( (n = 31, 43.7\%) \), Other \( (n = 4, 5.6\%) \), African-American/Black, \( (n = 3, 4.2\%) \), and Asian American/Pacific Islander players \( (n = 2, 2.8\%) \). Mean age was 15.81 years \( (SD = .82) \); mean years playing organized soccer was 9.38 years \( (SD = 3.57) \). Current cumulative mean GPA reported by the players was 3.73 on a 5-point scale. Two \( (2.8\%) \) players identified as seniors, 31 \( (43.7\%) \) as juniors, 29 \( (40.8\%) \) as sophomores, and 9 \( (12.7\%) \) as freshmen. The mean time spent in practice and competition each week was 8.07 hours \( (SD = 3.77) \) in high school soccer and 3.27 hours \( (SD = 3.61) \) on club teams. The boys reported playing the following positions on their high school teams: 15 \( (21.1\%) \) offense/forward/striker, 32 \( (45.1\%) \) midfield, 18 \( (25.4\%) \) defense, and 3 \( (4.2\%) \) goalie; Three \( (4.2\%) \) players did not play high school soccer. Playing status on their high school teams was: 44 \( (62.0\%) \) starter; 10 \( (14.1\%) \) reserve, but play more than half a game; 12 \( (16.9\%) \) reserve, but play less than half a game; and 5 \( (7.0\%) \) did not play. For those who played on a club soccer team, their primary playing status broke down as follows: 30 \( (42.3\%) \) starter; 6 \( (8.5\%) \) reserve, but play more than half a game; 1 \( (1.4\%) \) reserve, but play less than half a game; and 34 \( (47.9\%) \) did not play. Positions played on club teams included: 3 \( (4.2\%) \) offense/forward/striker; 20 \( (28.2\%) \) midfield; 9 \( (12.7\%) \) defense; 5 \( (7.0\%) \) goalie; and 34 \( (47.9\%) \) did not play.
Instruments

Demographics

Participants provided information regarding their age, race/ethnicity, total number of years participating in organized soccer, number of years playing on their current varsity team (including the present year), current year in school, GPA, types of soccer teams on which they have played (or are playing; club, high school, or both), primary position on each team (offense/forward/striker, midfield, defense, or goalie), and playing frequency on each team (starter, reserve/but play more than half a game, reserve/but play less than half a game, or does not play).

Competitive State Anxiety

The Anxiety Rating Scale (Cox, Russell, & Robb, 1998) provides single items to measure Competitive Somatic State Anxiety (ARS-S; “I feel nervous, my body feels tight and/or my stomach tense”) and Competitive Cognitive State Anxiety (ARS-C; “I feel concerned about performing poorly and that others will be disappointed with my performance”). Each item is scored from 1 (Not at all) to 7 (Intensely so). The ARS-S and the ARS-C, respectively, accounted for 45% ($r = .67$) and 40% ($r = .63$) of the variance of the CSAI-2 subscales for somatic and cognitive anxiety, providing support for their validity (Cox et al., 1998).

State Confidence

Based on Bandura’s (1977) self-efficacy theory and self-efficacy scales, athletes completed one item (“Please rate how confident you are that you can perform the soccer kicking task successfully”) using a scale that ranges from 0 (Not at all confident) to 100 (Completely confident). This type of scale has been used to measure confidence in a variety of performance domains (e.g., Hayslip et al., 2010; Brady, 2011). This scale was named the Confidence Rating Scale (CRS).
Task Performance

Performance was measured based on the players' success in kicking 12 soccer balls into three different goals. Specifically, the players' total score for both Trial 1 and Trial 2 was computed by summing the points scored from successful kicks, which were defined as kicks that made it into one of the three goals, and a time bonus. Point values for each goal were: 10 points for a soccer ball successfully kicked into the goal placed 10 yards away from the player, 15 points for a soccer ball successfully kicked into the goal placed 15 yards away from the player, and 20 points for a soccer ball successfully kicked into the goal placed 20 yards away from the player. Therefore total points scored from the soccer kicks could range from 0 (no successfully made kicks in any goal) to 240 points (12 successfully made kicks in the 20 point goal). The time bonus was computed as: \((120 – \text{seconds to complete task})/10) \times 5\). Therefore, time bonus points could range from 0 (if player took the entire 120 seconds to complete the trial) to 20 (if player took 80 seconds or less to complete the trial). Adding the time bonus to the points scored by successfully kicking the soccer balls into the different goals resulted in an overall total score that could range from 0 to 260 points. For example if a player successfully made 2 kicks into the 10 yard goal, 2 kicks into the 15 yard goal, and 1 kick into the 20 yard goal in 80 seconds, he would score 90 points \((2 \times 10) + (2 \times 15) + (1 \times 20) + (120-80/10 \times 5)) = 20 + 30 + 20 + 20 = 90\).

Task Difficulty Selection

Task difficulty selection was measured based on the goals at which the players shot the balls during the performance trials. The distance of the goal represented the task difficulty. Thus, the 20 yard goal was deemed to be the most difficult goal to kick towards and was weighted highest when computing the task difficulty selection score. The task difficulty selection score was computed by summing the percentage of shots taken at the 10 yard goal.
multiplied by the weighted difficulty of 10, the percentage of shots taken at the 15 yard goal multiplied by the weighted difficulty of 15, and the percentage of shots taken at the 20 yard goal multiplied by the weighted difficulty of 20. As a formula, the task difficulty selection score is best represented by \((\text{shots attempted at the 10 yard goal}/12) \times 10) + (\text{shots attempted at the 15 yard goal}/12) \times 15) + (\text{shots attempted at the 20 yard goal}/12) \times 20\). For example, if a player kicked 4 balls toward the 10 yard goal, 2 balls toward the 15 yard goal, and 6 balls toward the 20 yard goal, the numbers would substitute into the formula as \((4/12 \times 10) + (2/12 \times 15) + (6/12 \times 20)\) for a total of 15.83. The possible task difficulty selection scores range from 10 (very easy) to 20 (very difficult).

Procedure

Following approval from the University of North Texas Institutional Review Board (IRB), high school boys’ soccer coaches were contacted via email to solicit permission for their players to participate in the study. Through email and follow-up phone calls, the researcher explained the general purpose of the study (which was to examine the influence of psychological climate and verbal feedback on soccer performance) and answered any questions they had. After obtaining permission, the researcher arranged a time to visit the team during a scheduled practice to explain the study’s purpose and distribute consent forms for the players to take home to their parents. After obtaining written consent (and assent), which usually occurred within two weeks of the initial meeting, the players completed a packet of questionnaires as part of the larger study. The consent forms and packets were coded by number so data could be matched across all parts of the study. No names (or other explicitly identifying information) were recorded on the questionnaire packets. The pre-study questionnaire packet took approximately 15 minutes to complete (see Appendix A).
Following this initial data collection, the researcher arranged additional times with the head soccer coach to return to the high school or soccer club to implement the shooting task. Between four and six researchers were present to assist with data collection at each shooting task. The shooting task was set up in 10 to 15 minutes and included the kicking box (i.e., a 2 foot by 2 foot area designated by four cones) and three Brava mini soccer goals (22\(\text{H}\) x 31\(\text{W}\) x 18\(\text{D}\)) that were set up at distances of 10 yards, 15 yards, and 20 yards away at 90, 45, and 135 degree angles from the center of the kicking box, respectively. The distances and angles of the goals in the shooting task were determined through pilot testing the task with a women's collegiate soccer team.

After the shooting task was set up, the soccer players participated in the task one at a time. One of the researchers, who had been trained in the methodology (there were four different researchers who rotated through this role), introduced the task using a set of standardized instructions and then gave the player a chance to ask questions about the task to ensure full understanding. Standardized answers also were used to respond to anticipated questions by the players (see Appendix B). Once the instructions were read and questions answered, the participants were ready to perform the task. Prior to starting the actual kicking task, all participants took four practice kicks toward each of the three goals to warm up. This warm-up insured that each player had been equally exposed to the task and kicking balls at each goal. During the warm-up and actual shooting test, the researcher who read the instructions stood behind the player; a second researcher also stood behind the participant and recorded his performance on the practice kicks (i.e., how many he made and attempted at each goal). Between two and three other researchers were out on the field to stop and collect soccer balls from the goals as they were kicked by the participant (see Appendix C for the performance scoring sheet).
Once the player finished the warm-up, he completed the ARS-C, ARS-S, and the state confidence measure (see Appendix A). Then, the player completed the first trial of the shooting task where he could select at which goals he wanted to kick the soccer balls to score the most points possible. After finishing Trial 1, a total score was computed and the researcher who provided the initial introduction to the task gave feedback to the participant on his performance. Based on the condition to which each player had been randomly assigned, the player received either "growth" or "fixed" mindset feedback, which was modified from the work of Mueller and Dweck (1998). The feedback in the task- or growth mindset condition was, "Wow, you scored really well. You must be a really hard working soccer player." Feedback in the ego- or fixed mindset condition was, "Wow, you scored really well. You must be a naturally talented soccer player." Following the feedback, the player was told that he had one more opportunity to complete the task. Prior to doing so, he again completed the ARS-C, ARS-S, and confidence measure. While the player was completing these measures, the researchers set up the 12 balls for the second trial.

Before starting Trial 2, the player was given the standardized instructions for the task ("to score as many points as possible within the two minute time limit." (see Appendix B, Script, Part 2). Administration of the task was the same as in the first condition. Following the completion of Trial 2, the player completed a series of questionnaires that were part of the larger study. As part of these questionnaires, participants responded to an item that asked them to select the type of feedback they received in the study. This item served as the manipulation check for the study.

All participants, after completing these questionnaires and regardless of experimental condition, received a final piece of task- or growth mindset feedback ("You did really well, you must be a hard working soccer player") and were thanked for their participation (See Appendix
B, Script, Part 3). This feedback was offered in order to mitigate any negative effect receiving the ego based feedback may have caused (Mueller & Dweck, 1998). At each school, once all of the players completed the task, they were entered into a drawing to win a locally donated FC Dallas soccer ticket or gift card for food.

Data Analysis

First, missing data were evaluated on the ARS-S, ARS-C, and CRS; only one item out of the potential 273 responses was missing. The missing item was replaced using expectation-maximization. Based on the responses to the manipulation check, 10 participants were removed from the analyses because they either did not respond (n = 2) or they incorrectly labeled the type of feedback they received. The remaining 71 players comprised the final sample and were used in all subsequent analyses: 39 (54.9%) received mastery-oriented feedback and 32 (45.1%) received ego-oriented feedback.

With the 71 remaining participants we used for the data analysis in this study, I first examined the data distribution normality factors (i.e., skewness, kurtosis, outliers) and all outcome variables were found to be within normal limits. SPSS Version 23.0 was utilized to conduct the data analyses for this study. To address the primary research questions, analysis of covariance (ANCOVA) was used with feedback provided (growth/mastery vs. fixed/ego) as the independent variable, Time 1 score as the covariate, and Time 2 scores on task performance, task difficulty, somatic anxiety, cognitive anxiety, and state confidence as the outcomes that were tested separately. Alpha was set at .05 for all analyses.
CHAPTER 3

RESULTS

Task Performance

After controlling for Trial 1 performance ($F(1, 68) = 4.16, p = .045$, partial $\eta^2 = .058$), there was a significant effect of feedback on the athletes’ task performance on Trial 2, $F(1, 68) = 6.13, p = .016$, partial $\eta^2 = .083$. On Trial 1, the task performance scores for the participants randomly assigned to the mastery-oriented feedback group (score = 82.63) and those randomly assigned to the ego-oriented feedback group (score = 81.27) were comparable. However, after receiving the feedback, the task/growth-oriented soccer players performed significantly better on Trial 2 (score = 93.35; mean increase in points from Trial 1 to Trial 2 was 10.72; standard error = 4.07) than those in the ego/fixed-oriented condition (score = 78.35; mean decrease in points from Trial 1 to Trial 2 was 2.92; standard error = 4.49) (see Table 1).

Task Difficulty Selection

After controlling for Trial 1 task difficulty selection ($F(1, 68) = 11.33, p = .001$, partial $\eta^2 = .143$), there was a non-significant effect of feedback on the athletes’ Trial 2 score, $F(1, 68) = 1.46, p = .232$, partial $\eta^2 = .021$ (see Table 1).

Competitive State Anxiety

After controlling for Trial 1 competitive somatic anxiety ($F(1, 68) = 22.09, p < .001$, partial $\eta^2 = .245$), there was a non-significant effect of feedback on the athletes’ somatic anxiety on Trial 2, $F(1, 68) = 0.46, p = .498$, partial $\eta^2 = .007$. For cognitive anxiety, after controlling for Trial 1 scores ($F(1, 68) = 58.16, p < .001$, partial $\eta^2 = .461$), there again was a non-significant effect of feedback on the athletes’ Trial 2 scores, $F(1, 68) = 0.54, p = .466$, partial $\eta^2 = .008$. (see Table 1).
State Confidence

After controlling for Trial 1 state confidence ($F(1, 68) = 43.19, \ p < .001, \ \text{partial } \eta^2 = .388$), the effect of feedback on the athletes’ state confidence on Trial 2 was nonsignificant, $F(1, 68) = 0.29, \ p = .590, \ \text{partial } \eta^2 = .004$. (see Table 1).
CHAPTER 4

DISCUSSION

Stein et al. (2012) found coaches’ feedback has the power to influence an athlete’s perceived motivational climate and therefore it is important to understand how feedback influences athlete performance and other psychological outcomes. Within an academic setting, mastery-oriented feedback has led to increased performance, more difficult task selection, greater persistence on impossible tasks, higher levels of grit, and increased enjoyment on tasks (Mueller & Dweck, 1998) and future mastery acquisition of subtraction skills, greater skill development, and higher self-efficacy (Schunk, 1982). Within an athletic setting, mastery-oriented feedback has led to significant increases in perceived mastery-oriented motivational climates and task-involvement and to significant decreases in perceived ego-oriented motivational climates and ego-involvement (Gershgoren et al., 2011). Although there are findings related to the influence of feedback on performance and other psychological variables within an academic setting, there is no such data available within an athletic setting. This study aimed to provide that data.

The primary objective of this study was to determine the effect mastery- and ego-oriented feedback had on athlete performance on a soccer kicking task. Also, the effect of mastery- and ego-oriented feedback was measured on athlete task difficulty selection, competitive cognitive and somatic state anxiety, and competitive state confidence. This study, modeled from the Mueller and Dweck (1998) academic setting-based study, extends the human performance literature by examining how feedback influences athlete performance. Task performance scores in the present study showed athletes performed significantly higher on a soccer kicking task after receiving mastery-oriented feedback in comparison to receiving ego-oriented feedback. No task
difficulty selection, competitive cognitive state anxiety, competitive somatic state anxiety, or state confidence differences were observed.

Consistent with previous research (Mueller & Dweck, 1998), feedback was found to have a significant effect on human performance after controlling for Trial 1 performance score. Players receiving mastery-oriented feedback performed significantly better on a soccer kicking task compared to players receiving ego-oriented feedback. Athletes receiving mastery-oriented feedback experienced an 11.48% increase in performance, whereas athletes receiving ego-oriented performance experienced a 3.59% decrease in performance. There was a 15.07% performance gap between athletes receiving mastery-oriented feedback and ego-oriented feedback the second time they completed the task, whereas there was only a 1.65% difference in performance the first time they completed the task. Finding consistently different soccer task performance scores between athletes receiving mastery- and ego-feedback indicates feedback is a critical factor influencing athletic performance.

This finding has significant practical applications for coaches or other social agents responsible for setting the motivational climate for athletes within sport. It appears that even one phrase (“You must be a really hard working soccer player.”) of mastery-oriented feedback (in the absence of ego-oriented feedback) can influence an athlete to perform over 11% better the next time an athletic skill is executed. Therefore, it is recommended coaches or other social agents responsible for setting the athletic motivational climate consider giving mastery-oriented feedback to athletes who are learning skills to help them increase their subsequent performances.

It also appears that one phrase (“You must be a naturally talented soccer player.”) of ego-oriented feedback (in the absence of mastery-oriented feedback) will likely have no effect on an athlete’s subsequent skill performance or may impair an athlete’s subsequent skill performance (under 4%). Therefore, giving ego-oriented feedback to athletes who are learning skills or
performing in other capacities may result in decreased subsequent performance of the skill. At best, on average, the ego-oriented feedback may not have any effect on subsequent skill performance. Given athletes receiving ego-oriented feedback experienced decreased skill performance after hearing ego-oriented feedback, coaches and other social agents responsible for setting the motivational climate should be wary of using such feedback.

Given the study’s findings that merely one phrase of mastery- or ego-oriented feedback can influence athlete performance, repeated utilization of that type of feedback could have compounding positive or negative effects on athlete performance over time. Athletes typically hear much feedback over the course of their seasons so it is important to consider how this feedback influences their perceived motivational climates and performances.

There was no difference in the task difficulty selection on a soccer task between athletes receiving mastery- or ego-oriented feedback. Therefore, one phrase of feedback did not seem to significantly affect an athlete’s willingness to approach a more difficult level of the task. Many participants ended up taking the same strategy on Trial 2 as they did onTrial 1, irrespective of the feedback they received. There may have been no difference on athletes’ task difficulty selection due to their confidence in their initial Trial 1 strategy. Given the complexity of the task point scoring system, it is not surprising many of the athletes did not change their strategy on the soccer kicking task as this would have required a potential lengthy and undue evaluation of how to maximize the points they could score. Many athletes may have just been acting from a self-referenced perspective by competing against themselves and trying to beat their own Trial 1 score by making kick attempts toward the same goals on Trial 1 and Trial 2.

Confidence and anxiety are two psychological variables that have been shown to be predictive of sport performance. Confidence (also named self-efficacy in previous literature) is an internal psychological state that has been shown to influence sport performance (Wurtele,
Anxiety is another internal psychological state that has long been thought to influence sport performance. Most researchers assume anxiety has a negative effect on performance (Eysenck et al., 2007; Kane, 1993) and mastery-oriented motivational climates can decrease experienced anxiety for athletes (Smith et al., 2007). Different models and concepts, including the IZOF model (Hanin, 2000) and self-control (Englert & Bertrams, 2012) have been proposed as concepts to introduce to athletes to help them manage performance anxiety. These models and concepts provide evidence that most researchers view performance anxiety as having an effect on athletic performance. Within the present study, no difference was found on state confidence, competitive somatic performance anxiety, or competitive cognitive anxiety for athletes after receiving mastery- or ego-oriented feedback while executing a soccer kicking task.

The athletes’ experienced somatic and competitive anxiety may not have been influenced by feedback due to their already low experienced anxieties at the start of the experiment. All athletes participating in the task were all kinesthetically warmed up prior to completing the task (practicing with their teams beforehand) and did not feel much somatic or cognitive anxiety before the beginning of the practice trial when they were first introduced to the soccer kicking task. All athletes completed a practice trial before Trial 1 and Trial 2 and thus had a good idea of what to expect during the experimental trials. There was no introduced external competition or comparison introduced directly to the athletes (prizes were randomly assigned to athletes after everyone had completed the task) so perhaps they could focus on being more self-referenced throughout the trials, mitigating fluctuations of anxiety and confidence.

This study had several limitations that should be considered. First, the experimental manipulation was only one statement of feedback and within that statement, only two words were manipulated between the mastery- and ego-orientation feedback conditions. We were only
able to measure the effect of one phrase of mastery- and ego-oriented feedback on performance, task difficulty selection, anxiety, and confidence as opposed to many feedback statements over a long period of time. Second, the anxiety and confidence data were collected through a self-report measure and thus the data may not be representative of how the athletes actually felt. There may not be an easy solution for how to handle the potential misreporting of data. Third, although this study sample is a highly racially/ethnically diverse sample of male youth soccer players on a junior varsity, varsity, or select club soccer team, it is not representative of all athletes of different gender, ages, cultural background, or skill level. Even though the soccer kicking task was novel, it comprised familiar kinesthetic components to experienced soccer players and is not representative of all learned sport skills. Fourth, the convincingness level of the feedback given to the athletes may have differed between experimenter. The experimenters presented differently to the athletes (gender, dress, physical size and stature) and delivered the feedback differently (voice inflection).

The results of the current study raise several questions including: How is athletes' performance influenced after receiving mastery- and ego-feedback over a longer period of time? At what time do the enhanced performance effects of mastery-oriented feedback become diminished? At what time do the potentially deleterious effects of ego-oriented feedback stop? How long does it take for an athlete to shift achievement orientation and motivation after receiving mastery- or ego-oriented feedback from a key social agent? What type and how much feedback has the power to influence an athlete to approach more difficult tasks? How much does feedback influence confidence and anxiety when delivered over an extended period of time? It is recommended the field of sport psychology attempt to answer these questions to: (a) help increase the understanding of how feedback influences athlete performance, decision making and willingness to approach more difficult challenges, and internal psychological states; (b) gather
more information to educate other sport psychology professionals, coaches, and other key social agents responsible for setting the motivational climate for athletes; (c) provide practical suggestions when working with athletes to help them improve their performance and manage their confidence and anxiety levels; and (d) assist with decreasing the number of unhelpful or harmful feedback interventions utilized within the athlete motivational climate.

The current study could be replicated in the future, with females and with other athletes of different ages, skill level, and experience with soccer. The current study could also be modified to encompass a different novel sport task with different sport athletes to determine how the results extend to other sporting contexts. It could also be beneficial to devise studies aimed at determining how feedback, over an extended period of time, such as a season or over multiple seasons, influences sport performance and athlete psychological states.
Table 1

_Adjusted Means and Standard Errors for Trial 2 Outcomes After Soccer Players’ Received Either Mastery- and Ego-Oriented Feedback_

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Mastery (n = 39)</th>
<th>Ego (n = 32)</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task Performance</td>
<td>93.35 (4.07)</td>
<td>78.35 (4.49)</td>
<td>6.13*</td>
</tr>
<tr>
<td>Task Difficulty Selection</td>
<td>11.29 (0.09)</td>
<td>11.45 (0.10)</td>
<td>1.46</td>
</tr>
<tr>
<td>Somatic Anxiety</td>
<td>1.94 (0.15)</td>
<td>1.79 (0.16)</td>
<td>0.46</td>
</tr>
<tr>
<td>Cognitive Anxiety</td>
<td>2.15 (0.15)</td>
<td>2.31 (0.16)</td>
<td>0.54</td>
</tr>
<tr>
<td>State Confidence</td>
<td>75.70 (1.76)</td>
<td>74.28 (1.94)</td>
<td>0.29</td>
</tr>
</tbody>
</table>

*Note. Trial 1 scores were used as the covariate for all analyses and each one was significant at p < .05. Potential scores ranged from 0 (low) to 260 (high) for Task Performance, 10 (low) to 20 (high) for Task Difficulty Selection, 0 (low) to 7 (high) on the ARS for Somatic and Cognitive Anxiety, and 0 (low) to 100 (high) on the CRS for State Confidence.  
* p < .05
APPENDIX A

QUESTIONNAIRES
DEMOGRAPHIC QUESTIONNAIRE

Please answer the following questions honestly. It is important that you answer every question. There are no right or wrong answers, so just do the best you can.

1. Gender:
   ______ Male
   ______ Female

2. Age: ______

3. Race/ethnicity:
   _____ Caucasian/White
   _____ Hispanic/Latino/Mexican American
   _____ African-American/Black
   _____ American Indian
   _____ Asian American/Pacific Islander
   _____ Other (specify:__________________________________________________)

4. Number of Years you have Participated in Organized Soccer (including this year)
   a. in high school: _______
   b. in your life: _______

5. Current Academic Status:
   ______ Freshman
   ______ Sophomore
   ______ Junior
   ______ Senior

6. Current GPA: ______

7. What is your level of participation on your high school soccer team in the past year?
   This is my first year on the varsity team ______
   This is my second year on the varsity team ______
   This is my third year on the varsity team ______
   This is my fourth year on the varsity team ______
   I don’t play on a varsity team ______

7a. If you participated on a high school soccer team in the past year, on average, how many hours did you spend in practice and competition per week? ________
8. What position do you primarily play on your high school team?
   _______ Offense/Forward/Striker
   _______ Midfield
   _______ Defense
   _______ Goalie

9. What is/was your primary playing status on your high school team?
   _______ Starter
   _______ Reserve, but play more than half a game
   _______ Reserve, but play less than half a game
   _______ Do not play

10. Have you played for a club soccer team in the past year?
    Yes _______
    No _______

10a. If yes, on average, how many hours did you spend in practice and competition per week during the season? _______

11. What position do/did you primarily play on your club team?
    _______ Offense/Forward/Striker
    _______ Midfield
    _______ Defense
    _______ Goalie
    _______ I don't play club soccer

12. What is/was your primary playing status on your club team?
    _______ Starter
    _______ Reserve, but play more than half a game
    _______ Reserve, but play less than half a game
    _______ Do not play
    _______ I do not play club soccer
ARS

**Instructions:** Thinking about the soccer task you are about to do, rate how you feel right now (circle the appropriate number to describe how you are feeling):

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>A little bit</th>
<th>Somewhat</th>
<th>Moderately so</th>
<th>Quite a bit</th>
<th>Very much so</th>
<th>Intensely so</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I feel nervous, my body feels tight and/or my stomach tense.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>2. I feel concerned about performing poorly and that others will be disappointed with my performance.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

CRS

**Instructions:** Using the scale below, please rate your degree of confidence for the soccer task by recording a number from 0 to 100 using the scale given below

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all</td>
<td>Moderately</td>
<td>Extremely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Confident</td>
<td>Confident</td>
<td>Confident</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

My current level of confidence (from 0 to 100) is: ____________ %

FB

Please place a checkmark in the box underneath the feedback you received during the task.

☐ ŦYou must be a really hard-working soccer player.Ô

☐ ŦYou must be a naturally talented soccer player.Ô
APPENDIX B

SCRIPT
Instructor: "Hi, my name is (name). We are developing a task designed to improve shooting and passing skills in high school soccer players. I will be working with you on this task today and recording your performance as we go along. The goal of this task is to score as many points as possible within a two minute time period. You score points for each of the 12 soccer balls that you kick into one of the target goals (POINT TO THE GOALS). These three goals are placed at distances of 10, 15, and 20 yards (POINT TO EACH ONE IN TURN). If you kick a ball into the goal placed 10 yards away, you will score 10 points; you will get 15 points if you kick the ball into the 15-yard goal; and you will get 20 points if you kick the ball into the 20-yard goal. As I said already, you will have 2 minutes to complete this task. You must kick each ball from within this box (point to box), just like a corner kick. You may not dribble the ball out of the box before you kick it. You are only allowed to place (and kick) one ball at a time from the box, but you may set the balls up outside of the box however you want. Your time will begin once you kick the first ball. Remember, you may kick any or all of the balls at any of the goals you want, but your overall goal for this task is to score as many points as possible with your kicks. If you finish kicking all 10 balls in under the 2-minute time limit, you will be awarded up to 20 bonus points. I will tell you your actual score after you have completed the entire task. Do you have any questions?"

(Answers questions)

Instructor: "Ok, you will now have time to take some practice kicks. Please take 4 practice kicks towards each of the 3 goals.

(Answers questions)

Instructor: "Ok, before you begin the task, I would like you to answer these three questions. Remember, as you answer these questions, think about how you are feeling right now in relation to the soccer task you are about to do. (HAND THE PLAYER A CLIP BOARD WITH THE THREE QUESTIONS ON ITÉ HE CIRCLES HIS RESPONSE TO EACH ONE. RESEARCHER GETS CLIPBOARD WHEN DONE).

(Answers questions)

Instructor: "Ok, you will now have one minute to set up the balls however you see fit outside of the box. Just remember that you can only have one soccer ball in the kicking box at a time. Once you kick the first ball towards a goal, your time on the drill will begin. Also, once you have kicked a ball, you may immediately set up and kick another if you want. The only rule is that you may only have one ball in the box at a time. When you are ready, you may begin. We will let you know when one minute is up and when you have 30 seconds left."
Script, Part 2 (after participant completes the task the first time):

Instructor: "Please give me a moment to score your performance."

(Experimental feedback given)

Instructor: "Good job, you scored really well. You must be a really hard working soccer player."

OR

Instructor: "Good job, you scored really well. You must be a naturally talented soccer player."

Instructor: "I'm now going to give you one more chance to do the shooting task. Again, your goal is to score as many points as you can within the two minutes; if you finish before the time limit you will earn up to 20 bonus points. The number of points you may earn for each goal will remain the same for this round — 10, 15, and 20 (point to each goal as you remind them of the points associated with each). Do you have any questions?"

(Answers questions)

Instructor: "Ok, before you begin the task, I would like you to answer these three questions. Again, as you answer these questions, think about how you are feeling right now in relation to the soccer task you are about to do. (HAND THE PLAYER A CLIP BOARD WITH THE THREE QUESTIONS ON IT; HE CIRCLES HIS RESPONSE TO EACH ONE. RESEARCHER GETS CLIPBOARD WHEN DONE)."

(Answers questions)

Instructor: "Ok, you will now have one minute to set up the balls however you see fit outside of the box. Just remember that you can only have one soccer ball in the kicking box at a time. Once you kick the first ball towards a goal, your time on the drill will begin. Also, once you have kicked a ball, you may immediately set up and kick another if you want. The only rule is that you may only have one ball in the box at a time. When you are ready, you may begin. We will let you know when one minute is up and when you have 30 seconds left."
Script, Part 3 (after participant completes the task the second time):

Instructor: "As I score your performance on this second round, would you please answer the questions on this sheet (HAND CLIPBOARD WITH QUESTIONS)."

(Participant answers questions)

Instructor: "Thank you for your participation. You did really well today on the task, you must be a hard working soccer player."

(Give score if player asks for it at this time.)
Queries and Response Set:

Question: How many bonus points will I score for finishing under the time limit?  
Answer: The most you can score is 20 bonus points. You will get significantly more points for kicking the balls into the goals.

Question: Do my scores roll over?  
Answer: No.

Question: How many points did I score?  
Answer: You will be told how many points you scored at the end of the experiment.

Question: Do I have to kick each ball in a certain time limit?  
Answer: No. Your task is to score as many points as you can, but you want to finish within the two minute timeframe.

Question: Can I use different feet to kick the ball?  
Answer: Yes.

Question: Does using different feet matter?  
Answer: No.

Question: Do I have to kick the balls towards any goals in particular?  
Answer: No. Your task is to score as many points as you can within the two minute timeframe.

Question: Am I allowed to move before kicking the ball?  
Answer: You are allowed to move around but you cannot dribble the ball outside of the kicking box. Remember, you may place the balls how you would like around the kicking box before the task begins.

Question: Do I have to keep the ball on the ground/in the air when I kick it?  
Answer: No.

Question: Does it matter if the ball is on the ground/in the air when I kick the next ball?  
Answer: No.

Question: How many points do the gates stand for?  
Answer: The closest goal to you is worth 10 points. The second closest goal is worth 20 points. The furthest goal is worth 30 points.

Question: Do I have to say which goal I am aiming for before I kick it?
Answer: No.

Question: How much will I be penalized for missing a kick?
Answer: You won't be penalized.

Question: Am I going to get a penalty for not kicking all 10 balls?
Answer: No.

Question: Will I get a second chance to try?
Answer: No. Your task is to score as many points as you can in this round.

Question: Will I get any practice kicks?
Answer: Yes, you will be allotted 4 practice kicks towards each goal before we begin.
APPENDIX C

PERFORMANCE SCORING SHEETS
Practice Scoring Sheet

Date: ___________________  PID: ___________________

Practice Kicks x 12  Scorer: ___________________

(Tally the appropriate results)

<table>
<thead>
<tr>
<th></th>
<th>15 yards</th>
<th>10 yards</th>
<th>20 yards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kick Success</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>X15</th>
<th>X10</th>
<th>X20</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Time = ________

Behavioral Obs: ______________________
### Trial Scoring Sheet

<table>
<thead>
<tr>
<th>Date: ____________</th>
<th>PID: ____________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trial #: 1</td>
<td>Scorer: __________________</td>
</tr>
</tbody>
</table>

(Tally the appropriate results)

<table>
<thead>
<tr>
<th>Kick Attempt</th>
<th>15 yards</th>
<th>10 yards</th>
<th>20 yards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kick Success</td>
<td></td>
<td>X15</td>
<td>X10</td>
</tr>
<tr>
<td>Total:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Time = ________  Behavioral Obs: ________________________________

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<table>
<thead>
<tr>
<th>Trial #: 2</th>
<th></th>
<th></th>
<th></th>
<th></th>
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<tbody>
<tr>
<td>Kick Attempt</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kick Success</td>
<td></td>
<td>X15</td>
<td>X10</td>
<td>X20</td>
<td>Total</td>
</tr>
<tr>
<td>Total:</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Time = ________  Behavioral Obs: ________________________________

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**Performance Outcome:**

**Points scored** = Total Goals Made Points + Time Bonus (Max 20 points)

Time Bonus = ((120 seconds - Time to Complete Task in seconds) / 10 seconds) X 5*

*Note time max bonus points (20) are achieved at 80 seconds completion time or less
REFERENCES


