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Self-Efficacy And Psychological Skills During The Amputee Soccer World Cup

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ABSTRACT

The present study explored relationships between psychological skills, self-efficacy, and performance among soccer players participating in the Amputee World Cup. Players completed the Test of Performance Strategies (Thomas, Hardy, & Nelson, 1999). One hour before competition, participants completed a two-item self-efficacy measure designed to assess confidence in attaining performance goals for each competition. Participants completed a two-item self-referenced performance measure within an hour of competition. Results indicated self-efficacy showed reciprocal relationships with performance. Several psychological skills related to self-efficacy and performance. Relaxation skills used in training and competition were associated with high self-efficacy and successful performance. Future research should investigate the effectiveness of applied sport psychology interventions designed to enhance self-efficacy through increasing the usage of psychological skills in training and competition

Introduction

It has been suggested that applied sport psychology interventions should be founded on a basis of theory and research (Hardy, Jones, & Gould, 1996; Murphy & Tammen, 1998; Lane & Terry, 2000). A great deal of research effort has concentrated on attempting to predict performance from psychological variables. Evidence showing relationships between psychological variables could be used to guide sport psychology

interventions, and it has been proposed that sport psychologists can enhance performance by enhancing psychological skills (Murphy & Tammen, 1998). The present study focuses on the relationship between rated psychological skills, self-efficacy measures, and perceptions of soccer performance among a soccer team playing at the Amputee World Cup.

One variable shown to influence performance is self-efficacy (Bandura, 1997). Self-efficacy is defined as the beliefs of confidence individuals have in their ability to execute courses of action or attain specific performance outcomes (Bandura, 1977, 1982, 1997). Efficacy expectations are proposed to influence initiating behavior, how much effort will be applied to attain an outcome, and the level of persistence applied to the task in the face of difficulties and setbacks (Bandura, 1997). Examination of self-efficacy theory suggests that efficacy expectations are associated with successful performance (Bandura, 1997; Moritz, Feltz, Fahrback, & Mack, 2000).

Variations in self-efficacy-performance relationships have been ascribed to methodological inconsistencies between studies rather than challenging theoretical assumptions (Moritz et al., 2000). The way self-efficacy is measured has been found to influence the strength of self-efficacy-performance relationships. Moritz et al. (2000) demonstrated that weaker self-efficacy-performance relationships were evident when self-efficacy was measured using general measures of confidence such as the Competitive Sport Anxiety Inventory-2 (Martens, Vealey, & Burton, Bump, & Smith, 1990), which includes items such as "I feel calm" and "I feel self-confident". Stronger self-efficacy and performance relationships are evidenced when self-efficacy measures assess the same behaviors required in delivering the actual performance (Bandura, 1997). For example, how confident are you of scoring a penalty would be an appropriate self-efficacy measure for research investigating relationships between self-efficacy and penalty taking performance. Thus, it is suggested that researchers should seek to develop self-efficacy measures specific to the research environment.

There are several possible ways sport psychologists can attempt to enhance self-efficacy. One approach is to manipulate one or more of the four principle sources proposed by Bandura (1997). Additionally, Schinke and da Costa (2001) described a process through efficacy-related information is likely to be garnered by athletes playing in major competition. Their review highlights the number of ways through which athletes can gain efficacy expectations. It should be noted that the experience of participating in major games is likely to increase knowledge of how to perform successfully in major competition, and if the individual feels he/she can cope with task demands, it should lead to increased self-efficacy. To compliment this learning process, sport psychologists encourage athletes to develop psychological skills. Sport psychologists tend to assess athlete's psychological skills as part of a needs analysis. Psychological skills are seen as the basis for developing interventions. For example, psychological skills can give an insight into how an individual will cope in competition, and thus increase self-efficacy. For example, individuals who report using relaxation skills should be able to use these skills to relax before competition. Recent research has suggested that the Test of Performance Strategies (TOPS; Thomas, Hardy, & Nelson, 1999) is the instrument of

choice. The TOPS assesses eight psychological skills used in training and eight skills used in competition. There are clear differences between training and competition and environments, and the TOPS can facilitate testing these differences.

Developing psychological skills should lead to increased self-efficacy. Psychological skills assessed by the TOPS such as imagery and self-talk could be used to enhance self-efficacy provided the images and self-talk describe favorable performance accomplishments. Other psychological skills assessed by the TOPS include controlling negative emotions and relaxation skills. Emotional control and relaxation are skills that should assist controlling negative emotions. Bandura (1997) proposed that negative emotions could undermine self-efficacy. Additional factors assessed by the TOPS might also be associated with self-efficacy. The factor described as activation, which is characterized by the ability to increase energy might be a consequence or antecedent of self-efficacy. Likewise, automaticity, characterized by an autotelic state might be a consequence or antecedent of self-efficacy. It is acknowledged that neither automaticity nor activation fit neatly into the four sources of self-efficacy proposed by Bandura (1977).

Psychological skills such as self-talk and imagery should relate with self-efficacy toward achieving performance related goals in soccer. Demonstration of links between psychological skills, self-efficacy, and performance should provide an empirical basis for applied sport psychology interventions. Further, empirically grounded interventions are preferable because they can be tested. The aim of the present study was to investigate relationships between self-efficacy and performance among a soccer team participating in the 2001 Amputee World Cup.

Method

Participants

Participants were 15 male soccer players (Age range 19-28 years) in the England team at the 2000 Amputee World Cup. Players had an average of 11 years of playing experience ($SD = 2.81$ years) of soccer. On average, players had 2.4 years ($SD = 4.84$ years) of international experience. It should be noted that the limited number of national and international teams makes it difficult to gain competitive experience. Seven players had been playing internationally for 6 years. The Amputee World Cup was for male players only.

Measures

Psychological Skills. The TOPS is a 64-item measure of psychological skills. Exploratory factor analysis indicated an eight-factor solution for competition factors and an eight-factor solution for training factors. Factors are common to training and competition except negative thinking for competition and attentional control for training. Items were rated on a 5-point scale anchored by never (1) to always (5). The four-items were summed to produce factors scores, meaning that factor score could range from 5-20.

Self-efficacy. A key principle guiding how self-efficacy was measured was to ensure concordance between efficacy expectations and performance. A difficulty in developing such a measure was that soccer performance involves a number of different skills / competencies. For example, a defender's (there are usually four defenders) goal might be to prevent the opposing team from shooting or heading towards goal. By contrast, a forward's goal might be to shoot and score goals. We addressed this difficulty by asking each player what goal they had set for each game. These were individual goals for each player rather than team goals, although goals such a scoring goals will clearly help the team. Players were encouraged to set goals in which attainability depended on their performance rather than the team's performance. Examples of goals set included 'to play to my ability', 'to score a goal', 'to play well', 'to stay tight with defenders' and 'to give 100% effort'.

Self-efficacy was assessed asking how confident each player was in attaining this goal, and individuals set a goal for each game. A second self-efficacy question asked each player to rate his confidence in the above prediction. Self-efficacy items were rated on a nine-point scale anchored by 'Extremely unconfident' (1) and 'Extremely confident' (9).

Performance. Performance was assessed using a self-reference measure using two items, including "How do you feel about your performance in the last game?", and "To what extent did your performance relate to your pre-game expectations?" This is the same performance measure used by Lane and Chappell (2001) in a study of mood and performance relationships in basketball. Lane and Chappell (2001) reported an alpha coefficient of .87. Items were rated on a nine-point scale anchored by 'Extremely dissatisfied' (1) and 'Extremely pleased' (9). As goals were individually set, whether the team won, lost or drew games was considered of secondary performance. Alpha coefficient of internal consistency was .76, hence comparable with the alpha value reported by Lane and Chappell (2001).

Procedure

The first author, who was also the team's coach, contacted officials from the England team to gain permission to assess players in the team. As testing involved some disruption to the players normal preparation routines, permission was needed. On gaining permission from officials, players were asked to participate in the study. Players were informed of the purpose of the research. Informed consent was obtained. Players could either use their name or an identification number. It should be noted that physiological and psychological assessment of players had been done before, and thus players were aware of what was involved. Players were informed that assessments were not being used for selection purposes. As the coach was doing a dual role of coach and researcher, some explanation is warranted. A key issue is whether having a dual role has altered the data. Previous research has involved the members from the support team also collecting data for research purposes (Terry, 1993; 1994; 1995a; 1995b). Terry (1995a) outlines ways in which psychological data should be gathered to reduce the likelihood of participants reporting false responses. He emphasized the importance of informing players that

psychological data would not be used for selection purposes. In the present study, the coach did not select the team. The team did not have a sport psychologist as part of the support team. An acknowledged limitation of self-efficacy measures is leniency and bias. In the present study, it is not the absolute self-efficacy scores that are important, but how they vary in relation to psychological skills scores and performance.

The TOPS (Thomas et al., 1999) was completed by players at least three days before the first game. Self-efficacy was assessed approximately 1 hour before competition. Self-rated performance was assessed within 1 hour after the competition.

Results

The team played six games. Descriptive statistics for self-efficacy, performance, and TOPS scores are contained in Table 1. As Table 1 indicates, self-efficacy scores tended to be stable ranging from 13.33 to 13.73 ($F_{5,70} = 1.90, p > .05, \text{Eta-squared} = .11$). There was a greater range in performance scores although these did not differ significantly ($F_{5,70} = 2.14, p = .07, \text{Eta-Squared} = .13$). Players reported significantly higher scores on competition factors than training factors for emotional control ($t = 5.05, p < .001$), goal setting ($t = 3.01, p < .01$), relaxation ($t = 6.41, p < .001$), and activation ($t = 4.41, p < .01$). This finding is consistent with differences between training and competition psychological skills reported by Thomas et al. (1999).

Table 1

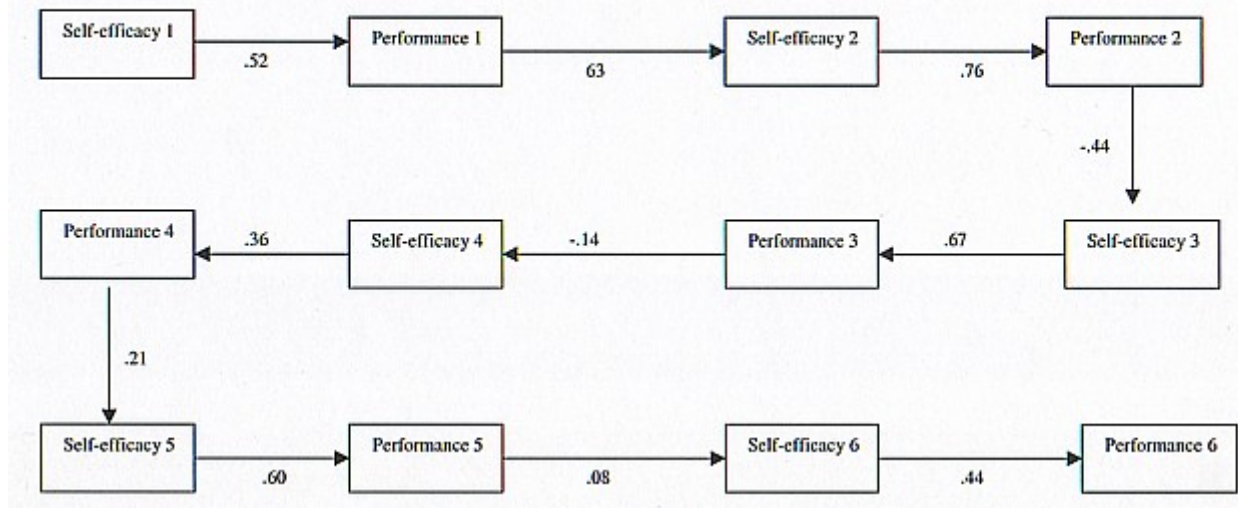
Descriptive statistics for self-efficacy and Test of Performance Strategies Scores

	<i>N</i>	<i>M</i>	<i>SD</i>
Self-efficacy 1	15	13.33	2.06
Performance 1	15	10.67	3.64
Self-efficacy 2	15	13.73	2.40
Performance 2	15	12.73	4.23
Self-efficacy 3	15	13.60	2.87
Performance 3	15	13.00	3.14
Self-efficacy 4	15	13.13	2.00
Performance 4	15	13.20	2.15
Self-efficacy 5	15	14.13	2.64
Performance 5	15	13.40	2.39
Self-efficacy 6	15	15.27	1.62
Performance 6	15	13.53	2.07
Competition Self-Talk	15	11.53	3.29
Competition Emotional Control	15	9.47	2.83
Competition Automaticity	15	11.33	3.41
Competition Goal-Setting	15	15.60	3.68
Competition Imagery	15	13.33	3.33
Competition Activation	15	14.47	3.09
Competition Negative Thinking	15	11.00	2.33
Competition Relaxation	15	12.47	1.89
Training Goal-Setting	15	12.67	1.91
Training Emotional Control	15	12.40	1.68
Training Automaticity	15	12.53	2.10
Training Relaxation	15	8.00	3.14
Training Self-Talk	15	12.47	2.83
Training Imagery	15	11.47	3.80
Training Attentional Control	15	12.47	1.36
Training Activation	15	9.67	2.02

We examined self-efficacy and performance relationships on a game-by-game basis (see Figure 1). Results indicated that self-efficacy showed moderate correlation for each competition other than game 5. Performance showed moderate relationships with

subsequent self-efficacy measures, although the relationship was weak following game 3 and game 5.

Figure 1
Correlations for self-efficacy and performance relationships



We combined self-efficacy and performance into single measures and investigated relationships between self-efficacy scores and performance, self-efficacy and TOPS scores, and TOPS scores and performance. Correlation results for self-efficacy and performance relationships indicated a significant association ($r = .57, p < .01$). This finding suggests that high self-efficacy scores were associated with successful performance.

Relationships between TOPS and self-efficacy, and TOPS and performance are contained in Table 2. As Table 2 indicates, competition activation, competition and training relaxation, training automaticity, and training imagery showed the strongest relationships. Competition activation showed weak to moderate relationships with self-efficacy ($r = .41$) and performance ($r = .38$). The direction of the relationship indicated that successful performance and high self-efficacy was associated with the usage of activation skills.

Table 2

Correlations between TOPS scores and Self-efficacy scores

	Combined Self-efficacy	Combined performance
Competition Activation	.41	.38
Competition Automaticity	.40	.01
Competition Emotional Control	-.13	.07
Competition Goal -Setting	.21	.28
Competition Imagery	.05	.23
Competition Negative Thinking	-.17	-.02
Competition Relaxation	.57	.35
Competition Self-Talk	.29	.10
Training Activation	.02	-.03
Training Attentional Control	.25	.61
Training Automaticity	.41	.31
Training Emotional Control	.04	.19
Training Goal Setting	.07	.33
Training Imagery	.42	.69
Training Relaxation	.38	.44
Training Self-Talk	-.11	.03

Competition relaxation related to self-efficacy ($r = .41$) and performance ($r = .35$), whereby the more players used relaxation skills in competition, the higher the self-efficacy scores, and better the performance scores. Training automaticity related to self-efficacy ($r = .41$) and training automaticity moderately related to performance ($r = .31$). High self-efficacy and successful performance was associated with the ability to perform automatically. Training imagery correlated with self-efficacy ($r = .42$) and training imagery correlated with performance ($r = .69$). Relationships indicated that using imagery was associated with high self-efficacy and successful performance. Training Relaxation correlated with self-efficacy ($r = .38$) and performance ($r = .44$), whereby using relaxation skills in training was associated with high self-efficacy and successful performance.

Discussion

The purpose of the present study was to investigate relationships between psychological skills, self-efficacy, and performance. Identification of variables that relate with performance can provide applied sport psychologists with valuable information. Psychological skills are seen as the backbone for an applied sport psychology intervention (Murphy & Tammen, 1998; Thomas et al., 1999). For example, imagery

skills can be used to enhance self-efficacy, reduce anxiety and relax. In the present study, we focused on relationships between psychological skills, self-efficacy and performance.

If sport psychologists are to try to enhance self-efficacy, measures of self-efficacy should relate with performance. Results of the present study demonstrated a moderate relationship between self-efficacy and performance. This finding is consistent with meta-analysis results of Moritz et al. (2001), and lends further support to the predictive effectiveness of self-efficacy in sport (Bandura, 1997).

Previous research has shown that self-efficacy-performance relationships to be strongest when the individual has a clear understanding of task demands (Bandura, 1997). When the task is difficult to assess, participants will struggle to give accurate estimates of confidence to perform successfully. Soccer is an open-skilled sport involving 11-players co-acting with the aim to score more goals than the opposition. In the present study, soccer players were experienced and therefore were likely to have a relatively clear understanding of the demands of playing soccer. Schinke and da Costa (2001) outlined the importance of experience of playing in major games in developing self-efficacy. However, despite knowledge of the demands of soccer, the player will not know how well the opposing team will perform. Thus, it is possible for a player to be able to accurately estimate how well he will play, but can only guess how well the opposition might play. We suggest that as the players were experienced, and had a relatively thorough knowledge of task difficulties, this might have influenced the strength of self-efficacy and performance relationships and weaker relationships might have occurred if players were inexperienced. It should be noted that findings from the present study derive from a very small sample size. Results generalize to players from one team over time, and these findings might not generalize to other teams.

Findings showing TOPS scores related to self-efficacy and performance could be used to devise sport psychology interventions. Competition activation scores related to both self-efficacy and performance. A similar finding was shown for relaxation skills, but in the case of relaxation, scores for relaxation in competition and training setting related to both performance and self-efficacy. The ability to control negative emotions through activating arousal or relaxing is consistent with theoretical proposals (Bandura, 1997). Further relationships indicated that imagery skills used in training were associated with relaxation skills used in competition and in training. A limitation of imagery usage as assessed by the TOPS is that the type of imagery is not explored. Thus, it is not known whether players used internal imagery, external imagery, or kinesthetic imagery. Thus, interventions that encourage using imagery during training and teaching athletes relaxation skills should lead to improved psychological skills, self-efficacy, and performance.

It should be noted that self-efficacy expectations are likely to developed as the competition progresses (Schinke & da Costa, 2001). Factors such as developing experience of playing in different venues, learning the strengths and weaknesses of the opposition are likely to increase efficacy expectations. Thus, psychological skills are likely to account for a relatively minor proportion of self-efficacy variance. Given the

proposals of Schinke and da Costa (2001) findings showing TOPS scores related consistently to self-efficacy findings throughout the course of the competition suggest that psychological skills strongly relate to self-efficacy.

The present study had at least two limitations that should be considered when interpreting the results. First, the small sample size makes it difficult to generalize findings from the present study to a wider audience. Using a probability value of $< .10$ and conducting multiple tests clearly increases the likelihood of finding significance when there is none. Results showing effect sizes consistent with theoretical predictions offer some support for theory and empirical evidence. However, some results are difficult to explain. For example, successful performance was associated with low self-efficacy following the second game. We suggest that this result is an anomaly. It does serve to question whether other results are equally anomalies. Future research should investigate the reproducibility of these findings to a different sample and larger sample. Research should also extend this line of investigation to other sports.

Second, the self-efficacy measure comprised only two items. From a psychometric perspective, a valid measure should assess the full range of behaviors relevant to the target construct. Attaining self-set goals will invariably mean that players would need to demonstrate competence in a number of different behaviors. Future research should involve a thorough investigation of the competencies underpinning performance in soccer. Identification of such strategies could be used to develop a valid measure of self-efficacy for use in soccer.

In conclusion, the present study explored relationships between psychological skills scores for training and competition, self-efficacy, and performance. Results show that self-efficacy showed reciprocal relationships with performance. Activation and relaxation influenced self-efficacy and performance, thus interventions to enhance performance could involve teaching soccer player relaxation skills in competition and training.

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