Psychology of Sport and Exercise 12 (2011) 434–441

Contents lists available at ScienceDirect

Psychology of Sport and Exercise

journal homepage: www.elsevier.com/locate/psychsport

Investigating the possible negative effects of self-efficacy upon golf putting performance

Stuart Beattie*, David Lief, Mark Adamoulas, Emily Oliver

Bangor University, UK

ARTICLE INFO

Article history:
Received 15 March 2010
Received in revised form
5 November 2010
Accepted 13 February 2011
Available online 22 February 2011

Keywords:
Confidence
Relationship
Reciprocal
Within
Between

ABSTRACT

Objectives: Research has challenged the nature of the reciprocal relationship between self-efficacy and performance. For example, at a within-person level of analysis, Vancouver, Thompson, and Williams (2001) found that performance accomplishments had a strong and positive influence upon subsequent efficacy beliefs; however, self-efficacy had a negative relationship with subsequent performance. The present set of experiments extends this research.
Design: Two experiments examine the reciprocal relationship between self-efficacy and learning/performance over time.
Method: Novice golfers putted across two conditions that varied in task difficulty.
Results: Across both experiments, performance had a significant, strong and positive relationship with subsequent self-efficacy and predicted (at best) 49% of efficacy variance. However, self-efficacy had a weak non-significant negative relationship with subsequent performance in Experiment 1 and in Experiment 2 and only explained (at best) 2.7% of performance variance.
Conclusion: The findings reveal that the reciprocal relationship between self-efficacy and performance may not be as strong as previously thought.

The vast majority of self-efficacy research has shown a positive relationship with performance across a wide range of disciplines such as sport (Moritz, Feltz, Fahrbach, & Mack, 2000), military (Sherer et al., 1982), organisation (Stajkovic & Luthans, 1998), health (Orbell, Johnston, Rowley, Davey, & Espley, 2001), and education (Multon, Brown, & Lent, 1991). Self-efficacy is defined as 'beliefs in one's capabilities to organise and execute courses of action required to produce given attainments' (Bandura, 1997, p. 3) and has been one of the most influential theories in social cognitive research since its inception. Self-efficacy has been shown to directly influence behaviour where individuals with high efficacy expectations will show greater goal commitment (Locke, Frederick, Lee, & Bobko, 1984), make higher goal progress (Sheldon & Kasser, 1998), show higher levels of task engagement (Walker, Greene, & Mansell, 2006), choose more difficult goals (Chase, 2001), and intensify efforts when goal accomplishments are threatened (Peake & Cervone, 1989).

Despite the overwhelming evidence that supports the positive effects of self-efficacy, criticisms of the research have recently emerged. For example, Vancouver, Thompson, and Williams (2001) stated that an overreliance upon cross-sectional correlational designs may have clouded the findings in the self-efficacy and performance relationship. As self-efficacy beliefs are strongly influenced by past mastery experiences (previous accomplishments) which in turn influence future efficacy beliefs and so on (Bandura, 1986, 1997), then this criticism has some substance. Vancouver et al. further argued the positive relation between self-efficacy and subsequent performance is likely to be derived from previous performance's influence upon subsequent self-efficacy.

Vancouver et al. state that according to control theory (Powers, 1973), creating a goal creates a goal discrepancy in which individuals are motivated to close (i.e., the distance between the present goal state and the desired state). Further, Vancouver et al. argue that high self-efficacy beliefs can bias the perception of ones goal state leading one to believe that they have reached their goal more readily than if they had low efficacy beliefs. In a series of studies set to examine the reciprocal self-efficacy and performance relationship at a within-person level of analysis over time, Vancouver et al. (2001; Vancouver, Thompson, Tischner, & Putka, 2002) used an analytical task (Mastermind) where participants had to correctly guess the formation of four coloured pegs that were hidden from view. After each guess participants were provided with feedback concerning how close they were to providing the right answer. The game ended when the participant guessed all

* Corresponding author: Stuart Beattie, Institute for the Psychology of Elite Performance, School of Sport, Health, and Exercise Sciences, Bangor University, George Building, Normal Site, Gwynedd LL57 2DG, UK. Tel.: +44 (0) 1248 382 756; fax: +44 (0) 1248 371 053.
E-mail address: s.j.beattie@bangor.ac.uk (S. Beattie).

1469-0292/$ – see front matter © 2011 Elsevier Ltd. All rights reserved.
doi:10.1016/j.psychsport.2011.02.004

four colours in the correct formation. Across all four studies reported by Vancouver et al. (2001, 2002), previous performance was positively related to subsequent self-efficacy but self-efficacy had a significant weak negative relationship with subsequent performance. That is, performance accomplishments inflated self-efficacy beliefs but that high self-efficacy beliefs increased the chances of participants' committing too early to the wrong answer on the following trial.

However, Bandura and Locke (2003) criticised Vancouver et al.'s (2001, 2002) methodology in that the use of Mastermind was not appropriate in examining self-efficacy beliefs over time as it is essentially based on guesswork. In other words, the task did not allow for a sense of personal efficacy and learning building over time as each trial is independent from the last (i.e., the answer changes with each trial). Bandura and Locke stated replication should be sought where learning could occur over time and also noted that the self-efficacy measure used by Vancouver and colleagues measured estimates of chance (i.e., "How likely are you to find a solution…") rather than perceived ability.

Recently, research has started to address Bandura and Locke's (2003) criticisms. For example, Vancouver and Kendall (2006) examined the role of self-efficacy and college exam preparation and performance over 5 consecutive exams. They found that across individuals, self-efficacy had a strong and positive relationship with performance. However, results supported their earlier findings in that previous exam performance had a strong and positive relationship with subsequent self-efficacy but that self-efficacy had a significant negative relationship with subsequent exam preparation and performance. That is, as self-efficacy increased by a grade, individuals studied 15 min less and exam performance decreased by nearly a quarter of a grade. Richard, Diefendorff, and Martin (2006) reported two studies where they also examined the relationship between self-efficacy and exam performance in 4 different multiple choice exams over a period of 16 weeks and a computer based chemical reactor simulation, in which participants attempted to control the temperature of the reactor over 6 different rounds of 20 trials. The goal of the task was to keep the temperature of the reactor at a specific level by learning the underlying relation between fuel and temperature. Again, in both studies strong positive relationships emerged between self-efficacy and performance across individuals. Furthermore, results showed a significant positive within-person relationship between performance and subsequent self-efficacy. However, they failed to fully support Vancouver et al.'s findings (or that of self-efficacy theory) in that no significant within-person relationship emerged between self-efficacy and subsequent performance over time. One possible limitation of using exam performance is that as the course material is likely to change over time, the exam is likely to change with regards to the course material. If this is the case, then efficacy beliefs are also less likely to build over time (as each exam performance may be independent from the last).

In a further study, Yeo and Neal (2006) used a computer based air traffic control lab task to assess the reciprocal relationship between self-efficacy and performance over time. Participants were asked to identify whether pairs of aircraft were on a collision course or not. The quicker participants responded the higher the score they received. However, points were deducted for incorrect responses. Results also revealed a strong positive relationship between self-efficacy and performance at the between-person level of analysis. Results also supported those of Vancouver et al. (2001, 2002) and Vancouver & Kendal (2006) where a significant negative relationship between self-efficacy and subsequent performance at the within-person level occurred. Although Yeo and Neal did not examine previous performance effects upon subsequent self-efficacy, they did find that performance and self-efficacy increased throughout practice (addressing one of Bandura & Locke's, 2003 criticisms). That being said, it appears that as in Vancouver et al.'s (2001, 2002) studies, high levels of self-efficacy may have caused participants to commit to the wrong response too early.

Importantly, there are no empirical studies that test the reciprocal relationship between self-efficacy and performance using multilevel analyses in sport. However, one influential study does test the reciprocal relationship between *collective* efficacy beliefs and performance in experience ice hockey players (Myers, Payment, & Feltz, 2004). Myers et al. found that performance from the previous game (1 day previous) and collective efficacy measured for the subsequent game (Saturday) had a combined and modest positive relationship upon subsequent performance (Saturday performance) across time (7–12 weekends). Hence showing opposite findings to that of Vancouver et al. (2001, 2002, 2006). One difference between Myers et al. study and the work of Vancouver et al. (2001, 2002) is that they examined collective efficacy (an athlete's confidence in her team to perform certain competences), rather than self-efficacy (beliefs in ones own performance abilities). This latter difference may be conceptually important as collective efficacy beliefs ignore individual self-regulatory factors (i.e., belief in one's capabilities to execute courses of action) that previous research (Richard et al., 2006; Vancouver et al., 2001, 2002, 2006; Yeo & Neal, 2006) and the present Experiments observed. That is to say, that with 'collective efficacy beliefs', performance and more importantly 'choices' are not entirely in ones own hands.

In conclusion, negative effects of self-efficacy at the within-person level of analysis have been shown across a variety of tasks. However, limitations still exist in that only the computer based chemical reactor simulation used by Richard et al. (2006) and the air traffic control task used by Yeo and Neal (2006) may be the only studies that used appropriate tasks allowing for learning, self-efficacy and performance to dynamically change over time. Furthermore, as the vast majority of research in sport has shown a positive correlation between self-efficacy and performance (see Feltz, Short, & Sullivan, 2008) then Vancouver et al.'s criticism (see above) should be further explored in this domain.

The purpose of the present paper was to address previous limitations (e.g., Bandura & Locke, 2003) and examine the reciprocal relationship between self-efficacy and performance in tasks where skill learning will occur over time. Two studies are reported that allow for skill development to occur in an easy golf putting condition and then in a more difficult putting condition that closely follow Vancouver et al.'s methodology. With regards to previous research (Bandura, 1997; Richard et al., 2006; Vancouver et al., 2001, 2002, 2006; Yeo & Neal, 2006), it was predicted that at the between-person level of analysis self-efficacy would have a strong and positive relationship (correlation) with performance. Second, with regards to within-person level of analysis it is predicted that learning (i.e., performance) will significantly increase throughout practice, as will self-efficacy beliefs (as mastery experiences increase efficacy beliefs). Third, previous performance will be a strong positive predictor of subsequent self-efficacy beliefs. Finally, we set out to determine the direction of the self-efficacy and subsequent performance relationship where competing predictions were hypothesized. With reference to self-efficacy theory a positive effect between self-efficacy and performance should occur (Bandura, 1997). With reference to Vancouver et al. (2001, 2002, 2006; Yeo & Neal, 2006) studies a negative effect should occur.

Experiment 1

Method

Participants

Fifty two adults (37 men, 14 women) volunteered to take part in the study. Participants were right handed with either no previous