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Psychological Momentum Shapes Athletes' Affordances

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Introduction

Psychological momentum (PM) in sports can be conceptualized as athletes' positive or negative dynamics in various psychological and behavioural factors when they perceive movement toward (positive PM) or away from (negative PM) a desired outcome (e.g., Den Hartigh, Gernigon, Van Yperen, Marin, & Van Geert, 2014; Gernigon, Briki, & Eykens, 2010). In line with this conceptualization, recent research revealed typical changes in athletes' psychological and behavioural states while they moved toward or away from the victory (i.e., the desired outcome). For instance, in an experimental study in which a rowing competition was simulated on ergometers, rowers' feelings of efficacy increased when approaching the victory and decreased when moving away from it. In addition, the rowers coordinated their movements, and regulated their efforts, better when moving toward the victory (Den Hartigh et al., 2014).

So far, researchers only assessed variables at the level of the athletes (e.g., changes in efficacy, coordination, and efforts) to provide insights into psychological and behavioural dynamics during positive and negative PM in sports. Here, we take a new step and propose that PM has an impact on athletes' perception-action processes, and thereby the way in which athletes connect to their environment in real-time. More specifically, we propose that athletes perceive their action possibilities in the environment (i.e., affordances) differently during positive and negative PM (cf. Witt & Riley, 2014). We tested this PM-affordances link in the context of golf. Our hypothesis was that athletes would perceive the distance from where they can successfully make a putt to be further away from the hole during positive momentum than during negative momentum.

Method

Twenty-three athletes ($M_{\text{age}} = 30.13$, $SD = 12.71$) with golf experience were recruited through the researchers' sports networks. In the first session of the experiment we determined the participants' baseline affordance for "putt-ability". Participants were asked to make some practice shots at 2 meters from the hole, after which they were asked to place the ball at the maximum distance from where a putt was makeable for them.

About 30 minutes later, participants competed against an opponent, who was actually a confederate (see Figure 1 for the research setup). The experimenter explained that the first to win 5 points would win a prize. Participants won a point when they made the putt or when their ball was closer to the hole than the opponent's ball, otherwise they lost a point. However, we applied a manipulation typically used to induce PM (e.g., Den Hartigh et al., 2014; Gernigon et al., 2010). In the positive momentum condition, participants started lagging behind with 4 points, but then came back and took a lead of 4 points. In the negative momentum condition, the scenario was the opposite. Participants could see the score on a screen in front of them, but they could *not* see the actual outcome of their putt, because they wore visual occlusion glasses that temporarily blinded their vision after hitting the ball. When being 4 points ahead (positive momentum) or behind (negative momentum), participants had to place the ball again at their maximum "putt-able" distance.

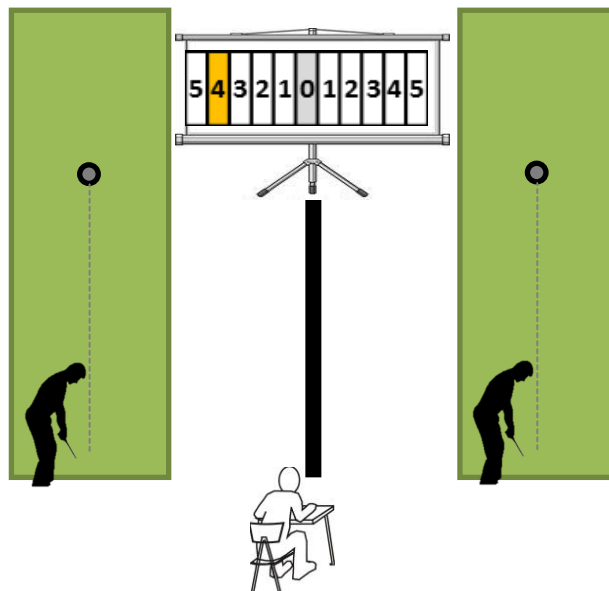


Figure 1. Research setup.

Results

We set the distance indicated in the baseline session at 100%, and determined the distance indicated after the momentum manipulation. The average distance in the positive momentum condition corresponded to 108% relative to the baseline-distance ($SD = 18\%$; 95% CI = 92% to 126%) and to 87% ($SD = 13\%$; 95% CI = 74% to 99%) in the negative momentum condition. A Monte Carlo permutation test revealed that the difference between the positive and negative momentum conditions (21%) was significant ($p = .03$), with a large effect size (Cohen's $d = 1.08$).

Discussion

This study provides first evidence for a link between PM and affordances. Our results suggest that positive and negative PM shape athletes' perception of their action possibilities. Theoretically, this combines knowledge about PM and affordances, by embedding real-time perception-action in the momentum process. For future research, it would be interesting to generalize the PM-affordances link to sports that are more dynamic than golf, including team sports (e.g., soccer, handball, rugby). Finally, from an applied perspective, coaches should become aware that the action possibilities that their athletes perceive on the field are likely dynamic and change with the momentum of the match.

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