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Decision-specific reinvestment scale: An exploration of its construct validity, and association with stress and coping appraisals

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ABSTRACT

Objective: This research project aimed to explore the construct validity of the Decision-Specific Reinvestment Scale (DSRS); more specifically, its links with stress and coping appraisals.
Design: Study 1 validated the DSRS and the Movement-Specific Reinvestment Scale (MSRS) to the French language, in order to examine the construct validity of the DSRS using the MSRS, the Preference for Intuition and Deliberation (PID) inventory and the Melbourne Decision-Making Questionnaire (MDMQ). In addition, sex differences in reinvestment were investigated. Study 2 examined stress and coping appraisals of high and low reinvesters.
Method: In study 1, 379 athletes completed the DSRS, MSRS, PID, and MDMQ. In study 2, 100 handball players, classified as low and high reinvesters, completed surveys aimed to assess stressor intensity, stressor perceived controllability, coping effectiveness, subjective performance and coping strategies with the Coping Inventory for Competitive Sport over three games.
Results: In study 1, we found that intuitive athletes scored lower on the DSRS in comparison to deliberative athletes, whilst no difference was found for the MSRS. Convergent and discriminant validity was illustrated with the subscales of the MDMQ. No sex differences were found regarding reinvestment. In study 2, findings showed that low reinvesters scored higher than high reinvesters in terms of stressor perceived controllability, coping effectiveness and subjective performance.
Discussion: In addition to confirmation of construct validity, these findings strengthen our understanding of how high decision reinvesters perceive a pressured situation. Key applications are derived from our findings informing coaches and athletes in offsetting the negative effects of reinvestment on sport performance.

Reinvestment is defined as the "manipulation of conscious, explicit, rule based knowledge, by working memory, to control the mechanics of one's movements during motor output" (Masters & Maxwell, 2004, p. 208). It is considered as a dimension of personality with the potential to influence performance under pressure (Masters, Polman, & Hammond, 1993). More specifically, the theory of reinvestment postulates that the tendency to consciously control movements online is a function of individual differences, context and a broad range of contingent events (Masters & Maxwell, 2008).

Reinvestment has been studied in a diversity of domains: In sports, a higher propensity for reinvestment has been related to poorer performance under pressure (e.g., Jackson, Ashford, & Norsworthy, 2006). This can be explained by the fact that athletes are consciously controlling skills when facing stressful situations, which makes those skills more fragile and more susceptible to disruption. Another explanation is that the explicit processes used when reinvesting under pressure consume working memory, and the reduced function of working memory then debilitates automatic processing, causing skill breakdown under pressure (Masters & Maxwell, 2004). Moreover, in medicine, reinvestment has been associated with diseases that affect motor skill performance: for example, the tendency to reinvest has been associated with the duration of Parkinson disease (Masters, Pall, MacMahon, & Eves, 2007).

Reinvestment was originally assessed using the reinvestment scale (Masters et al., 1993). Despite some supportive evidence (e.g., Masters et al., 1993; Weiss, 2011), this scale has received criticism regarding its face validity as it does not measure the process of reinvestment directly, but rather brings together similar items

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aiming to predict this process (Jackson et al., 2006). Therefore, two context specific scales were developed: the Movement-Specific Reinvestment Scale (MSRS; Masters, Eves, & Maxwell, 2005) and the Decision-Specific Reinvestment Scale (DSRS; Kinrade, Jackson, Ashford, & Bishop, 2010). The DSRS, considered to reflect a trait, contains two factors: decision reinvestment, assessing the conscious monitoring of processes involved in making a decision, and decision rumination, referring to the negative evaluation of previous poor decisions (Kinrade, Jackson, Ashford, et al., 2010). The DSRS has received evidence from both real-life situations and the lab. First, athletes scoring high on the DSRS were found to have a higher tendency to choke under pressure according to their coach based on observations of competition performance over a season (Kinrade, Jackson, Ashford, et al., 2010). Second, in the lab, referees with a higher tendency for decision rumination were found to be more influenced by the home advantage; disproportionately favouring the home team in the decisions they made (Poolton, Siu, & Masters, 2011).

Whilst these initial findings are promising, there is relatively little empirical support for its use due to its infancy as a psychometric instrument. More specifically, relatively little data is available to date for the DSRS concerning its construct and predictive validity, sex differences, or the interaction between reinvestment and perceived pressure, which is also commonly associated with skill failure under pressure (Beilock & Gray, 2007). We therefore sought to address those gaps with two studies. In study 1, we aimed to address the construct validity of the DSRS, assessing convergent and discriminant validity with other related scales, as well as sex differences. In study 2, we aimed to investigate the links between DSRS, stress and coping appraisals, and its predictive validity using subjective performance.

Study 1

In order to explore the construct validity of the DSRS, study 1 aimed to investigate the convergent and discriminant validity of the DSRS using the MSRS, the Preference for Intuition and Deliberation inventory (PID; Betsch, 2004) and the Melbourne Decision Making Questionnaire (MDMQ; Mann, Burnett, Radford, & Ford, 1997). A secondary aim was to investigate whether sex differences should be expected regarding reinvestment.

The MSRS contains two factors: conscious motor processing, which reflects the amount of conscious monitoring during movement, and movement self-consciousness, which reflects the amount of concern related to movement (Masters & Maxwell, 2008). Studies using this scale have shown that the MSRS score can predict falls in the elderly (Wong, Masters, Maxwell, & Abernethy, 2008), and was linked with the experience of stroke (Orrell, Masters, & Eves, 2009) where discriminant differences were found between stroke patients and a control sample. Additionally, the tendency to reinvest in the mechanics of motor performance, together with the time spent in rehabilitation, were significant predictors of functional impairment following stroke. Given the fact that the MSRS and the DSRS are both derived from the original reinvestment construct, convergent validity is expected between the DSRS and the MSRS.

The PID examines a trait construct that distinguishes two aspects of cognitive thinking, intuition and deliberation. According to this conceptualization, intuition and deliberation are not seen as the two opposites of one continuum, but are two independent constructs with the dependence of one over the other being state specific (Betsch, 2004). While intuitive people are expected to base their reasoning on associative, unconscious, effortless, heuristic, and suboptimal processes, deliberative people tend to do so following rule-based, conscious, effortful, analytic, and rational processes (Kruglanski & Gigerenzer, 2011). Recent studies in the lab (Raab & Laborde, 2011) and real life (i.e., academic exam; Laborde, Dosseville, & Scelles, 2010) have shown that the preference for intuition and deliberation is linked with cognitive functioning efficiency. Interestingly, these findings support a link between the PID and reinvestment: in situations where time is limited, thinking intuitively has been found to be more efficient, in terms of decision making, than thinking deliberatively (Raab & Laborde, 2011). Similarly, Kinrade, Jackson, and Ashford (2010) found that thinking too much under pressure provokes a performance breakdown both at the motor and the cognitive level. Finally, the PID enables us to discriminate people according to their propensity to engage in conscious cognitive processing, a relevant characteristic in reinvesters as conceptualized by the MSRS and the DSRS, rationalizing its use in testing the construct validity of the DSRS.

The MDMQ assesses decision-making coping patterns. This questionnaire is based upon the conflict theory of decision making (Janis & Mann, 1977) and assumes that the stress created by decisional conflict is a critical determinant of failure to achieve high quality decision making (Mann et al., 1997). The conflict theory assumes that there are different patterns of coping with the stress generated by a difficult decision, which are reflected in the subscales of the MDMQ. The French version of the MDMQ (Bailly & Ilharragorry-Devaux, 2011) contains four subscales: vigilance, hypervigilance, buck-passing and procrastination, with the last two subscales belonging to the defensive avoidance dimension. Vigilance represents the tendency of the decision maker to carefully examine all aspects of the decision before making a choice, and hypervigilance represents the tendency of the decision maker to search frantically for a way out of dilemmas, vacillating between unpleasant alternatives (Mann et al., 1997). Vigilance is the only coping pattern allowing rational decision making when there is enough time to search and deliberate before making a decision. Vigilance is therefore linked with deliberation and the manipulation of rule-based knowledge, which is consistent with reinvestment (Masters & Maxwell, 2004). Hypervigilance is a critical state concerned with thinking too much under pressure, the pressure here being created by the decision itself; and has clear conceptual links to the theory of reinvestment (Masters & Maxwell, 2008). Defensive avoidance means that the decision maker will escape the decision conflict by procrastinating or shifting responsibility to someone else, which conceptually is quite unrelated to reinvestment (Masters & Maxwell, 2008). To summarize, convergent validity will be expected between the reinvestment scales, vigilance and hypervigilance, while discriminant validity would be expected between buck-passing and procrastination.

Sex differences were not included in the original developments of either scale. Whilst theoretically there is no reason to expect that men and women differ in their tendency to reinvest (Masters & Maxwell, 2008), it seems warranted to clarify this issue which might have an influence on the appropriateness of factor structure of the scales, and norm development and interpretation.

In exploring the convergent and discriminant validity of the DSRS with the MSRS, the PID and the Melbourne Decision Making questionnaire, we predict that intuitive decision makers will score lower on the DSRS and MSRS in comparison to deliberative decision makers, and that the effect size will be higher for DSRS due to a closer conceptual link (Plessner, Betsch, & Betsch, 2008). Second, we hypothesize that positive correlations will be found between the reinvestment scales and the vigilance and hypervigilance subscales of the MDMQ, while no correlations are expected with the buck-passing and procrastination subscales. Finally, regarding sex differences we hypothesize factor invariance and no score differences between men and women on both the DSRS and MSRS.