



The effects of an imagery intervention on implicit and explicit exercise attitudes



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ABSTRACT

Objectives: This study examined the effects of exercise imagery on implicit and explicit attitudes towards exercise and the moderating effect of exercise status. It was predicted that exercise imagery would activate a pattern of positive automatic associations with exercise that would be reflected in more positive implicit attitudes. Corresponding effects were expected for explicit affective attitudes, but imagery was not expected to influence explicit instrumental attitudes.

Design: A post-test only comparison group design.

Method: Participants ($N = 160$; 40 male and 40 female frequent exercisers, 40 male and 40 female less frequent exercisers) were randomly allocated, stratified by exercise status and gender, to undergo either guided imagery of a pleasant experience of exercising or a comparison imagery condition. Participants then completed an Implicit Association Test, measures of explicit affective and instrumental attitudes, and an imagery manipulation check.

Results: There were significant main effects for experimental condition and exercise status on implicit attitudes, with more positive attitudes in the exercise imagery condition and for more frequent exercisers. There were significant main effects for exercise status on explicit affective and instrumental attitudes. Exercise status did not moderate the effects of imagery on implicit or explicit attitudes.

Conclusion: This is the first study to demonstrate that implicit attitudes to exercise can be modified, although only immediate effects were assessed. Future research should assess the generalisability of the findings in less active populations and examine the effects of repeated imagery on implicit attitudes to determine whether it could have more lasting effects and impact on actual exercise behaviour.

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Introduction

Understanding the determinants of exercise adoption and maintenance is a major focus of research in exercise and health psychology. The study of attitudes towards physical activity has been prominent in this research (Hagger, Chatzisarantis, & Biddle, 2002). The majority of this research has been framed within the context of value-expectancy models such as the theory of planned behaviour (Ajzen, 1985) which posit that attitudes are determined by conscious, deliberative consideration of the benefits and costs associated with engaging in a behaviour and the personal value placed upon the outcomes of the behaviour. Advances in social cognition, however, have highlighted the importance of automatic or non-conscious cognitive processes in determining behaviour. A

number of dual-process models of social cognition have been elaborated (e.g., Bargh & Chartrand, 1999; Fazio, 1990; Gawronski & Bodenhausen, 2006; Strack & Deutsch, 2004; Wilson, Lindsey, & Schooler, 2000). The common feature of these models is the proposition that both explicit (consciously controlled) and implicit (automatically activated) cognitive processes, including attitudinal, self-concept, and motivational processes, can play a role in determining behaviour. Explicit processes are those that are rational and deliberative, effortfully initiated, accessible to awareness, and can be assessed by self-report measures. Implicit processes are automatically activated in response to contextual stimuli and are not deliberately initiated or controlled by the individual. The extent to which implicit cognitions are accessible to consciousness is a matter of some debate (Payne & Gawronski, 2010), but there is a general agreement in the field of implicit social cognition that they are at best not readily amenable to accurate introspection, and so they cannot easily be assessed directly by self-report. Instead,

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implicit cognitions are typically measured indirectly using response latency paradigms. For example, the widely used Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998) is used to infer implicit attitudes by measuring the strengths of associations between target concepts and valence attributes through the speed with which individuals respond to pairings of concept exemplars and positive and negative attributes.

There is a relative paucity of research on the role of implicit cognitive processes in physical activity. However, there are theoretical reasons to expect that implicit cognitive processes are involved in physical activity (Dimmock & Banting, 2009) and the limited available empirical evidence does suggest that implicit cognitions are related to exercise behaviour. Eves, Scott, Hoppé, and French (2007) and Calitri, Lowe, Eves, and Bennett (2009) found that higher levels of physical activity were associated with positive implicit attitudes to exercise. Banting, Dimmock, and Lay (2009) found that implicit and explicit exercise schema explained similar amounts of variance in exercise behaviour. Conroy, Hyde, Doerksen, and Ribeiro (2010) found that implicit attitudes to physical activity prospectively predicted physical activity behaviours, objectively assessed by pedometer, after controlling for explicit motivational variables. Studies have also shown that implicit cognitions are associated with exercise-related cognitive and attentional processes. For example, Harju and Reed (2003) found that implicit exercise attitudes are associated with the importance placed on being an exerciser and avoiding being a non-exerciser. Similarly, Berry, Spence, and Clark (2011) found that exercise schematics (individuals who explicitly identify themselves as exercisers) had a stronger positive implicit bias toward exercisers than non-schematics. Scott, Eves, Hoppé, and French (2009) found that among regular exercisers, positive implicit beliefs about physical activity outcomes were more accessible than control outcomes. Finally, Calitri et al. (2009) found that implicit but not explicit exercise attitudes were associated with an automatic attentional bias towards exercise cues.

An important issue regarding implicit cognitions is the extent to which they are modifiable. Implicit attitudes are considered to reflect associations in memory that develop over time with repeated exposure to specific experiences. Consequently, it has been thought that they are relatively resistant to change through explicit interventions or verbal cues (Bargh, 1994). However, a number of studies have now shown that implicit cognitions can be modified, even by brief interventions, at least in the short term. Of particular relevance to the current study, across five studies Blair, Ma, and Lenton (2001) weakened implicit gender stereotypes by having participants engage in a brief counterstereotypic mental imagery exercise in which they were asked to imagine a strong woman. The authors argued that mental imagery, even though it is intentional and controlled, can moderate implicit processes because it increases the accessibility of related cognitive, emotional, and behavioural representations in memory. Thus, imagining a strong woman activated pre-existing but normally less accessible memories of actual strong women and their related positive attributes, leading to an attenuation of typical implicit gender stereotyping. Blair et al. (2001) suggested that imagery may be a particularly powerful method of influencing implicit cognitions because of the similarity of imaged experience to actual perceptual experience.

Gawronski and Bodenhausen's (2006) associative and propositional evaluation (APE) model offers a further theoretical rationale for the potential for imagery to modify implicit attitudes. According to this model, implicit and explicit attitude measures reflect two distinct forms of evaluative processes: associative and propositional processes. Associative processes are defined as the momentary activation of patterns of association in memory. Propositional processes are defined as the conscious validation (the subjective

truth or accuracy) of momentarily activated patterns of association. Contextual cues can activate different subsets of patterns of automatic associations from the available associations in memory. Thus, a contextual factor, such as engaging in imagery of an attitude object, could be manipulated to elicit positive (or indeed negative) automatic evaluations of the object, provided that there are pre-existing positive (or negative) associations in memory. Such changes in pattern activation can lead to rapid changes in implicit attitude measures (Rydell & McConnell, 2010). Indeed, according to the APE model, positive associative evaluations can be activated regardless of whether a person consciously endorses these evaluations (Gawronski & Bodenhausen, 2006). In support of this, Foroni and Mayr (2005) reversed the classic flowers/insects IAT effect (the ubiquitous implicit preference for flowers over insects) by presenting participants with a short written scenario describing a post-apocalyptic world in which flowers have become noxious to humans whereas insects have become a crucial source of food.

The APE model also specifies conditions under which contextual manipulations will modify responses to implicit but not explicit measures, explicit but not implicit measures, or both (Gawronski & Bodenhausen, 2006). Because the activation of associative processes is independent of their subjective validation, an intervention like imagery of a pleasant experience of exercise might temporarily activate a pattern of positive automatic evaluative associations with exercise, which would be reflected in positive responses to an implicit measure of attitudes. Momentarily activated automatic associations typically serve as the basis for explicit evaluations (Gawronski & Sritharan, 2010). However, when motivated to consciously consider one's attitudes (e.g., by completing a self-report measure), these automatically activated associations may be rejected if they are inconsistent with other considered information, resulting in a lack of impact on an explicit measure of attitudes. Dasgupta and Greenwald (2001) found such a dissociation in two studies examining racial and age-related attitudes. Presentation of visual images of well-known admired exemplars of black and older people modified implicit attitudes, assessed by an IAT, but had no influence on explicit attitudes.

The likelihood of a dissociation between implicit and explicit measures depends, in part, on the degree of cognitive elaboration in the propositional evaluation of an attitude object (Hofmann, Gschwendner, Nosek, & Schmitt, 2005). Thus the method of assessing explicit attitudes could influence the correspondence between implicit and explicit attitudes. Implicit measures have been characterised as reflecting affective rather than cognitive components of attitudes (Hofmann, Gschwendner, et al., 2005) and greater consistency has been observed between explicit measures and IAT scores when the explicit measures assess affective rather than cognitive responses (Hofmann, Gawronski, Gschwendner, Le, & Schmidt, 2005). Thus, a manipulation that influences implicit attitude scores may also influence responses to an affective explicit attitude measure but not a cognitive explicit measure requiring greater cognitive elaboration, such as an evaluation of the instrumental value of the attitude object.

The aim of the current study was to examine the effects of guided imagery on implicit and explicit attitudes to exercise. Based on the idea that engaging in a mental imagery exercise focused on imagining a pleasant experience of exercising would activate positive automatic associations with exercise, we hypothesised that pleasant exercise imagery would lead to a more positive implicit attitude toward exercise than a comparison imagery condition. Due to the greater consistency between affective rather than cognitive explicit attitude measures and implicit measures, we also predicted that pleasant exercise imagery would lead to more positive affective explicit attitudes to exercise but would not influence instrumental explicit attitudes.

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