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Can theory-based messages in combination with cognitive prompts promote exercise in classroom settings?

Chloe Hill, Charles Abraham*, Daniel B. Wright

Department of Psychology, University of Sussex, Falmer, Brighton BN1 9QG, UK

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Abstract

A randomised control trial evaluated the effectiveness of a theory-based persuasive leaflet designed to encourage students to undertake at least one additional physical exercise session a week. Participants were 503 secondary school students attending a school in South-East England. The leaflet was written to target potentially modifiable cognitive antecedents of exercise specified by the Theory of Planned Behaviour. It was separately augmented with two cognitive change techniques, resulting in three intervention conditions, leaflet alone; leaflet plus motivational quiz, and leaflet plus implementation intention prompt, as well as a no-leaflet control condition. Cognitions and behaviour were measured immediately before and 3 weeks after intervention. The results showed that all three-leaflet interventions significantly increased reported exercise, intention to exercise and related cognitions, compared to the control condition, but did not differ in their impact. Mediation analysis showed that intervention effects on exercise were partially mediated by intentions and perceived behavioural control.

Keywords: Exercise; Health promotion; Theory of planned behaviour; Elaboration likelihood model; Implementation intentions; Adolescents; Randomised controlled trial

Introduction

Regular exercise is associated with lower levels of cardiovascular damage throughout the lifespan (Bouchard & Depres, 1995; Kohl, 2001). Consequently, guidelines for young people recommend 1 h of moderate exercise each day (Biddle, Sallis, & Cavill, 1998; Clarkson, Munuck, & Kaplan, 1986). However, in the UK, for example, 40% of young men and 60% of young women fail to meet this standard (Department of Health, [DOH] 2004). The greatest decrease in exercise occurs during late adolescence making this a prime age for exercise enhancement interventions (Stephens, Jacobs, & White, 1985). Brief cost-effective interventions that could be widely administered, such as the provision of effective exercise promotion materials in schools, could make a particularly important contribution.

Identifying cognitive antecedents of exercise

A variety of social cognitive models specify potentially modifiable cognitive antecedents of health behaviour change (Conner & Norman, 2005; Glanz, Rimer, & Lewis, 2002). Of these, the

*Corresponding author. Tel.: +44 1273 678885.
E-mail addresses: c.hill@sussex.ac.uk (C. Hill), s.c.s.abraham@sussex.ac.uk (C. Abraham), danw@central.susx.ac.uk (D.B. Wright).

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Theory of Planned Behaviour (TPB; Ajzen, 1991, 2001) proposes that intention is the most proximal determinant of action and is, in turn, predicted by attitude, subjective norm and perceived behavioural control. Attitude represents a person's evaluation of the behaviour (e.g., will it lead to valued outcomes?). Subjective norm is the perception of others' approval of the proposed behaviour, especially those whose opinions are valued. Perceived behavioural control (PBC) refers to a person's perception of whether or not they can control performance and is closely related to Bandura's construct of self-efficacy (Bandura, 1998). Both PBC and self-efficacy are expected to bolster intentions and sustain action because people are more likely to attempt actions that are controllable and easy to perform (Armitage & Conner, 2001; Bandura, 1997).

Meta-analyses suggest that on average the theory accounts for 27% of the variance in exercise behaviour (Hagger, Chatzisarantis, & Biddle, 2002; Hausenblas, Carron, & Mack, 1997). Yet few experimental tests of the theory have been reported. A systematic review found that only 12 studies had used TPB constructs to develop behaviour change intervention components (Hardeman et al., 2002). Even these were often based on selected TPB components and did not usually tests for mediation of intervention effectiveness by predicted cognition change. Three exercise interventions were identified (Courneya & McAuley, 1995; Estabrooks & Carron, 1998; Rodgers & Brawley, 1993), but behaviour change was not a measured outcome. Consequently few studies have examined behaviour change mediated by cognitions related to the TPB.

Motivation, cognitive response and persuasion

Studies of belief and attitude change have tested a variety of persuasive techniques. For example, the Elaboration Likelihood Model (ELM; Petty & Cacioppo, 1986) proposes that elaborated or systematic processing is more likely when people have sufficient time and motivation to consider persuasive messages. Strong arguments presented under these conditions are likely to elicit favourable cognitive responses and attitude change (e.g., Chatzisarantis & Hagger, 2005; Jones, Sinclair, & Courneya, 2003).

To date however, few studies have examined the impact of extrinsic motivational incentives on attitude or behaviour change. In a three-condition experiment, Krahé, Abraham, and Scheinberger-Olwig (2004) compared a no-leaflet control condition with (1) a publicly available leaflet found to target cognitions associated with condom use (including self-efficacy and attitudes) and (2) the same leaflet supplemented by a quiz on leaflet contents with a prize draw for correctly completed quiz entries. Krahé et al. found that the leaflet alone was no more effective than the no-leaflet control condition but, in combination with the quiz and incentive to win a prize, the leaflet generated significantly higher pro-condom cognitions at follow up.

Implementation intentions

Intention does not always lead to action but the formation of implementation intentions (Gollwitzer, 1993, 1999) has been found to make enactment of intentions more likely. By specifying the context in which a behaviour will be performed implementation, intentions create a link between cues from a particular context and action. For example, whereas an intention might take the form 'I intend to exercise for one hour a week,' the corresponding implementation intention might be 'Every Monday I will stay after school and play football for at least an hour.' Milne, Orbell, and Sheeran (2002) found that a text-based intervention based on Protection Motivation Theory (PMT) prompted positive pro-exercise cognition change but did not increase exercise. However, when this intervention was combined with an implementation intention prompt, greater behaviour change was observed (see Gollwitzer & Sheeran, 2006 for a meta-analysis of such studies).

The present study

The present study evaluated a leaflet designed to encourage increased exercise amongst a youth sample using persuasive text to change attitudes, norms and behaviour control. The leaflet (L) was assessed in relation to self-reported change in the number of 30-min exercise sessions undertaken over 3 weeks and in relation to changes in cognitive mediators of behaviour change. The leaflet was presented on its own and in combination with one of two cognitive prompts. First, based on the Elaboration Likelihood Model, an incentive to read the leaflet and complete a quiz was added (LQ condition). Second, an implementation intention