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Changes in implicit and explicit exercise-related attitudes after reading targeted exercise-related information☆

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ABSTRACT

The purpose of this research was to examine if reading exercise information targeted at pretest explicit attitudes were related to changes in corresponding implicit or explicit attitudes. The associative-propositional evaluation (APE) model guided the research. Participants ($N = 154$) completed pretest measures of implicit and explicit attitudes; one week later they read information that targeted pretest explicit affective or instrumental attitudes and again completed the attitude measures. Results showed changes in implicit attitudes in both instrumental message conditions that supported the hypotheses that counter-attitudinal information would result in implicit attitude change in the opposite direction to the reading whereas information that targeted congruent attitudes would show changes in keeping with the information. This study demonstrates the importance of considering how implicit cognitions may change as a result of reading exercise-related information, and the relationship between implicit and explicit attitudes.

Attitudes are evaluations of ideas, objects, or behaviors, which indicate likes, dislikes, or feelings in relation to the evaluated item (Bohner & Dickel, 2011; Petty & Brinol, 2010). They are an important construct in many models of health behavior because of their relationship to behavioral intention and uptake (e.g., theory of planned behavior; Ajzen, 1985). In the exercise domain, attitudes have been conceptualized as affective (e.g., fun) or instrumental (e.g., healthy; Rhodes, Blanchard, & Matheson, 2006). For example, a person may believe in the health benefits of exercise (an instrumental attitude) but nonetheless find exercise unpleasant (an affective attitude).

In recent years, researchers have begun to understand the importance of examining not only explicit attitudes, which have received the vast majority of research attention, but also examining implicit attitudes and their possible relationship to health behavior (Sheeran, Gollwitzer, & Bargh, 2013). Implicit and explicit attitudes are included in dual-processing models which consider cognitive processes that are slow and deliberative and rely on reasoning about the relationships between objects (i.e., explicit attitudes) and processes that are fast and non-deliberative and arise from automatically activated associations (i.e., implicit processes) (c.f. Evans, 2008). For example, the associative-propositional evaluation (APE) model proposes that attitudes can be represented implicitly as automatically activated affective associative pathways and explicitly as expressions of attitude that are based on propositional beliefs (Gawronski & Bodenhausen, 2006, 2011). As conceptualized by the APE model, implicit attitudes reflect associations in memory and are the result of the interaction between pre-existing associations and current external inputs (e.g., a message). Explicit attitudes reflect reasoning about the validity of automatically activated associations. Accordingly, it is conceivable that one may have an automatic negative association of exercise as unpleasant (an implicit affective attitude), but upon being persuaded that exercising with friends may be fun, endorse exercise positively on a questionnaire (an explicit affective attitude). Greater understanding of the interplay between implicit and explicit exercise-related attitudes is necessary because implicit attitudes may be related to intentions to be active (Berry, Jones, McLeod, & Spence, 2011) and explain variance in exercise behavior beyond that explained by explicit cognitions (Conroy, Hyde, Doerksen, & Ribeiro, 2010).

One important question is how implicit and explicit exercise-related attitudes might be affected as a result of reading an exercise-related message. The APE model proposes various ways in which implicit attitudes might be affected including through

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changes in associative structure brought about by evaluative conditioning, or a change in pattern activation that occurs when a context cue influences activation of associations for something that is already familiar (Gawronski & Bodenhausen, 2006). It is the activation of associations that is of interest in the present research because exercise is likely associated with multiple outcomes that can be instrumental (e.g., health or injury) or affective (e.g., fun or boring). These associations may be created by exposure to various sources (e.g., media, public health units, fitness magazines) and personal experience. For example, when someone is given information about exercise from a doctor, associations between exercise and health may be activated which would be reflected as a positive attitude on an implicit attitudes measure. However, if information is counter-attitudinal, it is possible that implicit attitudes will show an ironic effect. This means activated implicit attitudes will be opposite to the information presented because the old association was not rejected; rather, the original evaluation was further activated. Such ironic effects are thought to occur because negating a proposition at an explicit level may result in simultaneously activating related concepts at the associative level (Jones, Kirkland, & Cunningham, 2015). For example, processing information about how exercise might cause injury may automatically activate associations of exercise with health. Importantly, different cues about the same attitude concept (e.g., exercise) can influence which associative pattern is activated resulting in different attitudes toward the same object.

Explicit attitudes may be influenced through a change in associative evaluation, through change in the set of propositions that need to be evaluated (because of new information or through additional consideration of propositions that are already known), or through a change in strategy used to achieve consistency about a set of propositions. Gawronski and Bodenhausen (2006) argue that persuasive material can affect explicit attitudes likely because new information changes propositions to be evaluated. For example, being given information about exercise from a doctor may give rise to the automatic association of exercise as beneficial, which is then considered to be 'true' at an explicit level. Relatively little research has examined the relationship between exercise-related implicit and explicit attitudes although there is some evidence they are independent (Hyde, Doerksen, Ribeiro, & Conroy, 2010). Research is needed to further understand how implicit and explicit attitudes are related and how they may be affected through reading information about exercise. The current research examined how attitudes may be affected when presented with information that is counter-attitudinal or targets congruent but not maximal attitudes. This allows for testing of whether attitudes can be changed (in the case of counter-attitudinal information) or strengthened (in the case of information targeting congruent attitudes).

Specifically, the purpose of this research was to examine how reading exercise-related information targeted at pretest explicit attitudes was related to corresponding implicit or explicit attitudes. Pretest explicit attitudes were targeted because according to the APE model, if a message includes information that is counter to the original evaluation, propositional reasoning is engaged such that propositional processes are affected. It is less likely that implicit attitudes will be affected but any associative evaluations should be opposite to counter-attitudinal information such that a negative message should result in more positive implicit attitudes and vice versa for a positive message (Gawronski & Bodenhausen, 2006). Thus, in order to test our first hypothesis, we targeted pretest explicit attitudes to examine if the possible negation of the propositions contained within the messages was associated with corresponding ironic effects at the implicit level. Given the paucity of research examining these questions, the following exploratory hypotheses are made:

H1. Counter-attitudinal exercise-related information is expected to have an influence on explicit attitudes primarily such that explicit attitudes will correspond with the message and implicit associations will be in the direction opposite to the message given (i.e., an ironic effect).

H2. If the information targets congruent positive attitudes, implicit associations should be in the direction of the information because the already existing associations are activated and likely to be affirmed at an explicit level. Thus, it is hypothesized that information that is not counter-attitudinal but is given to participants with congruent attitudes will result in explicit and implicit attitudes that are consistent with the direction of the message.

1. Method

1.1. Participants

Participants ($N = 155$) were recruited from a first year psychology class in which students receive course credit for study participation (or can choose to do an alternative learning opportunity). The average age was 19.4 ($SD = 1.96$) years and 69.7% were female.

1.2. Measures

1.2.1. Implicit attitudes

Participants completed two versions of the go/no go association task (GNAT; Nosek & Banaji, 2001). In both tasks, the target category was exercise but the evaluative attributes differed between them such that for the evaluative dimension, which was good-bad, the words represented either affective [e.g., fun-boring, pleasant-unpleasant] or instrumental [e.g., healthy-unhealthy, fit-unfit] attitudes. In both tasks, the contrast target category was generic words (e.g., bookshelf, carpet). Participants were instructed to categorize words that belong to a target category by hitting the space bar (go) as fast as they can, or to ignore the word if it does not belong to the category (no go). A fixation cross was shown for 500 ms (msec) preceding each trial and the response deadline for categorizing targets was 850 msec because response time (RT) was used as the outcome measure. Thus, a longer deadline was appropriate. Feedback in the form of a red "X" when an error was made or a blue "O" for a correct response was provided after each trial. There was a short break between each block during which participants were told the target words for the upcoming block. The block order was counterbalanced so that some participants categorized exercise and good words first, others exercise and bad, and so on. The order of the affective and instrumental GNATS was also counterbalanced across participants.

Reliability was calculated using odd/even experimental trials rather than first and second half splits because implicit measures are sensitive to practice effects and learning strategies (Perugini, Richetin, & Zogmaister, 2010; Williams & Kaufmann, 2012). Reliability of both GNATs was good. There were no significant differences between odd and even trials when pairing exercise with good or bad at either pretest or posttest (all t-test $p > .11$) and the intraclass correlations ranged from .72 to .85. The response times were similar to those reported by Nosek and Banaji (2001, p. 648) even with a response deadline as short as 500 msec. This indicates participants in the current study were responding quickly.

1.2.2. Demographics

Participants self-reported their age and gender.