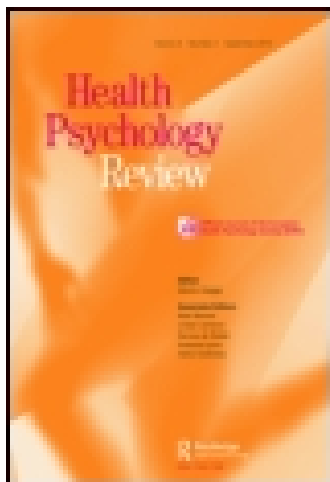


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### The confounded self-efficacy construct: conceptual analysis and recommendations for future research

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## The confounded self-efficacy construct: conceptual analysis and recommendations for future research

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Self-efficacy is central to health behaviour theories due to its robust predictive capabilities. In this paper, we present and review evidence for a self-efficacy-as-motivation argument in which standard self-efficacy questionnaires – i.e., ratings of whether participants ‘can do’ the target behaviour – reflect motivation rather than perceived capability. The potential implication is that associations between self-efficacy ratings (particularly those that employ a ‘can do’ operationalisation) and health-related behaviours simply indicate that people are likely to do what they are motivated to do. There is some empirical evidence for the self-efficacy-as-motivation argument, with three studies demonstrating causal effects of outcome expectancy on subsequent self-efficacy ratings. Three additional studies show that – consistent with the self-efficacy-as-motivation argument – controlling for motivation by adding the phrase ‘if you wanted to’ to the end of self-efficacy items decreases associations between self-efficacy ratings and motivation. Likewise, a qualitative study using a thought-listing procedure demonstrates that self-efficacy ratings have motivational antecedents. The available evidence suggests that the self-efficacy-as-motivation argument is viable, although more research is needed. Meanwhile, we recommend that researchers look beyond self-efficacy to identify the many and diverse sources of motivation for health-related behaviours.

**Keywords:** self-efficacy; outcome expectancy; motivation; perceived capability; health behaviour theory

### Introduction

Self-efficacy – defined as perceived capability to perform a target behaviour (Bandura, 1977, 1986, 1997, 2004) – is a robust predictor of various health behaviours (Armitage & Conner, 2001; Godin & Kok, 1996), including physical activity (Bauman et al., 2012), healthy eating (AbuSabbah & Achterberg, 1997), smoking cessation (Gwaltney, Metrik, Kahler, & Shiffman, 2009), alcohol abstinence (Adamson, Sellman, & Frampton, 2009), health behaviour change among cancer survivors (Park & Gaffey, 2007) and general health outcomes (Holden, 1991). Self-efficacy is the primary explanatory construct in Bandura’s (1986, 1997) social cognitive theory – one of the most often used health behaviour theories (HBTs) (Glanz & Bishop, 2010) – and is included in several other often-used HBTs, including protection motivation theory (Rogers, 1983), the health belief

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model (Rosenstock, Strecher, & Becker, 1988) and the transtheoretical model (Prochaska & DiClemente, 1983). Additionally, *perceived behavioural control* in the theory of planned behaviour is defined and operationalised in ways that are similar to self-efficacy (Ajzen, 1991, 2002). Thus, the concept of self-efficacy is pervasive in health behaviour science.

One of the purported strengths of self-efficacy is that it *explains* why people are (or are not) motivated to perform health-related behaviours, rather than merely *predicting* who is (or is not) motivated to perform health-related behaviours. Specifically, according to self-efficacy theory (a component of social cognitive theory that emphasises the role of self-efficacy; Bandura, 1997), self-efficacy is positioned early in a causal chain of factors that are posited to determine behaviour. Self-efficacy influences behaviour directly and through its effects on expected outcomes of the behaviour, the setting of relevant and challenging goals, and perceived barriers to and facilitators of the target behaviour (Bandura, 1997). Self-efficacy, in turn, has four sources: mastery experiences, vicarious learning, verbal persuasion, and physiological and affective states at the time of the behavioural opportunity (Bandura, 1997). Thus, in self-efficacy theory, both the sources of self-efficacy and the mechanisms through which it influences behaviour are specified and can be used to design behavioural interventions.

Despite the popularity of self-efficacy theory and the predictive power of self-efficacy, some authors have argued that, because of the way that self-efficacy is typically operationalised – *confidence that I can do* the target behaviour (Bandura, 2006) – self-efficacy ratings are a *reflection* rather than a *determinant* of motivation to perform health-related behaviours (Borkovec, 1978; Cahill, Gallo, Lisman, & Weinstein, 2006; Corcoran, 1991, 1995; Eastman & Marzillier, 1984; French, 2013; Kazdin, 1978; Kirsch, 1982, 1985, 1995; Maddux, 1999; Williams, 2010; Wolpe, 1978). According to this self-efficacy-as-motivation argument, what people say they *can do* (i.e., self-efficacy ratings) is a proxy for motivation and is thus a *function of* numerous motivational factors that go well beyond the theorised four sources of self-efficacy. The implications of this argument are that (a) research showing that self-efficacy ratings are highly predictive of behaviour simply shows that people are likely to do what they are motivated to do, and (b) such findings are of limited use in *understanding* and *changing* health-related behaviours.

The purpose of this paper is to evaluate the validity of the self-efficacy-as-motivation argument in the context of health behaviour research. First, we discuss in more depth the conceptual definition of self-efficacy, its theorised independence and relationship with outcome expectancy, and its relevance to health behaviour. We then present in detail the self-efficacy-as-motivation argument and evaluate the argument through a review of empirical research. We end the paper with a discussion of implications for health behaviour research.

### Self-efficacy theory

According to self-efficacy theory, self-efficacy is defined as perceived capability to perform a target behaviour (Bandura, 1977, 1986, 1997, 2004). At the time that self-efficacy was first introduced, dominant theories of behaviour emphasised outcome expectancies: expectations of the outcomes that may result from successfully performing the target behaviour (Feather, 1982). Bandura's (1977) novel insight in his conceptualisation of self-efficacy (originally labelled 'efficacy expectancy') was distinguishing between (i) a person's motivation to perform a target behaviour based on expected

outcomes of the behaviour and (ii) his or her perceived capability to perform the behaviour:

An outcome expectancy is defined as a person's estimate that a given behaviour will lead to certain outcomes. An efficacy expectation is the conviction that one can successfully execute the behaviour required to produce the outcomes. Outcome and efficacy expectations are differentiated, because individuals can believe that a particular course of action will produce certain outcomes, but if they entertain serious doubts about whether they can perform the necessary activities such information does not influence their behaviour. (p. 193)

Thus, according to self-efficacy theory, self-efficacy and outcome expectancy are conceptually distinct. However, self-efficacy is also posited to have a causal influence on outcome expectancy, particularly when there are close ties between performance of the behaviour (e.g., winning a tennis match) and potential outcomes of the behaviour (e.g., receiving a trophy) (Bandura, 1997). Conversely, outcome expectancies are not – according to self-efficacy theory – a causal source of self-efficacy judgements (Bandura, 1978, 1986, 1997, 2004). That is, what people expect to occur as a result of the target behaviour should, according to self-efficacy theory, have no bearing on their perceived capability to perform the behaviour.

### Conceptualising and assessing self-efficacy in the context of health behaviour

In the context of health-related behaviours, self-efficacy is often conceptualised as perceived capability to perform the behaviour given various conditions or impediments:

Many areas of functioning are primarily concerned with self-regulatory efficacy to guide and motivate oneself to get things done that one knows how to do. The issue is not whether one can do them occasionally but whether one has the efficacy to get oneself to do them regularly in the face of varied dissuading conditions. For example, consider the measurement of perceived self-efficacy to stick to a health-promoting exercise routine. Individuals judge how well they can get themselves to exercise regularly under various impediments, such as when they are under pressure from work, are tired, or are depressed; in foul weather; or when they have other commitments, or more interesting things to do. (Bandura, 1997, p. 43)

Consistent with Bandura's (1997) conceptualisation of self-regulatory efficacy, measures of exercise self-efficacy require respondents to rate their confidence that they *can* (or *could*) exercise in the context of potential barriers, such as when they have visitors or when there are other more interesting things to do (Bandura, 2006; Marcus, Selby, Niaura, & Rossi, 1992; McAuley, 1992; Sallis, Pinski, Grossman, Patterson, & Nader, 1988). Measures of self-efficacy for smoking abstinence require respondents to rate their confidence that they *could* abstain from smoking or drinking in the context of potentially tempting situations, such as when they feel depressed or are celebrating something (Etter, Bergman, Humair, & Perneger, 2000). Likewise, measures of healthy eating behaviour require respondents to rate their confidence that they *can* (or *could*) resist eating unhealthy foods or eat healthy foods in a variety of challenging situations, such as when watching television or eating at a restaurant (Bandura, 2006; Clark, Abrams, Niaura, Eaton, & Rossi, 1991).

In contrast to self-regulatory efficacy, *task self-efficacy* involves one's belief that he or she can or cannot perform a single instance of a circumscribed behaviour at different levels of performance. For example, assessment of task self-efficacy may involve asking

respondents to rate their perceived capability that they *can* walk around a track within 4 minutes, 6 minutes, 8 minutes, etc. (McAuley, Courneya, & Lettunich, 1991).

In addition to distinguishing between task self-efficacy and self-regulatory efficacy, other researchers have distinguished among additional self-efficacy subtypes that are relevant to a particular health behaviour domain and/or particular contextual features of the behaviour. For example, Schwarzer and Renner (2000) distinguish between *action self-efficacy* as confidence that the subject *can* (or *could*) perform the behaviour even when it requires setting goals and planning, and *coping self-efficacy* as confidence that the subject *can* (or *could*) perform the behaviour even in the face of initial setbacks or lack of social support. In the context of addiction, self-efficacy has been divided into five subtypes, which refer to confidence that one *can* abstain from the addictive behaviour when under stress (*coping self-efficacy*), perform treatment-related behaviours such as self-monitoring (*treatment self-efficacy*), recover from a slip or temptation (*recovery self-efficacy*), abstain in provocative situations (*control self-efficacy*), or abstain in the face of cues or triggers (*abstinence self-efficacy*) (DiClemente, Fairhurst, & Piotrowski, 1995; see Marlatt, Baer, & Quigley, 1995 for a different distinction among addiction self-efficacy subtypes, including resistance, harm-reduction, action, coping and recovery self-efficacy).

What varies across these conceptualisations of self-efficacy is whether perceived capability to perform the target behaviour is to be judged in isolation (i.e., task self-efficacy), or under various conditions, such as in the context of potential barriers (i.e., self-regulatory efficacy), when initiating a new behaviour (i.e., initiation self-efficacy), following relapse (i.e., recovery self-efficacy), or in the face of potentially stressful life events (i.e., coping self-efficacy).

### Assessing self-efficacy: 'Can you do [target behaviour]?'

Regardless of whether or not self-efficacy judgements are assessed in isolation from a given context (i.e., task self-efficacy) or under various conditions (e.g., self-regulatory efficacy, coping self-efficacy), assessment of self-efficacy typically involves asking respondents to rate their confidence that they *can* (or *could*) do the target behaviour. Alternatively, rather than explicitly assessing whether the respondent *can/could* do the target behaviour, some self-efficacy assessments involve asking participants whether they *would be able to* do the target behaviour (e.g., Rhodes & Courneya, 2004) or assess participants' *confidence to* do the target behaviour (versus confidence that one 'can' do the target behaviour; e.g., DiClemente, Carbonari, Montgomery, & Hughes, 1994). All of these operationalisations (*can/could*, *ability to*, or *confidence to* do the target behaviour) are consistent with the conceptual definition of self-efficacy: i.e., perceived capability to perform the target behaviour (Bandura, 1977, 1997, 2006).

### The self-efficacy-as-motivation argument

Several previous authors have argued that what people say they *can* or *cannot* do (i.e., self-efficacy rating) often does not reflect perceived capability (i.e., self-efficacy), but instead reflects the broader concept of motivation, particularly for behaviours that people already assume they are maximally capable of performing (Borkovec, 1978; Corcoran, 1991, 1995; Eastman & Marzillier, 1984; Kazdin, 1978; Kirsch, 1985, 1995; Maddux, 1999; Wolpe, 1978). This position is perhaps best exemplified by Kirsch (1995):

Consider your answers to the following questions: Could you eat a live worm? Could you laugh out loud during the middle of a funeral? Could you kill a baby kitten? I assume you would answer at least some of these questions negatively. Why? Do you lack the conviction that you can successfully execute these behaviours [(Bandura, 1977)]? Do you lack the 'capability to organize and execute' these actions [(Bandura, 1986, p. 391)]? Perhaps you lack the 'capabilities to exercise control' over these events [(Bandura, 1989, p. 1175)]. I expect that none of these reasons explain your low self-efficacy ratings. More likely you are 'unable' to do these things because doing so would evoke extreme disgust, embarrassment, guilt, or shame. Clearly, when you say you cannot do these things, you mean something different than when you say you cannot solve a difficult calculus problem, lift a 300-pound weight, or successfully execute the job requirements of an astronaut. (pp. 338–339)

Kirsch (1995) distinguishes here between two meanings of the colloquial use of the phrase *can do*. One meaning reflects perceived capability per se based on one's estimation of their actual capability to perform a task (i.e., the original definition of efficacy expectancy as distinct from outcome expectancy). The second meaning reflects motivation based on – in his examples – anticipated 'disgust, embarrassment, guilt, or shame'. Thus, if the goal is to *understand* and/or *change* behaviour (rather than merely predict behaviour), then it is important to know whether responses to self-efficacy items (i.e., what people say they *can do*) reflect perceived capability per se or the much broader concept of motivation. Indeed, relative to perceived capability and its four theorised sources (Bandura, 1997), motivation is a function of a wider range of sources, including expected positive and negative instrumental and affective outcomes of the behaviour (Ajzen, 1985; Fishbein, 2008).

Ratings of self-regulatory efficacy for health-related behaviours may be particularly likely to reflect motivation rather than perceived capability because differential responses to each item are a function of what the respondent expects will occur (i.e., outcome expectancies) if he or she performs the target behaviour in the given context (Williams, 2010). For example, in the context of an exercise self-efficacy questionnaire an individual's ratings of whether or not she *can exercise* are a function of the different contingencies that are present when exercising in each of the specified contexts: when it is raining, when I (respondent) am feeling tired, am under pressure from work or there is bad weather (Figure 1).

### **Self-efficacy for health-related behaviours: perceived capability or motivation?**

The self-efficacy-as-motivation argument is not merely an intellectual exercise. It has potential implications for understanding and facilitating change in health-related behaviours. When people rate themselves as having low self-efficacy for exercise, healthy eating or quitting smoking, it is important to know whether they perceive themselves to be incapable of performing these behaviours (i.e., literal perceived incapability, consistent with the original definition of efficacy expectancy) or if their low self-efficacy rating is instead a reflection of low motivation, with its potentially numerous and diverse sources. Below, we review three types of evidence that suggest that self-efficacy for health-related behaviours may actually reflect the broader concept of motivation.

### **Does experimental manipulation of outcome expectancy influence self-efficacy ratings?**

According to self-efficacy theory, expected outcomes of a target behaviour should not causally influence self-efficacy ratings (Bandura, 1978, 1986, 1997, 2004). Instead,

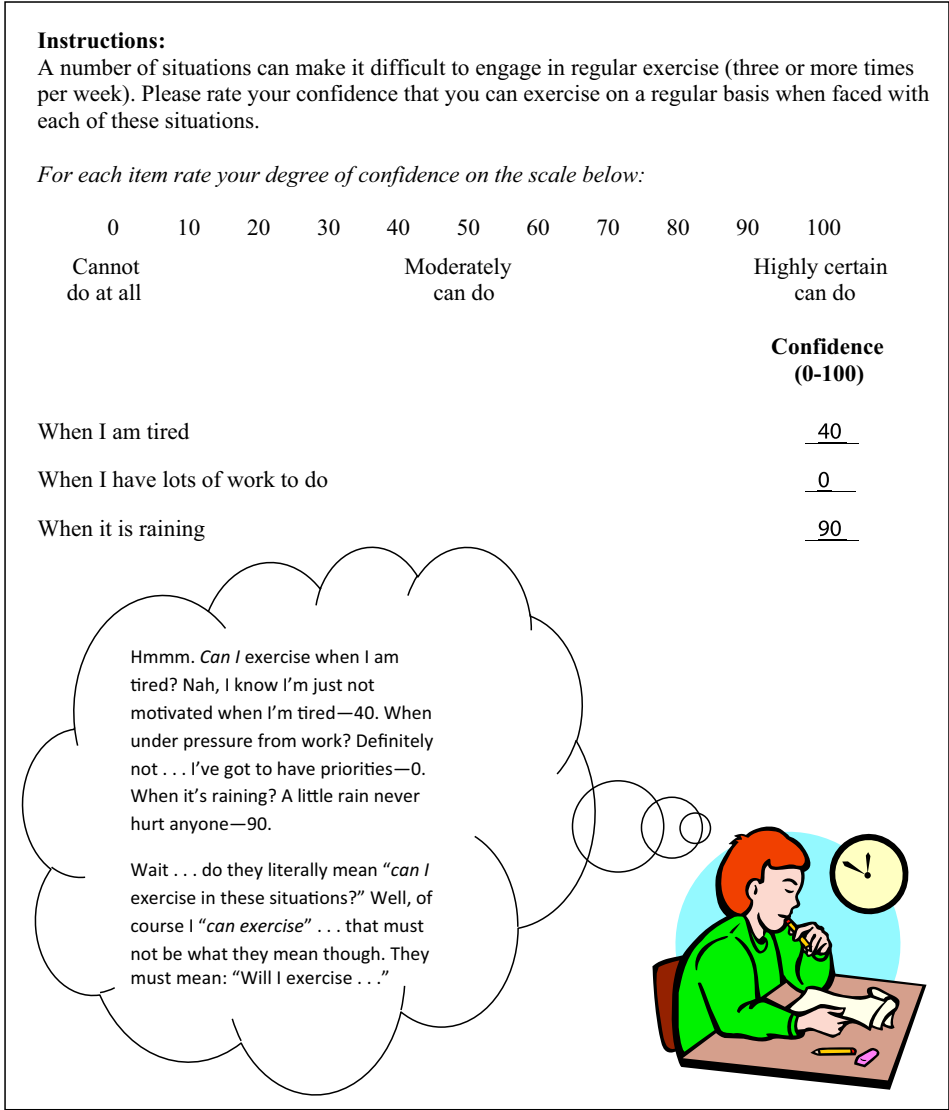


Figure 1. Colloquial interpretation of the phrases *can do* and *cannot do* in standard self-efficacy assessments. Self-efficacy instructions and items adapted from Bandura (2006).

a causal influence of outcome expectancy on self-efficacy ratings is consistent with the self-efficacy-as-motivation argument, suggesting that self-efficacy ratings reflect the broader concept of motivation, rather than perceived capability. We located three studies in which an experimental manipulation focused exclusively on changing expected outcomes of the target behaviour (e.g., offer of monetary incentives for performing the behaviour) showed effects on subsequent assessments of self-efficacy.

First, Corcoran and Rutledge (1989) tested the causal effects of outcome expectancy on self-efficacy ratings among college student smokers. Participants first responded (yes/no) to the questions ‘could you shoot a basketball through a basket from [increasing



distances]’ and ‘could you quit cigarette smoking for [escalating time periods]’. They then rated whether they ‘could’ perform those same tasks in the context of hypothetical monetary incentives (i.e., outcome expectancies). Participants were more likely to say that they ‘could’ quit smoking or make basketball shots (i.e., had higher self-efficacy) under the hypothetical incentive scenario. The effect of incentives was greater for ratings of smoking self-efficacy than basketball self-efficacy, thus indicating (consistent with the self-efficacy-as-motivation argument) that the causal effects of outcome expectancy on self-efficacy is stronger for behaviours that involve regulation of behaviour (i.e., quitting smoking) rather than specialised physical skills (i.e., basketball shooting).

Second, Baker and Kirsch (1991) examined the causal effects of outcome expectancy on self-efficacy in the context of pain behaviour. College students were randomly assigned to receive either (actual) escalating monetary incentives for longer exposure to pain via the cold pressor task, or to not receive incentives. Participants rated their self-efficacy for pain tolerance by indicating whether they ‘expected they would be able to keep their hand immersed’ for escalating 30-second intervals up to 8 minutes. Actual pain tolerance was assessed via length of voluntary exposure to the cold pressor. The incentive (i.e., outcome expectancy) manipulation had causal effects on both self-efficacy ratings and pain tolerance; thus, the association between self-efficacy and pain behaviour was explained by the fact that those participants who were offered the incentives had higher ratings of self-efficacy.

Third, McDonald, O’Brien, Farr, and Haaga (2010) conducted a pilot study of a ‘looming vulnerability’ intervention among community-dwelling smokers. The intervention consisted of four three-minute audio-taped imagery exercises in which participants were instructed to engage in negative imagery regarding the health consequences of smoking. A control condition engaged in matched imagery exercises that did not include smoking-related content. Self-efficacy was assessed by first asking respondents to rate (yes/no) whether they ‘could control [their] smoking behaviour’ in a variety of contexts, and then, for all those items answered affirmatively their ‘confidence’ (on a scale of 10–100) that they could control their smoking behaviour. Immediately following the manipulation, participants in the intervention condition reported higher self-efficacy relative to participants in the control condition. Interestingly, stronger self-efficacy ratings were a causal outcome of an intervention focusing on increasing negative outcome expectancies, thus showing that higher self-efficacy ratings can be a function of increased motivation to avoid negative outcomes, as well as motivation to obtain positive outcomes (i.e., incentives).

We located four additional studies that showed no effects of an outcome expectancy manipulation on subsequent self-efficacy ratings. However, in these studies, the null effects of the outcome expectancy manipulation on self-efficacy may have been due to a weak manipulation. Indeed, in two studies involving the use of monetary incentives, there was no effect of the intervention on any of the measured outcomes, including the targeted behaviour (i.e., pain endurance and physical activity) and multiple hypothesised mediators, including self-efficacy (Hunter, Tully, Davis, Stevenson, & Kee, 2013; Symbaluk, Heth, Cameron, & Pierce, 1997). In a third study, the effects of monetary incentives again showed no influence on the target behaviour (i.e., exercise persistence) or on self-efficacy, but did show an effect on exercise enjoyment (Kerr, Feltz, & Irwin, 2012). A fourth study showed no effect of a one-time print-based communication emphasising the outcomes of quitting smoking on self-efficacy ratings taken 2 weeks later, with the intervention affecting only 3 of 10 measured outcome expectancy subtypes (Dijkstra, De Vries, & Roijackers, 1998). Thus, the potential evidence against the

self-efficacy-as-motivation argument is somewhat tempered by the apparently weak manipulations of outcome expectancy in these studies.

Finally, in four studies, outcome expectancy was manipulated but effects on self-efficacy were not assessed (Dijkstra, Conijn, & De Vries, 2006; Strecher et al., 2008) or focused on ease or difficulty of the behaviour rather than perceived capability per se (e.g., 'quitting smoking would be very difficult and uncomfortable for me' (Maddux & Rogers, 1983); 'it would be easy for me to complete the eight-week [exercise] program' (Stanley & Maddux, 1986)), and thus were not in accordance with self-efficacy theory.

### **Does holding motivation constant affect self-efficacy ratings?**

Since, according to self-efficacy theory, self-efficacy is defined as perceived capability independent of motivation (Bandura, 1977, 1986, 1997), there should be no difference between responses to a standard self-efficacy assessment and an assessment of self-efficacy in which motivation is held constant. Conversely, if standard measures of self-efficacy actually tap the broad concept of motivation (i.e., the self-efficacy-as-motivation argument), then holding motivation constant should lead to responses that differ from responses to standard self-efficacy assessments.

In a series of studies, Rhodes and colleagues assessed exercise self-efficacy by asking participants to rate their confidence that they 'could' exercise (Rhodes & Blanchard, 2007), that they 'will be able to' exercise (Rhodes & Courneya, 2004) or a combination of these two formats (Rhodes & Courneya, 2003). In all three studies, self-efficacy was assessed with and without the qualifier 'if you wanted to' (e.g., 'How confident are you that you will be able to exercise regularly over the next two weeks *if you really wanted to*'; emphasis added), thus attempting to assess participants' perceived capability for performing exercise independent of motivational factors. In all three studies, self-efficacy items in which motivation was held at a constant positive (i.e., 'if you wanted to') resulted in higher mean scores than standard self-efficacy items in which motivation was not held constant, thus indicating that responses to the standard items incorporate motivation. Additionally, in all three studies, the association between the modified self-efficacy items and behavioural intention was weaker relative to the association between standard assessments of self-efficacy and behavioural intention. The latter findings may be due in part to a ceiling effect – i.e., the modified self-efficacy items were not predictive because responses approached maximum perceptions of capability when motivation was controlled, and thus were not helpful in predicting intention. Taken together, these findings again indicate that standard self-efficacy items are not conceptually distinct from assessments of motivation (i.e., behavioural intention).

### **Do people cite motivational factors as reasons for their self-efficacy ratings?**

Finally, if, as indicated in self-efficacy theory, self-efficacy is independent of motivation, then motivational factors should not be considered in responses to standard self-efficacy assessments. However, when Rhodes and Blanchard (2007) used a thought-listing procedure to assess the reasons for participants' responses to exercise self-efficacy items, respondents indicated that expectations of improved health (30%), enjoyment (19%) and motivation (37%) influenced their self-efficacy ratings (Rhodes & Blanchard, 2007). Consistent with the self-efficacy-as-motivation argument, these findings suggest that motivational factors have a causal influence on self-efficacy ratings.

### An important caveat

The self-efficacy-as-motivation argument – as alluded to by Kirsch (1995) and explicated herein – directly applies to operationalisations of self-efficacy employing the format: ‘I can do [target behaviour]’, because of a tendency to interpret colloquial use of the phrase ‘I can’ as ‘I will’. This method of operationalising self-efficacy in terms of what the respondent *can do* is directly in line with Bandura’s conceptualisation of self-efficacy and guidelines for constructing self-efficacy scales (Bandura, 1997, 2006). However, as noted above, not all operationalisations of self-efficacy follow this *can do* format. Thus, it remains an open question as to whether the self-efficacy-as-motivation argument, which focuses on colloquial use of the phrase *can do*, also applies to other self-efficacy operationalisations.

Intuitively, the self-efficacy-as-motivation argument should also apply to operationalisations of self-efficacy in which respondents are asked to rate whether they *would be able* to do the target behaviour (Rhodes & Courneya, 2004) or that assess participants’ *confidence in performing the target behaviour* (DiClemente et al., 1994), rather than explicitly assessing whether the respondent *can do* the target behaviour. Indeed, use of the word ‘would’ in the *would be able to* format is consistent with assessment of behavioural intention, perhaps making this format particularly susceptible to the self-efficacy-as-motivation argument. Moreover, among the studies reviewed above, which support the self-efficacy-as-motivation argument, two used the *would be able to* format (Baker & Kirsch, 1991; Rhodes & Courneya, 2004) and the third study used a combination of *can do* and *would be able to* formats (Rhodes & Courneya, 2003). These findings suggest that the self-efficacy-as-motivation argument, which directly refers to the *can do* phrasing (Kirsch, 1995), may also apply to other subtly different self-efficacy operationalisations. However, more research is needed. At a minimum, researchers should employ discriminant validity checks when assessing both self-efficacy and motivation (i.e., behavioural intention).

Likewise, measures of perceived behavioural control – when operationalised in terms of *ease/difficulty* of the behaviour or *control* over the behaviour (i.e., Ajzen, 2002) – may also be confounded by motivation. That is, questionnaire respondents may consider expected outcomes of the target behaviour when rating its ease/difficulty or their perceived control over the behaviour. Indeed, a recent study shows that standard perceived behavioural control questionnaire items (i.e., ease/difficulty and controllability) also tap perceived capability (i.e., self-efficacy), thus suggesting overlap in these items (Johnston et al., 2014). Moreover, Rhodes and Courneya (2004) – in their study in which they controlled for motivation when assessing self-efficacy by adding the qualifier ‘if you wanted to’ to each item (see above) – obtained similar findings for items assessing *ease/difficulty* of exercise. That is, ease/difficulty items in which motivation was held at a constant positive resulted in higher mean scores and weaker correlations with behavioural intention than standard ease/difficulty items in which motivation was not held constant, thus indicating that responses to the standard items incorporate motivation. On the other hand, two studies on exercise (Stanley & Maddux, 1986) and smoking cessation (Maddux & Rogers, 1983) did not show an effect of an outcome expectancy manipulation on ease/difficulty items. Thus, more research is needed to determine whether the self-efficacy-as-motivation argument also applies to perceived behavioural control.

## Discussion

The basic premise of the original conceptualisation of self-efficacy – a premise that made the concept novel in the prevailing outcome-expectancy-dominated theoretical landscape – was that perceived capability to perform a target behaviour is conceptually independent of motivation to perform the behaviour (Bandura, 1977). Conversely, according to the self-efficacy-as-motivation argument, ratings of self-efficacy (i.e., ‘I can do [target behaviour]’) actually reflect the much broader concept of motivation, including (but not limited to) expected outcomes of the behaviour.

We reviewed research that provides a direct test of the self-efficacy-as-motivation argument. Evidence was mixed in experimental studies, with three studies showing causal effects of outcome expectancy on subsequent self-efficacy ratings and four studies showing null effects. However, there was some indication that the null effects in the latter studies – particularly in two of the four studies – may have been due to weak manipulations of outcome expectancy. An additional three studies showed that controlling for motivation by adding the phrase ‘if you wanted to’ to the end of self-efficacy items led to increased self-efficacy ratings and decreased associations between self-efficacy ratings and motivation (i.e., behavioural intention). Finally, a single qualitative study demonstrated that self-efficacy ratings have motivational antecedents.

A conservative interpretation of the findings is that the self-efficacy-as-motivation argument remains a viable approach to interpreting self-efficacy research. However, more research is needed given the relatively small number of supporting studies. Nonetheless, the continued viability of the self-efficacy-as-motivation argument has significant implications for on-going attempts to understand and change health-related behaviours. If the argument continues to be supported, it would suggest that while self-efficacy ratings tell us *that* people are motivated to engage in the target health behaviour, they tell us little about *why* people are motivated. For example, in the context of exercise, self-efficacy ratings may be a function of (i) perceived physical incapability (consistent with self-efficacy theory); but also (ii) expected instrumental and affective outcomes of exercising, (iii) expected outcomes of not performing competing alternative behaviours (e.g., work, chores) or (iv) any number of other motivational factors that lead people to say they ‘can’ or ‘cannot’ perform the behaviour in question (e.g., liking/disliking exercise versus competing sedentary behaviours).

## Alternative approaches to research on self-efficacy

Although direct recommendations may be premature given the need for further research, we offer the following suggestions to illustrate the potential implications of the self-efficacy-as-motivation argument. First, the vast literature in which self-efficacy is predictive of health-related behaviours (e.g., Gwaltney, Metrik, Kahler, & Shiffman, 2009), as well as research on how to change self-efficacy ratings (Prestwich et al., 2014), should not be ignored even if the measures of self-efficacy in this literature are confounded with motivation. Instead, self-efficacy assessments may be viewed as an alternative assessment of motivation (perhaps labelled ‘can-do motivation’), with the vast literature on self-efficacy and health-related behaviour reinterpreted to indicate that motivation – not merely perceived capability – is predictive of health-related behaviour. ‘Can-do motivation’ would then be positioned as the most proximal determinant of behaviour, as is currently the case with behavioural intention (Figure 2), with the caveat that can-do motivation and behavioural intention may often be largely redundant (Rhodes & Courneya, 2003).

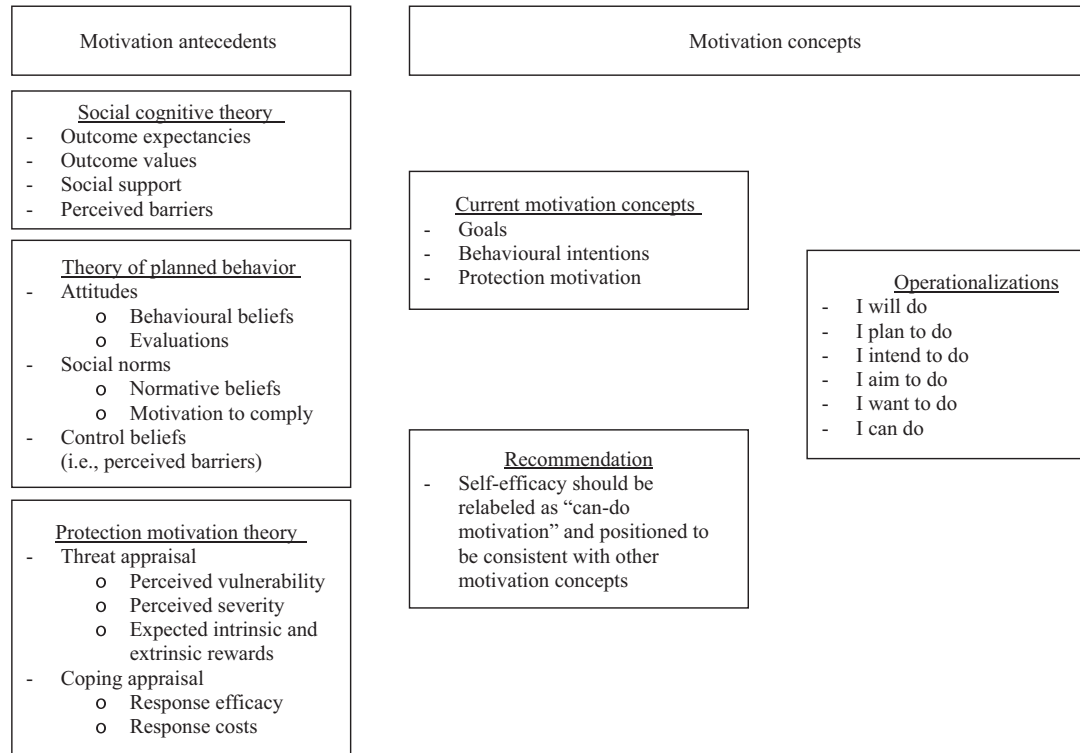


Figure 2. According to the self-efficacy-as-motivation argument, ‘I can do’ is colloquially interpreted as motivation (e.g., ‘I will do’). Accordingly, ‘self-efficacy’ should be relabelled and repositioned as ‘can-do motivation’ in the context of HBTs such as social cognitive theory, the theory of planned behaviour and protection motivation theory.

Second, the jargon-free term *perceived capability* might be used as a label for *perceptions of physical and mental ability, capacity, or competence to perform a specific circumscribed behaviour independent of motivation to perform the behaviour*. This concept of *perceived capability* would be similar to Bandura's (1977) original *efficacy expectancy*. However, in measuring perceived capability, steps might be taken to ensure that ratings are independent of motivational factors (see Cahill et al., 2006; Rhodes & Blanchard, 2007; Rhodes & Courneya, 2003, 2004). Although it is an empirical question, we venture to guess that perceived capability – if free from motivational confounds – is not likely to be predictive of most health behaviours in most populations, with the possible exception of some clinical populations (e.g., perceived capability for ambulation following a hip replacement). Nonetheless, parsing of perceived capability from motivational factors would allow researchers and interventionists to identify the (likely few) populations and behaviours for which perceived capability is likely to be low and thus a viable target for intervention.

Third, health behaviour scientists should attempt to identify the sources of variance in 'can-do motivation' (i.e., traditional measures of self-efficacy) that go beyond perceived capability, including diverse motivational factors that influence health-related behaviours. In this paper, we have focused on the causal influence of instrumental outcome expectancies on self-efficacy assessments in order to illustrate empirical support for the self-efficacy-as-motivation argument. However, studies have repeatedly shown that traditional measures of self-efficacy explain variance in behaviour beyond that accounted for by instrumental outcome expectancies (for reviews, see Bandura, 1984, 1991). Thus, it is necessary to identify additional motivational factors that explain variance in traditional measures of self-efficacy (i.e., 'can-do motivation') and, in turn, health-related behaviours. Several recent articles illustrate the potential for expanding research on motivational determinants of health-related behaviours, including affective processes (Desteno, Gross, & Kubzansky, 2013; Williams & Evans, 2014), non-conscious processes (Hofmann, Friese, & Wiers, 2008; Sheeran, Gollwitzer, & Bargh, 2013), perceived opportunity to perform the target behaviour (Rhodes, Blanchard, & Matheson, 2006), perceived temporal proximity of behavioural outcomes (de Ridder & de Wit, 2007; Hall & Fong, 2007) and competing motives for alternative behaviours (Rhodes & Blanchard, 2008; Richetin, Conner, & Perugini, 2011).

## Conclusions

Self-efficacy is arguably the most popular and predictive construct in health behaviour research, and a self-efficacy-type construct has been included within all of the predominant HBTs. Despite this enormous popularity, the self-efficacy-as-motivation argument holds that – contrary to self-efficacy theory – self-efficacy ratings are highly predictive of behaviour merely because such ratings reflect a broad range of behavioural motives. Such conceptual and operational inconsistencies in self-efficacy research are potentially hindering our understanding of health behaviours and masking appropriate antecedent targets in interventions. Research reviewed herein suggests that the self-efficacy-as-motivation argument is a viable interpretation of the voluminous literature on self-efficacy, although more research is needed. Meanwhile, we recommend that researchers focus greater attention on the many and diverse sources of motivation that are often neglected in the health behaviour literature.



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## References

- AbuSabbah, R., & Achterberg, C. (1997). Review of self-efficacy and locus of control for nutrition- and health-related behaviour. *Journal of the American Dietetic Association*, 97, 1122–1132. doi:10.1016/S0002-8223(97)00273-3
- Adamson, S. J., Sellman, J. D., & Frampton, C. M. (2009). Patient predictors of alcohol treatment outcome: A systematic review. *Journal of Substance Abuse and Treatment*, 36, 75–86. doi:10.1016/j.jsat.2008.05.007
- Ajzen, I. (1985). From intentions to actions: A theory of planned behaviour. In J. Kuhl & J. Beckmann (Eds.), *Action control: From cognition to behaviour* (pp. 11–39). New York, NY: Springer.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179–211. doi:10.1016/0749-5978(91)90020-T
- Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. *Journal of Applied Social Psychology*, 32, 665–683. doi:10.1111/j.1559-1816.2002.tb00236.x
- Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behaviour: A meta-analytic review. *British Journal of Social Psychology*, 40, 471–499. doi:10.1348/014466601164939
- Baker, S. L., & Kirsch, I. (1991). Cognitive mediators of pain perception and tolerance. *Journal of Personality and Social Psychology*, 61, 504–510. doi:10.1037/0022-3514.61.3.504
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioural change. *Psychological Review*, 84, 191–215. doi:10.1037/0033-295X.84.2.191
- Bandura, A. (1978). Reflections on self-efficacy. *Advances in Behaviour Research and Therapy*, 1, 237–269. doi:10.1016/0146-6402(78)90012-7
- Bandura, A. (1984). Recycling misconceptions on perceived self-efficacy. *Cognitive Therapy and Research*, 8, 231–255. doi:10.1007/BF01172995
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist*, 44, 1175–1184. doi:10.1037/0003-066X.44.9.1175
- Bandura, A. (1991). Human agency: The rhetoric and the reality. *American Psychologist*, 46, 157–162. doi:10.1037/0003-066X.46.2.157
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: W.H. Freeman and Co.
- Bandura, A. (2004). Health promotion by social cognitive means. *Health Education and Behavior*, 31, 143–164. doi:10.1177/1090198104263660
- Bandura, A. (2006). Guide for constructing self-efficacy scales. In F. Pajares & T. C. Urdan (Eds.), *Self-efficacy beliefs of adolescents* (pp. 307–337). Greenwich, CT: Information Age.
- Bauman, A. E., Reis, R. S., Sallis, J. F., Wells, J. C., Loos, R. J., & Martin, B. W. (2012). Correlates of physical activity: Why are some people physically active and others not? *Lancet*, 380, 258–271. doi:10.1016/S0140-6736(12)60735-1
- Borkovec, T. D. (1978). Self-efficacy: Cause or reflection of behavioural change? *Advances in Behaviour Research and Therapy*, 1, 163–170. Retrieved from <http://www.sciencedirect.com/science/journal/01466402>
- Cahill, S. P., Gallo, L. A., Lisman, S. A., & Weinstein, A. (2006). Willing or able? The meanings of self-efficacy. *Journal of Social and Clinical Psychology*, 25, 196–209. doi:10.1521/jscp.2006.25.2.196
- Clark, M. M., Abrams, D. B., Niaura, R. S., Eaton, C. A., & Rossi, J. S. (1991). Self-efficacy in weight management. *Journal of Consulting and Clinical Psychology*, 59, 739–744. doi:10.1037/0022-006X.59.5.739

- Corcoran, K. J. (1991). Efficacy, "skills," reinforcement, and choice behaviour. *American Psychologist*, 46, 155–157. doi:[10.1037/0003-066X.46.2.155](https://doi.org/10.1037/0003-066X.46.2.155)
- Corcoran, K. J. (1995). Understanding cognition, choice, and behaviour. *Journal of Behavior Therapy and Experimental Psychiatry*, 26, 201–207. doi:[10.1016/0005-7916\(95\)00020-Z](https://doi.org/10.1016/0005-7916(95)00020-Z)
- Corcoran, K. J., & Rutledge, M. W. (1989). Efficacy expectation changes as a function of hypothetical incentives in smokers. *Psychology of Addictive Behaviors*, 3, 22–29. doi:[10.1037/h0080563](https://doi.org/10.1037/h0080563)
- de Ridder, D., & de Wit, J. (2007). Current issues and new directions in psychology and health: Back to the future: What good are health goals in the presence of immediate interests? *Psychology and Health*, 22, 513–516. doi:[10.1080/14768320701374626](https://doi.org/10.1080/14768320701374626)
- Desteno, D., Gross, J. J., & Kubzansky, L. (2013). Affective science and health: The importance of emotion and emotion regulation. *Health Psychology*, 32, 474–486. doi:[10.1037/a0030259](https://doi.org/10.1037/a0030259)
- DiClemente, C. C., Carbonari, J. P., Montgomery, R. P., & Hughes, S. O. (1994). The alcohol abstinence self-efficacy scale. *Journal of Studies on Alcohol*, 55, 141–148. Retrieved from [www.jsad.com](http://www.jsad.com)
- DiClemente, C. C., Fairhurst, S. K., & Piotrowski, N. A. (1995). Self-efficacy and addictive behaviours. In J. E. Maddux (Ed.), *Self-efficacy, adaptation, and adjustment: Theory, research, and application* (pp. 109–142). New York, NY: Plenum Press.
- Dijkstra, A., Conijn, B., & De Vries, H. (2006). A match-mismatch test of a stage model of behaviour change in tobacco smoking. *Addiction*, 101, 1035–1043. doi:[10.1111/j.1360-0443.2006.01419.x](https://doi.org/10.1111/j.1360-0443.2006.01419.x)
- Dijkstra, A., De Vries, H., & Roijackers, J. (1998). Computerized tailored feedback to change cognitive determinants of smoking: A Dutch field experiment. *Health Education Research*, 13, 197–206. doi:[10.1093/her/13.2.197](https://doi.org/10.1093/her/13.2.197)
- Eastman, C., & Marzillier, J. S. (1984). Theoretical and methodological difficulties in Bandura's self-efficacy theory. *Cognitive Therapy and Research*, 8, 213–229. doi:[10.1007/BF01172994](https://doi.org/10.1007/BF01172994)
- Etter, J. F., Bergman, M. M., Humair, J. P., & Perneger, T. V. (2000). Development and validation of a scale measuring self-efficacy of current and former smokers. *Addiction*, 95, 901–913. doi:[10.1046/j.1360-0443.2000.9569017.x](https://doi.org/10.1046/j.1360-0443.2000.9569017.x)
- Feather, N. T. (1982). *Expectations and actions: Expectancy-value models in psychology*. Hillsdale, NJ: Erlbaum.
- Fishbein, M. (2008). A reasoned action approach to health promotion. *Medical Decision Making*, 28, 834–844. doi:[10.1177/0272989X08326092](https://doi.org/10.1177/0272989X08326092)
- French, D. P. (2013). The role of self-efficacy in changing health-related behaviour: Cause, effect or spurious association? *British Journal of Health Psychology*, 18, 237–243. doi:[10.1111/bjhp.12038](https://doi.org/10.1111/bjhp.12038)
- Glanz, K., & Bishop, D. B. (2010). The role of behavioural science theory in development and implementation of public health interventions. *Annual Review of Public Health*, 31, 399–418. doi:[10.1146/annurev.publhealth.012809.103604](https://doi.org/10.1146/annurev.publhealth.012809.103604)
- Godin, G., & Kok, G. (1996). The theory of planned behaviour: A review of its applications to health-related behaviours. *American Journal of Health Promotion*, 11, 87–98. doi:[10.4278/0890-1171-11.2.87](https://doi.org/10.4278/0890-1171-11.2.87)
- Gwaltney, C. J., Metrik, J., Kahler, C. W., & Shiffman, S. (2009). Self-efficacy and smoking cessation: A meta-analysis. *Psychology of Addictive Behaviors*, 23, 56–66. doi:[10.1037/a0013529](https://doi.org/10.1037/a0013529)
- Hall, P. A., & Fong, G. T. (2007). Temporal self-regulation theory: A model for individual health behaviour. *Health Psychology Review*, 1, 6–52. doi:[10.1080/17437190701492437](https://doi.org/10.1080/17437190701492437)
- Hofmann, W., Friese, M., & Wiers, R. W. (2008). Impulsive versus reflective influences on health behaviour: A theoretical framework and empirical review. *Health Psychology Review*, 2, 111–137. doi:[10.1080/17437190802617668](https://doi.org/10.1080/17437190802617668)
- Holden, G. (1991). The relationship of self-efficacy appraisals to subsequent health related outcomes: A meta-analysis. *Social Work in Health Care*, 16, 53–93. doi:[10.1300/J010v16n01\\_05](https://doi.org/10.1300/J010v16n01_05)
- Hunter, R. F., Tully, M. A., Davis, M., Stevenson, M., & Kee, F. (2013). Physical activity loyalty cards for behavior change: A quasi-experimental study. *American Journal of Preventive Medicine*, 45, 56–63. doi:[10.1016/j.amepre.2013.02.022](https://doi.org/10.1016/j.amepre.2013.02.022)
- Johnston, M., Dixon, D., Hart, J., Glidewell, L., Schröder, C., & Pollard, B. (2014). Discriminant content validity (DCV): A quantitative methodology for assessing content of theory-based



- measures, with illustrative applications. *British Journal of Health Psychology*, 19, 240–257. doi:10.1111/bjhp.12095
- Kazdin, A. E. (1978). Conceptual and assessment issues raised by self-efficacy theory. *Advances in Behaviour Research and Therapy*, 1, 177–185. Retrieved from <http://www.sciencedirect.com/science/journal/01466402>
- Kerr, N. L., Feltz, D. L., & Irwin, B. C. (2012). To pay or not to pay? Do extrinsic incentives alter the Köhler group motivation gain? *Group Processes and Intergroup Relations*, 16, 257–268. doi:10.1177/1368430212453632
- Kirsch, I. (1982). Efficacy expectations or response predictions: The meaning of efficacy ratings as a function of task characteristics. *Journal of Personality and Social Psychology*, 42, 132–136. doi:10.1037/0022-3514.42.1.132
- Kirsch, I. (1985). Self-efficacy and expectancy: Old wine with new labels. *Journal of Personality and Social Psychology*, 49, 824–830. doi:10.1037/0022-3514.49.3.824
- Kirsch, I. (1995). Self-efficacy and outcome expectancy: A concluding commentary. In J. E. Maddux (Ed.), *Self-efficacy, adaptation, and adjustment: Theory, research, and application* (pp. 341–345). New York, NY: Plenum Press.
- Maddux, J. E. (1999). Expectancies and the social-cognitive perspective: Basic principles, processes, and variables. In I. Kirsch (Ed.), *How expectancies shape experience* (pp. 17–39). Washington, DC: American Psychological Association.
- Maddux, J. E., & Rogers, R. W. (1983). Protection motivation and self-efficacy: A revised theory of fear appeals and attitude change. *Journal of Experimental Social Psychology*, 19, 469–479. doi:10.1016/0022-1031(83)90023-9
- Marcus, B. H., Selby, V. C., Niaura, R. S., & Rossi, J. S. (1992). Self-efficacy and the stages of exercise behaviour change. *Research Quarterly for Exercise and Sport*, 63, 60–66. doi:10.1080/02701367.1992.10607557
- Marlatt, G. A., Baer, J. S., & Quigley, L. A. (1995). Self-efficacy and addictive behaviour. In A. Bandura (Ed.), *Self-efficacy in changing societies* (pp. 289–315). New York, NY: Cambridge University.
- McAuley, E. (1992). The role of efficacy cognitions in the prediction of exercise behaviour in middle-aged adults. *Journal of Behavioral Medicine*, 15, 65–88. doi:10.1007/BF00848378
- McAuley, E., Courneya, K. S., & Lettunich, J. (1991). Effects of acute and long-term exercise on self-efficacy responses in sedentary, middle-aged males and females. *The Gerontologist*, 31, 534–542. doi:10.1093/geront/31.4.534
- McDonald, D., O'Brien, J., Farr, E., & Haaga, D. A. (2010). Pilot study of inducing smoking cessation attempts by activating a sense of looming vulnerability. *Addictive Behaviours*, 35, 599–606. doi:10.1016/j.addbeh.2010.02.008
- Park, C. L., & Gaffey, A. E. (2007). Relationships between psychosocial factors and health behaviour change in cancer survivors: An integrative review. *Annals of Behavioral Medicine*, 34, 115–134. doi:10.1007/BF02872667
- Prestwich, A., Kellar, I., Parker, R., MacRae, S., Learmonth, M., Sykes, B., ... Castle, H. (2014). How can self-efficacy be increased? Meta-analysis of dietary interventions. *Health Psychology Review*, 8, 270–285. doi:10.1080/17437199.2013.813729
- Prochaska, J. O., & DiClemente, C. C. (1983). Stages and processes of self-change of smoking: Toward an integrative model of change. *Journal of Consulting and Clinical Psychology*, 51, 390–395. doi:10.1037/0022-006X.51.3.390
- Rhodes, R. E., & Blanchard, C. M. (2007). What do confidence items measure in the physical activity domain? *Journal of Applied Social Psychology*, 37, 759–774. doi:10.1111/j.1559-1816.2007.00184.x
- Rhodes, R. E., & Blanchard, C. M. (2008). Do sedentary motives adversely affect physical activity? Adding cross-behavioural cognitions to the theory of planned behaviour. *Psychology & Health*, 23, 789–805. doi:10.1080/08870440701421578
- Rhodes, R. E., Blanchard, C. M., & Matheson, D. H. (2006). A multicomponent model of the theory of planned behaviour. *British Journal of Health Psychology*, 11, 119–137. doi:10.1348/135910705X52633
- Rhodes, R. E., & Courneya, K. S. (2003). Self-efficacy, controllability, and intention in the theory of planned behaviour: Measurement redundancy or causal independence? *Psychology & Health*, 18, 79–91. doi:10.1080/0887044031000080665

- Rhodes, R. E., & Courneya, K. S. (2004). Differentiating motivation and control in the theory of planned behaviour. *Psychology, Health, and Medicine*, 9, 205–215. doi:[10.1080/13548500410001670726](https://doi.org/10.1080/13548500410001670726)
- Richetin, J., Conner, M., & Perugini, M. (2011). Not doing is not the opposite of doing: Implications for attitudinal models of behavioural prediction. *Personality and Social Psychology Bulletin*, 37, 40–54. doi:[10.1177/0146167210390522](https://doi.org/10.1177/0146167210390522)
- Rogers, R. W. (1983). Cognitive and physiological processes in fear appeals and attitude change: A revised theory of protection motivation. In J. T. Cacioppo & R. E. Petty (Eds.), *Social psychophysiology: A sourcebook* (pp. 153–176). New York, NY: Guilford Press.
- Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1988). Social learning theory and the health belief model. *Health Education Quarterly*, 15, 175–183. doi:[10.1177/109019818801500203](https://doi.org/10.1177/109019818801500203)
- Sallis, J. F., Pinski, R. B., Grossman, R. M., Patterson, T. L., & Nader, P. R. (1988). The development of self-efficacy scales for health-related diet and exercise behaviours. *Health Education Research*, 3, 283–292. doi:[10.1093/her/3.3.283](https://doi.org/10.1093/her/3.3.283)
- Schwarzer, R., & Renner, B. (2000). Social-cognitive predictors of health behavior: Action self-efficacy and coping self-efficacy. *Health Psychology*, 19, 487–495. doi:[10.1037/0278-6133.19.5.487](https://doi.org/10.1037/0278-6133.19.5.487)
- Sheeran, P., Gollwitzer, P. M., & Bargh, J. A. (2013). Nonconscious processes and health. *Health Psychology*, 32, 460–473. doi:[10.1037/a0029203](https://doi.org/10.1037/a0029203)
- Stanley, M. A., & Maddux, J. E. (1986). Cognitive processes in health enhancement: Investigation of a combined protection motivation and self-efficacy model. *Basic and Applied Social Psychology*, 7, 101–113. doi:[10.1207/s15324834baspp0702\\_2](https://doi.org/10.1207/s15324834baspp0702_2)
- Strecher, V. J., McClure, J., Alexander, G., Chakraborty, B., Nair, V., Konkell, J., ... Pomerleau, O. (2008). The role of engagement in a tailored web-based smoking cessation program: Randomized controlled trial. *Journal of Medical Internet Research*, 10, e36. doi:[10.2196/jmir.1002](https://doi.org/10.2196/jmir.1002)
- Symbaluk, D. G., Heth, C. D., Cameron, J., & Pierce, W. D. (1997). Social modeling, monetary incentives, and pain endurance: The role of self-efficacy and pain perception. *Personality and Social Psychology Bulletin*, 23, 258–269. doi:[10.1177/0146167297233005](https://doi.org/10.1177/0146167297233005)
- Williams, D. M. (2010). Outcome expectancy and self-efficacy: Theoretical implications of an unresolved contradiction. *Personality and Social Psychology Review*, 14, 417–425. doi:[10.1177/1088868310368802](https://doi.org/10.1177/1088868310368802)
- Williams, D. M., & Evans, D. R. (2014). Current emotion research in health behaviour science. *Emotion Review*, 6, 277–287. doi:[10.1177/1754073914523052](https://doi.org/10.1177/1754073914523052)
- Wolpe, J. (1978). Self-efficacy theory and psychotherapeutic change: A square peg for a round hole. *Advances in Behaviour Research and Therapy*, 1, 231–236. Retrieved from <http://www.sciencedirect.com/science/journal/01466402>