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## The (over)use of SMART goals for physical activity promotion: A narrative review and critique

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### ABSTRACT

The SMART acronym (e.g., Specific, Measurable, Achievable, Realistic, Timebound) is a highly prominent strategy for setting physical activity goals. While it is intuitive, and its practical value has been recognised, the scientific underpinnings of the SMART acronym are less clear. Therefore, we aimed to narratively review and critically examine the scientific underpinnings of the SMART acronym and its application in physical activity promotion. Specifically, our review suggests that the SMART acronym: is not based on scientific theory; is not consistent with empirical evidence; does not consider what type of goal is set; is not applied consistently; is lacking detailed guidance; has redundancy in its criteria; is not being used as originally intended; and has a risk of potentially harmful effects. These issues are likely leading to sub-optimal outcomes, confusion, and inconsistency. Recommendations are provided to guide the field towards better practice and, ultimately, more effective goal setting interventions to help individuals become physically active.

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## Introduction

A goal is defined as what an individual is trying to accomplish – it is the aim or object of an action (Locke et al., 1981), such as to attain a specific standard of proficiency on a task (Locke & Latham, 2002). Goal-setting is one of the most commonly used behaviour-change techniques in interventions designed to increase physical activity (Howlett et al., 2019).<sup>1</sup> Furthermore, goal-setting is an effective behaviour change technique (Epton et al., 2017) that achieves substantive improvements in physical activity (McEwan et al., 2016). In assisting their clients to set appropriate goals, most public health and physical activity professionals are advised to use the "SMART" heuristic (Doran, 1981), which was first proposed as a mnemonic rule in a 965-word article published in *Management Review* by George Doran – a business consultant. In its original version, the acronym stood for Specific, Measurable, Assignable ("specify who will do it"), Realistic, and

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Time-related, but it is now commonly interpreted as the setting of Specific, Measurable, Achievable, Realistic, and Time-bound goals.

The appeal of the SMART heuristic lies in its simplicity and memorability (McPherson et al., 2014), and its broad dissemination among professionals and health organisations is testament to its apparent practicality. For example, SMART goals are recommended to practitioners by leading health organisations, such as: the National Health Service (e.g., NHS Health Trainer Handbook, Michie et al., 2008) and Moving Medicine (e.g., Workbook for an active lifestyle, 2018) in the U.K.; the American College of Sports Medicine (2017); and The Royal Australian College of General Practitioners (2018). Indeed, some policies, such as the Clinical Framework for the Delivery of Health Services (Worksafe Victoria & Transport Accident Commission, 2012) in Australia *require* that practitioners/clinicians set SMART goals with clients (e.g., in order to have treatment plans approved). The implementation of SMART goals for physical activity is also prevalent beyond professional practice. Many health organisations and government agencies, including healthdirect in Australia (<https://www.healthdirect.gov.au/goal-setting>), provide guidance to the general public to set their own SMART goals as a way of increasing physical activity.

The practicality of the SMART heuristic is widely recognised, but its scientific foundations in physical activity promotion are less well understood. Indeed, the SMART heuristic was first published over 40 years ago (Doran, 1981), and since then, research in both goal-setting and physical activity promotion has developed extensively (e.g., Locke & Latham, 2013, 2019). It is therefore important, and timely, to re-examine the scientific foundations underpinning the SMART heuristic – especially given how widely the SMART heuristic is used in physical activity promotion and how prominently it influences goal-setting practice in this field.

## Aims and Approach

The purpose of this review was to critically examine the scientific underpinnings of the SMART heuristic to: (i) address key questions relating to the use of SMART goals in physical activity promotion; (ii) help practitioners, researchers, and organisations make more informed decisions around whether to use the SMART heuristic to set goals, and what limitations to be aware of if they do choose to use it; and (iii) present a starting point for discussion, and suggestions, on how the field might move beyond its current reliance on setting SMART goals for physical activity promotion. Ultimately, we seek to ensure that goal-setting practices are up to date with the latest theory and empirical evidence, and are implemented in ways that maximise their likely effectiveness in overcoming physical inactivity.

To do so, we conducted a narrative review of the use of the SMART heuristic in physical activity promotion. Specifically, this review critically examined existing literature on goal-setting and physical activity in terms of: (i) key questions about the use of SMART goals for physical activity promotion; (ii) implications; and (iii) future directions for research, practice, and education on goal-setting in physical activity promotion. A narrative review (Ferrari, 2015; Greenhalgh et al., 2018) was considered most appropriate (e.g., compared to a systematic review and/or meta-analysis) as the focus was primarily conceptual.

To inform this narrative review, we conducted a literature search and identified 147 relevant studies. Relevant articles were retrieved (August 6th 2020) through a combination of: (i) checking forward searches for the original paper on SMART goals by Doran (1981) on Google Scholar with the terms 'exercise OR physical activity'; (ii) electronic database searches (Academic Search Complete; APA PsycARTICLES; APA PsycINFO; CINAHL Complete; MEDLINE; PubMed; Scopus; and Sports-DISCUS) with the search terms 'SMART goal\*' AND 'exer\* OR physical\* activ\*'; (see Appendix 1 in supplementary file for full electronic database searches); and (iii) checking included studies and forward citations of a meta-analysis on goal-setting in physical activity (McEwan et al., 2016) and review papers retrieved by the electronic searches. All records were screened for relevance by the second and fourth authors independently in three stages: (i) title and source; (ii) abstract; and (iii)

full text. Studies were considered relevant if they: (i) were original, empirical studies or protocol papers that referred to the implementation of SMART goals in exercise or physical activity; (ii) evaluated the use of SMART goals in physical activity promotion; or (iii) were articles that advocated the use of, or detailed programs that used, SMART goals in physical activity. The 147 identified studies (see Appendix 2 in supplementary file) were used to inform the critiques presented in the following section, using a narrative review approach (Greenhalgh et al., 2018).

## Key questions about the use of SMART goals for physical activity promotion

To guide this review, a series of questions were identified through: literature on SMART goals in other fields (e.g., rehabilitation – McPherson et al., 2014; organisational psychology – Rubin, 2002; education – Day & Tosey, 2011); recent developments in goal-setting (e.g., Locke & Latham, 2013); and common assumptions and advice provided on setting SMART goals. Combined, these questions were intended to provide a critical examination of the scientific foundations of SMART goals in physical activity promotion.

### Is the SMART heuristic based on theory?

It is often considered best practice to use theory to guide interventions in health promotion (Glanz & Rimer, 2005; Prestwich et al., 2015). While interventions based on theory are not guaranteed to succeed, they are much more likely to produce desired outcomes (Glanz & Rimer, 2005). Although some researchers, practitioners, and policy makers may believe that the SMART heuristic was based on the well-known goal-setting theory proposed by Locke and Latham (1990), it is important to clarify that this is not the case. Doran's (1981) article was unaccompanied by references to any theoretical framework or supporting empirical evidence (i.e., Doran never explicitly connected the SMART heuristic to goal-setting theory). This is in stark contrast to goal-setting theory, which is reportedly based on over 1,000 empirical studies across a broad range of tasks and settings (Locke & Latham, 2019). Locke and Latham have acknowledged the existence and potential utility of the SMART acronym, when pointing out, for example, that practitioners typically adhere to the SMART acronym when setting goals in organisational settings (Locke & Latham, 2015), and characterising SMART as a "useful technique designed to help you remember the characteristics of well-thought-out career goals" (Mealiea & Latham, 1996, p. 35). However, contrary to common impression, the SMART heuristic is not derived from goal-setting theory and has important differences compared to the postulates of Locke and Latham's theory.

One important difference is that the SMART heuristic focuses on achievable/realistic goals, whereas goal-setting theory encourages the setting of challenging/difficult goals. Goal-setting theory advocates, and distinguishes between, performance and learning goals – both of which should be specific and challenging to produce optimal results (e.g., Locke & Latham, 2013). Specific, challenging performance goals focus on the achievement of specific tasks through certain standards of proficiency (Tasa et al., 2013), with examples including to 'aim for 10,000 steps per day' or to 'increase last week's average by 1500 steps'. Specific, challenging performance goals are proposed to be appropriate when four moderators are present (commitment, feedback, ability, and resources) and work through four mechanisms (choice, effort, persistence, and cueing of existing strategies; Locke & Latham, 2013). In a conceptual review and update of the application of goal-setting theory to physical activity promotion, Swann et al. (2021) suggested that specific, challenging performance goals appear to be most theoretically appropriate for those who are already active (i.e., those for whom the four moderators of commitment, ability, knowledge, and resources are already present). Instead, according to recent developments in goal-setting theory, it now appears that specific, challenging learning goals may be most theoretically appropriate for inactive individuals (see Swann et al., 2021 for discussion).

Specific, challenging learning goals are defined as 'a desired number of strategies, processes, or procedures to be developed in order to master a task' (Locke & Latham, 2015, p. 116), with examples

such as to ‘identify three effective strategies to increase your daily step count’ (Swann et al., 2021). In terms of moderators, learning goals are appropriate when: the individual is new to a complex task or when an individual lacks the ability to perform the task (Locke & Latham, 2015; Seijts et al., 2013); learning rather than just performance motivation is required (Latham & Locke, 2006; Williams, 2013); individuals have lower cognitive ability (Latham et al., 2008); and negative feedback is given on the performance of a task that is experienced as highly complex (Locke & Latham, 2019). In terms of mediators, learning goals focus more on searching, planning, monitoring, evaluating, and generating ideas or strategies (see Swann et al., 2021). Doran (1981) mentioned neither moderators nor mechanisms when proposing SMART goals.

Put simply, the SMART heuristic is not a theory-based strategy. Therefore, it is not underpinned by a framework to generate research questions and test hypotheses, or aid explanation, prediction and control (Doherty, 2013; Prestwich et al., 2015). Furthermore, the SMART acronym does not explain how such goals are proposed to work and does not consider moderators that denote when a SMART goal is (and is not) appropriate. The SMART heuristic, therefore, should be considered less likely to be effective than interventions based on formal goal-setting theory.

### Is the SMART heuristic consistent with empirical evidence?

It is generally presumed that all elements of the SMART acronym are unambiguously supported by empirical evidence, especially in the context of physical activity. In actuality, the simplicity of SMART belies a far more complex pattern of empirical findings. The following section discusses two key issues on which the SMART acronym is not consistent with empirical evidence.

**Goals do not need to be specific to be effective.** A cornerstone of SMART goals is that goals must be specific: all studies found in our review that detailed the meaning of S ( $k = 101$ ) stated that it referred to Specific. However, a meta-analysis of goal-setting interventions in the context of physical activity found no significant difference between specific ( $k = 31$ ,  $d = 0.589$ , 95% C.I. 0.43-0.75) and vague or unclear ( $k = 21$ ,  $d = 0.511$ , 95% C.I. 0.33-0.70) goals (McEwan et al., 2016). That is, goals do not need to be specific to be effective at increasing physical activity. McEwan et al. (2016) explained that although this finding may be surprising given the common assumption that specific goals are superior to vague goals, it is actually in line with goal setting theory. For example, Latham and Locke (1991) noted that ‘trying for specific, challenging goals may actually hurt performance in certain circumstances’ such as ‘in the early stages of learning a new, complex task’ (p. 229). The majority of the samples included in the McEwan et al. (2016) meta-analysis comprised participants who were insufficiently active at baseline, meaning it is possible that vague goals were advantageous for these participants as they were in the early stages of learning to be physically active.

Furthermore, emerging research also indicates that there can be benefits to setting non-specific goals in physical activity. Non-specific goals were found to lead to at least as much (Swann et al., 2020a, 2020b), if not more (Hawkins et al., 2020) physical activity for insufficiently active adults. Collectively, this indicates that there is empirical evidence and a theoretical rationale to suggest that goals do not need to be specific to be effective at increasing physical activity, thus contesting the appropriateness of the common use of ‘Specific’ within SMART goals.

**Goals should be ‘challenging’ rather than ‘achievable’ or ‘realistic’.** According to common interpretation of the SMART acronym, goals should be Achievable or Realistic (e.g., 51% and 72% of studies reporting the meaning of A [ $k = 101$ ] and R [ $k = 100$ ] in our search reported these interpretations, respectively). However, extensive research suggests that goals should be *challenging* to produce optimal outcomes (Locke & Latham, 1990, 2013). These recommendations are based on empirical evidence collated over many decades and through various research designs and samples (Locke & Latham, 2013), including research in behaviour change (e.g., Epton et al., 2017) and physical activity. For example, Anson and Madras (2016) found that participants with high/challenging goals walked more than participants with low goals, even if they did not meet the assigned goal; Chevance et al. (2021) reported that the difficulty of performance goals was positively and

significantly associated with physical activity – that is, more challenging performance goals led to larger increases in physical activity; and Gao and Podlog (2012) found that children’s physical activity levels increased significantly more in a difficult-goal group than those in an easy-goal group. In short, achievable/realistic goals are not in line with the best available evidence and the SMART acronym is missing ‘challenging’ as a core criterion. While users of the SMART acronym may assume or interpret that goals should be challenging yet achievable/realistic, it remains the case that ‘challenging’ is not included as a SMART criterion, despite being recognised as highly important in goal-setting research. Therefore, the SMART acronym is not consistent with extensive research on goal specificity or difficulty (i.e., the Achievable, Realistic criteria), suggesting that SMART goals are unlikely to lead to optimal physical activity outcomes.

### Does the SMART heuristic consider what type of goal is set?

The SMART acronym ignores one of the most fundamental considerations in goal-setting research, namely that there are many types of goals, each of which can lead to different performance and psychological outcomes. There are over 20 types of goal, each of which can impact differently on the individual’s performance and experience (Grant, 2012). Prominent examples of goal distinctions include performance vs. learning goals in goal-setting theory (Locke & Latham, 2013) and behavioural vs. outcome goals as behaviour change techniques (e.g., Carey et al., 2019). Therefore, all goals are not equal – and each type of goal can result in different performance and psychological outcomes for an individual. However, the SMART acronym does not consider which type of goal is set, and contrasting goal types could still be ‘SMART’.

There are also a variety of other considerations essential to goal-setting that are not accounted for in the SMART acronym. For example, the SMART acronym does not address whether goals should be: positively or negatively valenced; set with normative (i.e., comparison against others) or intrapersonal (i.e., self-referenced) framing (Duda & Balaguer, 2007); or short-term (e.g., today or this week) vs. long-term (e.g., this year, or on an ongoing basis) goals. These issues suggest that the SMART acronym is likely causing those setting goals to overlook one of the most fundamental considerations in goal-setting, leading to inconsistency in the goal types set. Table 1 illustrates how two goals could both meet the SMART criteria, yet vary substantially based on these important considerations.

**Table 1.** Examples of how SMART goals are missing important additional considerations.

Example SMART goal	Evidence of SMART criteria	Additional considerations
For the week of the 1st of April, I aim to increase my daily average step count compared to the previous week	<p><b>Specific:</b> average weekly step count</p> <p><b>Measurable:</b> average daily step count in relation to previous week</p> <p><b>Achievable:</b> increase compared to previous week</p> <p><b>Realistic:</b> increase compared to previous week</p> <p><b>Timebound:</b> week of the 1st of April</p>	Positively valenced; approach; intrapersonal, short-term
By the end of the year, I aim to avoid finishing last place in my walking group for daily average step counts	<p><b>Specific:</b> placing in walking group</p> <p><b>Measurable:</b> average daily step count; placing in walking group</p> <p><b>Achievable:</b> avoid recording lowest step count</p> <p><b>Realistic:</b> avoid recording lowest step count</p> <p><b>Timebound:</b> by end of year</p>	Negatively valenced; avoidance; normative; long-term

## Is the SMART heuristic applied consistently?

Over the years, and given the absence of a link to a specific underlying theoretical framework, different authors have taken the liberty to modify what the acronym SMART stands for, to emphasise elements that each considered more relevant or important for a particular context. At present, there is no single, agreed upon, consistently applied approach to SMART goals (Levack et al., 2015), with Wade (2009) identifying over 55 possible terms that could be used as SMART criteria in rehabilitation. In the 147 studies that we identified, 34 terms were identified (see Table 2). Of equal concern is the absence of a clear definition of what SMART stands for. Only two-thirds (65.97%;  $k = 97$ ) of the 147 studies included in our review specified their interpretation of all five letters of the SMART acronym, with six studies only specifying what 2–4 letters stood for, and the remainder ( $k = 44$ ) failing to provide any details on the interpretation employed. Furthermore, two papers provided multiple interpretations of the same letters.

These definitional issues are also evident in practice, where different variations exist in how the SMART heuristic is phrased between health organisations and policies. For example, The Royal Australian College of General Practitioners (RACGP) guidelines for the implementation of prevention in general-practice settings (2018) outlines that A refers to 'assignable'; whereas the Australian Clinical Framework for the Delivery of Health Services states that A refers to 'achievable'. Similarly, the government healthdirect website (<https://www.healthdirect.gov.au/goal-setting>) states that the R refers to 'realistic', whereas the Clinical Framework for Delivery of Health Services that the R refers to 'relevant'. This inconsistency is likely to create confusion.

Authors have also introduced extensions of the SMART acronym, such as SMARTS and SMARTER. As a case in point, the American College of Sports Medicine (2017), without citing a source or supporting evidence, refers to the "SMARTS principle," with the added S referring to "self-determined" ("Goals should be developed primarily by the client/patient"). Indeed, the additional letters also acquire various definitions, such as Ethical, Enjoyable, or Evaluated as the added E in SMARTER. Rubin (2002) aptly characterised this phenomenon as "acronym drift", whereby common interpretations have strayed away from the original intentions or principles upon which the acronym was based. Indeed, this indicates that researchers believe that the SMART acronym, as it stands, is insufficient or unacceptable, and needs to be modified or extended.

## Is there sufficient detail in the SMART criteria?

A further critique is that there is insufficient detail in certain criteria, such as effective ways of setting 'timebound' SMART goals. A meta-analysis (McEwan et al., 2016) found that daily goals, such as to aim for 10,000 steps per day ( $k = 28$ ,  $d = 0.600$ , 95% CI [0.44, 0.76]), and daily-plus-weekly goals, such as to aim for 30 min of physical activity per day and at least 150 min per week ( $k = 2$ ,  $d =$

**Table 2.** SMART goal interpretations reported in studies included in the review.

SMART letter (variations)	Label (number of citing studies) <sup>1</sup>
S (1)	Specific ( $k = 101$ )
M (3)	Measurable ( $k = 99$ ), meaningful ( $k = 1$ ); manageable ( $k = 1$ )
A (8)	Achievable ( $k = 52$ ), attainable ( $k = 31$ ), acceptable ( $k = 6$ ), action-oriented ( $k = 5$ ), assignable ( $k = 3$ ), action-based ( $k = 2$ ), agreed ( $k = 1$ ), attractive ( $k = 1$ )
R (4)	Realistic ( $k = 72$ ), relevant ( $k = 27$ ), results-focused ( $k = 1$ ), recorded ( $k = 1$ )
T (18)	Time-bound ( $k = 25$ ), timely ( $k = 25$ ), time-based ( $k = 11$ ), timed ( $k = 10$ ), time-specific ( $k = 6$ ), time-framed ( $k = 5$ ), time-related ( $k = 5$ ), time time-targeted ( $k = 3$ ), time ( $k = 2$ ), time-limited ( $k = 2$ ), timeline ( $k = 1$ ), with a timeline ( $k = 1$ ), have a target date ( $k = 1$ ), time-oriented ( $k = 1$ ), sensitive ( $k = 1$ ), with a given time frame ( $k = 1$ ), with time frames ( $k = 1$ )

Notes: (1) 103 studies in our search reported information on at least two letters of the SMART acronym, but six of these studies did not report all five letters; (2) two studies reported two interpretations for some letters (Armburst et al., 2015; Rieder et al., 2018)

0.947, 95% CI [0.45, 1.45]), were effective for increasing physical activity; however, weekly goals such as 150 min of moderate-intensity physical activity per week ( $k = 7$ ,  $d = 0.152$ , 95% CI [-0.14, 0.45]) were not effective. This missing detail in the SMART heuristic could determine whether the goal is efficacious; that is, two SMART goals could be phrased almost identically, but one could be effective (based on daily or daily-plus-weekly goals), whereas the other may not (based on weekly goals only). Furthermore, there is little evidence to suggest whether ‘timebound’ goals should be set as a one-off (e.g., ‘I will aim to reach 10,000 steps today’) or on an ongoing basis (e.g., ‘I will aim to reach 10,000 steps every day’), which could also affect the efficacy of the goal. Similarly, it is difficult to pinpoint the meaning of ‘specific’. Doran’s (1981) guidance referred to ‘target a specific area for improvement’ (p. 36), but this could be interpreted in many ways in the context of physical activity, such as: increasing one’s step count; going to the gym; finishing in a certain position on a leaderboard; or parking farther away from the workplace. Therefore, important aspects of the SMART heuristic are lacking crucial details, which could negatively affect the efficacy of the goals subsequently set.

### Are all SMART criteria necessary?

Common interpretation of the SMART acronym is based on Specific (reported by 100% of studies we found), Measurable (98% of studies), Achievable (51%), Realistic (70%), and Timebound (100% of studies reported a variation relating to time) criteria. However, there is often redundancy between criteria in the SMART acronym. For example, ‘measurable’ goals are already ‘specific’, so there is little need for both terms (Levack, 2018). Similarly, the terms ‘realistic’ and ‘achievable’ arguably refer to redundant ideas. On this basis, two of the five criteria identified in common interpretation of the SMART acronym are not necessary and could create confusion for those seeking to set goals that uniquely address all criteria.

### Is the SMART heuristic being used as originally intended?

Common interpretation and application of the SMART acronym in physical activity promotion are different to that originally intended by Doran (1981). For Doran, the A referred to ‘assignable’, which differs from the interpretation of ‘achievable’ commonly found in physical activity promotion, with only three of the 147 studies we identified specifying A as ‘assignable’. Importantly, Doran (1981) originally noted that ‘the suggested acronym doesn’t mean that every objective written will have all five criteria’ (p. 36); that is, goals can be set by only selecting certain criteria depending on what is relevant. Indeed, Doran (1981) emphasised that ‘in some situations it is not realistic to attempt quantification’ (p. 36). Thus, according to the original conceptualisation, not all criteria in the SMART heuristic need to be used, and it has even been recognised that SMART goals may not be appropriate in certain circumstances at all. These considerations appear to have been forgotten or overlooked in physical activity promotion, where it appears to be almost universally assumed that all criteria must be employed, and there is often no process to check whether the SMART acronym is appropriate before use. As an example, the Clinical Framework for the Delivery of Health Services in Australia states that ‘Goals should be SMART: specific, measurable, achievable, relevant *and* timed’ (emphasis added; p. 13), and that ‘All healthcare professionals providing services ... are expected to adopt these principles’ (p. 2). That is, practitioners are required to set SMART goals in all cases, and are *expected* to adhere to all of the SMART criteria, in contrast to Doran’s original guidance.

### Are there risks in setting SMART goals?

McPherson et al. (2014) raised the question of whether SMART goals could be harmful, and there is increasing awareness in goal-setting literature that inappropriately set goals can have harmful or detrimental effects. These effects include: stress, anxiety, pressure, and threat appraisals; inhibition



of learning; unethical behaviour; and perceptions of failure (Ordóñez et al., 2009; Drach-Zahavy & Erez, 2002; Latham & Locke, 2006). There are examples of such detrimental effects within physical activity studies. Swann et al. (2020a) found that individualised SMART goals elicited significantly higher pressure/tension than open goals for healthy adults undertaking a walking task. An example of unethical behaviour was reported in China, where health insurance companies offer discounted premiums for individuals who consistently achieve certain daily step count targets. This has led to the development of electronic cradles designed to rock smartphones and 'cheat the step counter' (Morris, 2019). There is also evidence of high rates of failure to achieve physical activity goals. For example, even 'easy' physical activity goals – such as a 10% increase in one's average step count – can lead to high rates of failure (31%) in brief interventions (Moon et al., 2016). Similarly, in a three week intervention, participants who self-set a challenging yet realistic step count goal only achieved it around 50% of the time (Sidman et al., 2004).

Furthermore, emerging evidence suggests that there could be risks and adverse effects to pursuing SMART goals within physical activity. Hawkins et al. (2020) found that insufficiently active participants (relative to recommended physical activity guidelines) walked significantly further when given an open goal (to 'see how far you can walk in six minutes') compared to an individualised SMART goal (e.g., to 'walk 450 metres in six minutes'). That is, insufficiently active participants completed significantly less physical activity (i.e., distance walked) when pursuing SMART goals. Insufficiently active participants also reported significantly lower enjoyment, pleasure, perceptions of performance, and motivation when pursuing SMART goals compared to open goals (Hawkins et al., 2020). The finding that SMART goals led to significantly less pleasure during physical activity compared to open goals (Hawkins et al., 2020) is particularly important as, for example, a systematic review found that affect during exercise predicts future physical activity (Rhodes & Kates, 2015). As such, this initial evidence suggests that pursuing SMART goals could be creating less pleasurable experiences during physical activity for insufficiently active participants, which could ultimately lead to harmful consequences such as dropout. Overall, there is evidence to suggest that inappropriately set goals, including SMART goals, may have risks of inferior physical activity outcomes, as well as harmful effects on important psychological predictors of long-term engagement in physical activity.

## Summary

Despite widespread adoption, it is evident that there are many concerns and misconceptions related to the use of SMART goals for physical activity promotion. Specifically, the SMART acronym: (i) is not based on scientific theory; (ii) is not consistent with empirical evidence; (iii) does not consider what type of goal is set; (iv) is not applied consistently; (v) is lacking detailed guidance; (vi) has redundancy in its criteria; (vii) is not being used as originally intended; and (viii) has a risk of potentially harmful effects. Table 3 provides a summary and explanation of these issues. It is important for practitioners, researchers, and organisations to be aware of these issues in order to make informed decisions around whether to use the SMART heuristic in their goal-setting practice and, if it is used, what the potential risks and pitfalls may be. The following section discusses the implications of these issues for goal-setting in physical activity promotion.

## Implications

There are several important consequences and implications of the issues identified above. First, there is a risk of *sub-optimal outcomes*. McPherson et al. (2014) noted that 'Very little evidence ... exists to suggest SMART goals are the most effective strategy to enhance the goal-setting process or [improve] goal-related outcomes' (p. 107). Core properties of the SMART acronym are not in line with the best available evidence (e.g., 'achievable' and 'realistic' goals are set rather than 'challenging/difficult' goals) or have not been supported strongly by evidence in physical activity (e.g., specific goals were found to be no more effective than vague goals such as to 'be more active' –

**Table 3.** Summary of issues and misconceptions in the use of SMART goals for physical activity promotion.

	Problem	Explanation of Problem
1	The SMART heuristic is not based on scientific theory	The SMART heuristic does not explain how such goals are proposed to work, and does not consider moderators that denote when a SMART goal is (and is not) appropriate. Therefore, it is less likely to produce desired outcomes (Glanz & Rimer, 2005).
2	Aspects of the SMART heuristic are not consistent with empirical evidence	Against common understanding, physical activity goals do not need to be specific to be effective (McEwan et al., 2016), while challenging/difficult goals are typically considered to be more effective than 'Achievable' goals (Locke & Latham, 2013, 2015).
3	The SMART heuristic does not consider what type of goal is set	There are many types of goal (Grant, 2012), any of which could be stated according to the SMART heuristic, and the wrong type of goal in the wrong context can be detrimental to the individual and their attempts to achieve the desired behaviour (Latham & Locke, 2006; Ordóñez et al., 2009).
4	The SMART heuristic is not applied consistently	There is no single, agreed, consistently-applied approach to SMART goals (Levack et al., 2015; Wade, 2009). Over 34 terms were identified in this review, for example, R can stand for realistic, relevant, results-focused, or recorded, while A can stand for action-oriented, assignable, attainable, or achievable
5	There is insufficient detail in the SMART criteria	For example, there is little guidance around optimal timeframes when setting goals. Daily, and daily plus weekly, goals were found to be effective for increasing physical activity, but weekly goals were not (McEwan et al., 2016).
6	There is redundancy/repetition in the SMART criteria	Some commonly-used criteria stand for the same things, such as 'achievable' and 'realistic', and 'specific' and 'measurable' and therefore do not need to be stated twice (Levack, 2018)
7	The SMART heuristic is not being used as originally intended	It is typically assumed that all aspects of the SMART acronym should be incorporated into a physical activity goal, however Doran (1981) originally stated that: 'it should also be understood that the suggested acronym doesn't mean every objective will have all five criteria' (p.36).
8	SMART goals have potentially harmful effects for insufficiently active individuals	Studies have found SMART goals can lead to inferior and potentially detrimental outcomes for insufficiently active participants, including significantly less physical activity, enjoyment, pleasure, motivation, and perceptions of performance, as well as significantly greater pressure/tension (Hawkins et al., 2020; Swann et al., 2020a).

McEwan et al., 2016). Therefore, interventions based on SMART goals do not appear to provide insufficiently active individuals with best-practice goal setting support, which risks sub-optimal outcomes.

Second, and relatedly, there is a risk of *research waste* where funding is awarded to research based on SMART goals – despite limited evidence that SMART goals are more effective than other goal-setting approaches (McPherson et al., 2014). That is, where funding is being invested into research incorporating SMART goals, it is important for funders to know that this strategy lacks evidence of comparative efficacy, and they are likely investing in programs that are not as effective, or cost-effective, as they could be.

Third, there is a risk of *detrimental outcomes* for individuals. Setting an inappropriate type of goal can have detrimental effects on attempts to achieve the desired behaviour, depending on theory-specified contextual and other moderating factors (e.g., knowledge, commitment, ability, or available resources – Latham & Locke, 2006). Goal-setting research has identified that such detrimental effects can include: reduced efficacy; perceptions of failure; stress, anxiety and threat appraisals; and unethical behaviour (Latham & Locke, 2006; Ordóñez et al., 2009). As noted above, there are examples of these detrimental effects within physical activity, including: reduced efficacy (e.g., McEwan et al., 2016 who found that specific goals were no more effective than vague goals such as to 'be more active'); high rates of failure to achieve physical activity goals (Moon et al., 2016; Sidman et al., 2004); increased pressure/tension arising from individualised SMART goals (Swann et al., 2020a); and unethical behaviour such as 'cheating' in pursuit of physical activity targets (e.g., Morris, 2019).

Fourth, the current approach is *undermining the evidence base* on SMART goals for physical activity promotion because of inconsistent application, which is leading to difficulty in synthesising outcomes. This means that it is difficult to assess the efficacy of SMART goals or synthesise the outcomes of research to date. Without appropriate research synthesis, it would be difficult to build confidence in the use of SMART goals.

Fifth, there is a risk that a narrow focus on SMART – by encouraging (e.g., Moving Medicine, ACSM, RACGP) or requiring (e.g., Clinical Framework for the Delivery of Health Services) the use of SMART goals – may *constrain practitioners' use of other goal-setting approaches*. That is, even if practitioners are equipped with other evidence-based approaches, or question the efficacy of SMART goals (e.g., based on observing suboptimal outcomes), they may not be able to use alternatives due to policy requirements. In combination, there may be potential risks and implications associated with the use of SMART goals that need to be considered carefully when deciding whether to use this heuristic. The following section considers how the field might alleviate/avoid these risks and move beyond the current overreliance on SMART goals for physical activity promotion. These considerations ensure that goal-setting practices are up to date with the latest theory and empirical research, and maximise likely effectiveness.

## Moving forward

Given the current reliance on SMART goals for physical activity promotion, and the issues identified in this review, we suggest that more sophisticated, defensible, and evidence-based (yet equally as practical) guidance on goal-setting is needed in physical activity promotion. This conclusion is in line with the perspective taken by other fields, such as goal-setting in rehabilitation, which has raised critiques of SMART goals since 2009 (Playford et al., 2009; Wade, 2009). Researchers on goal-setting in rehabilitation reflected that:

For a time, goal-setting was, arguably, viewed as a rather simple but effective [strategy] ... Since 2000, there has been a dramatic growth in our application of some of the complexities surrounding the application of goal-setting ... [including] increasing recognition that an atheoretical approach to goal-setting had proliferated and that current approaches to clinical practice do not always match goal theory or have yet to be substantiated in rehabilitation contexts (Siegert & Levack, 2014, pp. 377–378).

Similar issues are now also apparent in physical activity promotion through overreliance on the SMART acronym. The following sections draw upon principles proposed in the rehabilitation literature to provide suggestions on how physical activity promotion may move forward in light of the issues identified in this review.

## Prioritise theory-based goal-setting

Interventions to change health-related behaviours will have a greater chance of effectiveness if they are grounded in appropriate theory (Carey et al., 2019; Glanz & Rimer, 2005). Indeed, theory-based interventions are proposed to be a key element in the development of a more sophisticated approach to goal-setting (Siegert & Levack, 2014). As noted above, the SMART acronym is not based on a particular theory. Therefore, a key recommendation moving forward is that researchers, practitioners and organisations prioritise theory-based goal-setting interventions.<sup>2</sup> Theories relevant to goal-setting include: goal-setting theory; achievement goal theory; self-regulation theory; self-determination theory; and social cognitive theory (see Pritchard-Wiart et al., 2019 for a review and comparison).

As an example, the process for setting goals in line with Locke and Latham's (2013) goal-setting theory should involve an initial assessment of necessary moderators: commitment, knowledge, resources, and ability. If all of these moderators are present, a specific, challenging performance goal should be set (e.g., to reach 10,000 steps per day), with careful checking to ensure that the goal is perceived to be challenging/difficult by the individual. If any of these moderators are not

present, then a specific, challenging learning goal (e.g., to identify and implement five ways to increase your daily step count) should be set; again with careful checking to ensure that the goal is perceived to be challenging/difficult by the individual (i.e., in terms of the number of strategies the individual needs to identify and implement). If a learning goal is set, the moderators should be monitored, and once commitment, knowledge, resources, and ability are developed, then specific, challenging performance goals should be set instead (see Locke & Latham, 2013 for an overview of goal-setting theory, and Swann et al., 2021 for a review of the application of goal-setting theory in physical activity).

By drawing upon relevant theory, goal-setting research and practice will be underpinned by an appropriate framework to: aid explanation, prediction and control; generate research questions and test hypotheses; help consider the circumstances in which particular goals are – and are not – appropriate; and explain how those goals are proposed to work (Doherty, 2013; Prestwich et al., 2015). This perspective is consistent with the extensive literature on behaviour change theories and techniques of behaviour change: identifying a theoretical basis for an intervention guides the choice of behaviour change techniques, and is likely to be more effective (e.g., McPherson et al., 2014). As such, theory-based goal-setting is important moving forward, and is likely to be more effective at increasing physical activity. Compared to the SMART acronym, guidance grounded in theory is more likely to be informative for practitioners, and likely to result in more effective goal-setting with better physical activity outcomes for inactive individuals.

### Embrace diverse approaches to goal-Setting

It is often assumed that the SMART heuristic is the best, or only, approach to goal-setting. However, the science of goal-setting is robust with many evidence-based approaches (including the theories noted above). Therefore, a second important recommendation is for organisations and practitioners to embrace a more diverse range of goal-setting perspectives beyond just the SMART heuristic. As discussed, it is important to think carefully, and critically, about whether to use the SMART heuristic to set physical activity goals and, if so, to be aware of its limitations, risks and pitfalls. Otherwise, we suggest that other – ideally theory-based – approaches should be considered instead. Given the reliance on SMART goals for physical activity promotion at present, it is important for researchers to communicate the diverse array of relevant theories to organisations and practitioners to help them make informed decisions about the other options available. This step will also help organisations and practitioners to distinguish between these approaches to determine which is best for their clients/patients (Siegert & Levack, 2014). By doing so, there will be greater opportunities to be adaptive and responsive to the needs of those receiving the goal-setting advice.

Similarly, educational providers (e.g., universities), accrediting bodies, and health organisations should focus on providing contemporary goal-setting guidance to students and practitioners which is grounded in scientific theory and up to date empirical evidence. Such training should focus on teaching relevant theories and frameworks of goal-setting. Consequently, practitioners with a robust and diverse understanding of goal-setting theories will be better positioned to know what type(s) of physical activity goals will likely be most effective, for whom, and in which situations. Critically, the SMART acronym should not be taught alone, or instead of theory, and goal-setting education should highlight the limitations of the SMART acronym in an effort to move beyond uncritical acceptance of this strategy.

### More critical research

Research is needed to generate evidence for the most effective goal-setting approaches in physical activity promotion. Indeed, the first priority should be developing evidence of comparative efficacy (e.g., what is the most efficacious approach to setting goals for insufficiently active individuals?), so that we can *then* focus on communicating this sophisticated approach in a meaningful and practical

way (Rubin, 2002). Based on this review, a priority is research that compares the effects of relevant goal types to empirically establish which approach is the most beneficial for promoting physical activity. In our search, only three (Hawkins et al., 2020; Swann et al., 2020a, 2020b) empirical studies compared SMART goals against another goal type. It is also important for researchers to compare the effects of goal types on both physical activity (e.g., increased step counts) and psychological outcomes underpinning adherence and long-term engagement (such as affect, enjoyment, self-efficacy, and intrinsic motivation).

If the SMART heuristic continues to be used in physical activity promotion, then researchers should aim to address issues identified in this review. In line with the experimental medicine approach (c.f. Sheeran et al., 2017), we suggest that a series of experimental studies to rigorously test whether or not SMART goals are superior to other goal types will be most useful. Such experiments should focus on key issues such as: comparing the efficacy of SMART goals versus theory-based goal-setting; examining which type(s) of goal are most beneficial for increasing physical activity in individuals who are inactive; and examining the psychological outcomes of various goal types and their impact on adherence and long-term engagement in physical activity. Researchers should also examine the potential risks and detrimental effects of SMART goals within physical activity, including outcomes such as reduced enjoyment, increased pressure, and perceptions of failure (e.g., Hawkins et al., 2020). Furthermore, researchers should compare the SMART heuristic in relation to theory-based goal-setting in order to empirically test whether or not it achieves comparable outcomes. In short, after decades of uncritically accepting and relying upon the SMART acronym, it is now time to be critical.

### The need to focus on generating strong evidence rather than new acronyms

Finally, it may be intuitive to seek a different acronym to replace SMART goals in the first instance (i.e., to replace one acronym with another). However, we caution that this would likely reinforce many of the same problematic assumptions as highlighted in this review. For example, various alternatives and extensions to the SMART acronym have been proposed, including RUMBA (Relevant, Understandable, Measurable, Behavioural, Achievable – Barnett, 1999), MEANING (Meaning, Engage, Anchor, Negotiate, Intention-implementation gap, New goals, Goals as behaviour change – McPherson et al., 2014) SMART-EST (Specific, Measurable, Attainable, Relevant, Timebound, Evidence-based, Strategic, Tailored – White et al., 2020). However, similar issues apply, such as advocating style-over-substance, reductionism/over-simplification, and assuming *one* approach to goal-setting. It should be remembered that the purpose of acronyms is to simplify and convey complex information, and like Rubin (2002) we: ‘fully support tools that increase our ability to communicate complexity in a meaningful and useful way; however, when the tool becomes the practice, and the thinking behind it wanes, this is anything but smart’ (p.27). As such, we recommend that, in the first instance, efforts are focused on establishing strong evidence for the optimal approaches to goal-setting for promoting physical activity, rather than on developing new heuristics/acronyms to replace SMART.

### Summary

Ultimately we suggest that physical activity promotion should move away from its current overreliance on SMART goals. Indeed, Grant (2012) argued that ‘the widespread belief that goals are synonymous with SMART action plans has done much to stifle the development of a more sophisticated understanding and use of goal theory’ (p.147). Rather than the uncritical acceptance that has taken place previously, we call on international scientific and professional organisations in the fields of public health and physical activity promotion to cease their wholesale, uncritical dissemination of the SMART acronym. Instead, we encourage the use of theory-based goal-setting, more critical research, a focus on generating strong evidence rather than new acronyms, and embracing more diverse goal setting approaches, with more sophisticated training for students and practitioners.

## Conclusion

The purpose of acronyms/mnemonics such as SMART is to communicate extensive research and complex information in a simple, comprehensible and memorable manner. However, ‘the use of such mnemonics without a clear understanding of the deeper underpinning knowledge may well result in ill-informed decision making, and the cultivation of inaccurate practice doctrines and mythologies about goals and goal theory’ (Grant, 2012, p. 147). As goal-setting is one of the most-used strategies for physical activity promotion (e.g., Howlett et al., 2019), it is imperative that goals are set with the best chance of helping individuals achieve sustained physical activity behaviour change. Our review indicates that there are a number of issues in the SMART heuristic which are important for practitioners, organisations and researchers to consider in deciding whether to utilise it. Indeed, the problems identified above (see Table 3) suggest that the SMART acronym – and the physical activity research, policy and practice in which SMART goals are used – is based on problematic scientific foundations. Given how commonly accepted SMART goals are in this domain and how widely they are utilised, there is a risk that these problems may be occurring on a large scale. Therefore, 40 years after its advent, we are calling on international scientific and professional organisations in the fields of public health and physical activity promotion to cease the wholesale, uncritical dissemination of the SMART acronym, in favour of more sophisticated, defensible, and evidence-based guidance on goal-setting. By working towards better goal-setting practice, these fields may be able to achieve greater increases in physical activity, on a large scale, at low cost and within existing infrastructure (Swann & Rosenbaum, 2018).

## Notes

1. Researchers suggest that successful goal pursuit involves two sequential tasks: goal setting and goal implementation (e.g., Oettingen & Gollwitzer, 2010). This review focuses on the SMART heuristic as a strategy for goal setting. It should be acknowledged, however, that there is extensive research on strategies for goal implementation, such as implementation intentions (e.g., Gollwitzer & Sheeran, 2006). While SMART goals and implementation intentions may be complementary (see Bailey, 2019), research on implementation intentions is not included in this review as our focus is on the task of goal setting rather than goal implementation.
2. Where other promising approaches are identified, such as process goals (Kingston & Hardy, 1997) and open goals (Hawkins et al., 2020; Swann et al., 2020a), efforts should be made to either develop explanatory theory or integrate them into and/or compare them with existing theory.

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Note: references for studies found in our literature search are presented in Appendix 1 in the supplementary file.

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