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Social Cognitive Approaches to Health Issues

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Social cognition and health psychology are, in many ways, an odd couple. Social cognition is concerned with general processes and causal explanations. As such, it has tended to be exploratory, looking for the increasingly novel and counter-intuitive processes involved in perceiving, attending to, remembering, thinking about, and making sense of people, objects, events, and ourselves. By contrast, health psychology has tended to focus on specific phenomena tied to practical issues of physical, mental, and social well-being, which tend to be of concern to scholars, practitioners, and lay people. In terms of the contrast, Taylor (1982) noted that the fascinating qualities of social cognitive research may not be appreciated by a large audience, compared to the broad appeal of the specific issues of concern to health psychology.

There is a group of scholars and practitioners that work at the crossroads of these two domains, using social cognitive theories to benefit the physical, mental, and social health of individuals and communities. Although they may not explicitly identify as such, they are, at least in part, applying social psychology to health. This chapter aims to review applied research focusing on social cognitive approaches to health issues, with an emphasis on interventions aimed at cognitive and behavioural change. Although this mission statement may appear narrowly focused, the body of relevant literature is impressive.

Our chapter, which is not an exhaustive review, is divided into four key sections. In the first section, we provide a brief overview of the context in which social cognition merges with health psychology. In the second section, we review social cognitive theories commonly used in health research. In the third section, we focus on the use of social cognitive theories in interventions to encourage health-related changes. In the fourth section, we discuss challenges associated with research and interventions drawing on social cognition to foster health change.

Overview of Social Cognitive Approaches to Health Issues

Broadly speaking, social cognition is concerned with the processes involved when people think about, and make sense of, the world around them. Specifically, these cognitive processes involve attending to (and/or selecting) information about, interpreting information about, making decisions about (judging), and storing and retrieving information about people and ourselves, as well as objects, states, and events (see Moskowitz, 2005). For the most part, these processes have been assumed to vary on a continuum. At one end are processes that primarily aim to systematically consider information, typically at the expense of mental energy. At the other end are processes that primarily focus on conserving mental energy, at the expense of the systematic consideration of information. Among these energy-saving strategies, relying on socially learned expectations (e.g., schemas, categories, behavioural scripts, expected outcomes) and cognitive 'shortcuts' (e.g., availability heuristics, confirmation bias), are some of the most commonly researched and reported. At the route of social cognitive approaches is the assumption that these processes are key to understanding the influence of macro and meso level factors on individuals at the micro level.

Health behaviour research crosses multiple disciplines. When applied to health issues, social cognitive approaches are typically concerned with social cognition as it pertains to the understanding of practical issues related to physical, mental, and social health and wellbeing. As such, social cognitive approaches tend to examine health-related phenomena at an individual level, focusing on intra-personal factors and their interaction with perceptions of the social environment. The emphasis on micro level factors, namely social cognitive processes, is a distinctive feature of these approaches when applied to health.

This distinctive feature is reflected in the common methods used by research in this area. Indeed, typically, knowledge has been generated by using studies with relatively small sample sizes that often rely on correlational or experimental designs. In such studies, the unit of analysis is generally a person or a person's response at one or multiple time points. The emphasis on processes is also reflected in the common

applications of the knowledge generated to address health-related issues. For example, the approaches can offer insight into the specific element of an intervention to influence individual decision-making and behaviour (e.g., Rothman and Salovey, 1997).

This approach can be contrasted with others used in the context of health research, such as public health, which tend to examine health-related phenomena using multi-level approaches, combining macro, meso, and micro factors. They also tend to rely on much larger samples, in which the unit of analysis is sometimes a person but will also often include other factors such as institutions, jurisdictions, and organizations. The contrast is also reflected in the application of knowledge. The distinctive contribution of social cognitive approaches is often less amenable to tackling health-related societal problems at multiple levels when compared to other disciplines that study health-related societal problems.

The distinctive features are well-illustrated in the prevalent social cognitive theories applied to understand health, but perhaps even more so in the attention given to the emphasis on the use of theory to explain the social cognitive processes assumed to underlie health-related behaviours. Trying to explain 'why people act that way' allows for unique novel contributions in this area of research. A good example of such a contribution comes from the work of Shelley Taylor. One of her seminal articles reports on a study conducted with cancer patients (Taylor, 1982) and revealed how the application of social cognitive theories can provide insight in health issues. Specifically, it provided insight into how different attributions of the causes of breast cancer can provide a helpful sense of psychological control. As she illustrates by her focus on the theoretical implications of her work, the role of theory is highly valued from a social cognitive perspective.

Researchers who have embarked in work at the junction between social cognition and health are often faced with a careful balancing act between the universalist assumptions of social cognitive theories and the specifics of the health issues they are examining. As applied scholars and practitioners know, rarely will one theory be sufficient to understand the complexity of a specific behaviour. At the same time, most of applied social psychology is guided by Lewin's often quoted take on theory: 'there is nothing as practical as a good theory' (1943: 118). Because of the emphasis on theory from a social cognitive perspective, we opted to structure this chapter in some ways by theoretical approach.

Social Cognitive Theories Commonly Applied in Health Contexts

Multiple reviews of the literature have examined the cognitive and behavioural theories that are commonly used in the context of health research (e.g., Armitage and Conner, 2000; Noar, 2005), including one focusing on interventions (Davis et al., 2015). For the most part, these reviews converge to suggest that the most frequently used theories in the context of health research are the Health Belief Model (HBM; Becker, 1974), Theories of Reasoned Action (TRA; Fishbein and Ajzen, 1975) and Planned Behaviour (TPB; Ajzen, 1991), Social Cognitive Theory (SCT; Bandura, 1986), and the Transtheoretical Model of Change (TTM; Prochaska and DiClemente, 1984). Of these, all but the TTM have clear roots in social cognitive principles – as its name implies, the TTM was not meant to be rooted in any one single theoretical perspective.

While the assumptions and propositions of these theories vary greatly, they do share some similarities. For the most part, social cognitive theories applied to health phenomena tend to assume that health-related actions are the result of rational decision-making processes that involve the deliberate and systematic processing of information. The commonality of this assumption reflects their common roots in expectancy-value theories, such as proposed by Lewin and his colleagues (e.g., Lewin et al., 1944). These theories suggest that the likelihood a behaviour will occur depends on the sum total of the product of the expectancy and value of the outcome(s) of the behaviour (see Feather, 1982).

These theories also hold that social cognitions are the primary causal agent of health-related actions. Although they use distinct terminology for these cognitions, most of these theories suggest that attitudinal beliefs of individuals, social norms, a sense of efficacy and control, and intentions to engage in actions play an important role in the health-related behaviours that people engage in. Overall, they also hold that these cognitions are accessible to awareness and that they tend to operate through conscious processes. Guided by these notions, these theories typically suggest that individuals enact actions that appear rational to them at the moment they are performed. However, decades of research and campaigns focusing on cognitions such

as fear-appeals, risk perceptions, and attitudes suggest that the link between our cognitions and our actions is not as direct or seemingly rational as one would assume.

In order to address this lack of concordance, other social cognitive theories have been elaborated. These approaches draw on both social cognition research and early work on fear appeals that showed counter-intuitive patterns of behaviour when people are made to fear certain health outcomes. For instance, Gollwitzer's Implementation Intentions (IIs, see Gollwitzer, 1999) offers one such alternative to a purely rational approach by focusing on action control strategies that aim to ensure that 'good intentions' get translated into actual behaviour. Social norm approaches generally offer another alternative. For example, norms-based research has shown that people often act in ways similar to others, even when faced with information suggesting that they should not, and that they also typically underestimate the influence of norms on their actions (see Cialdini, 2005; Miller and Prentice, 2016). Finally, cognitive dissonance is often discussed in the literature as a counterpoint to the argument that people are rational actors.

In this section, we review applied social cognitive work tied to the HBM, SCT, TPB, IIs, Social Norm approaches, and cognitive dissonance. However, we do not discuss the TTM. The importance of this approach for understanding the process of health behaviour change is well established. However, our focus in the current chapter is on social cognitive theories and the TTM offers limited explanations of the social cognitive processes assumed to underlie each of the steps (cf., Armitage and Conner, 2000). Protection Motivation Theory, which is also a common theory, is discussed later in the section reviewing social cognitive models developed specifically to explain health attitude and behaviour change.

Health Belief Model

A focus on health attitudes was first introduced by the HBM (Janz and Becker, 1984). The HBM was developed by US Public Health Service social psychologists in the 1950s to help understand why people do, or do not, take action to prevent, detect, or control illness. The overall premises of the model are that people have a desire to avoid illness, and to get well when ill, and that they have concordant beliefs that certain actions will either prevent illness or improve an existing condition (Janz and Becker, 1984). As such, the HBM assumes that people are rational beings who will favour being healthy and avoid illness, and will act accordingly.

The model relies on a series of four central sets of cognitions related to illness (Janz and Becker, 1984). Perceived susceptibility refers to a person's perception of the risk of acquiring a health-related condition. Perceived severity refers to perceptions of how serious a condition would be if it were acquired, or of how serious it is if the person already has it. Perceived benefits are the extent to which a person believes that a health-promoting behaviour will be effective in preventing or controlling a health condition. Finally, perceived barriers refer to obstacles or costs associated with following through with a health-promoting behaviour. Thus, according to the HBM, people are more likely to engage in health behaviours if they believe they are susceptible to a health condition, if they believe the condition could have serious consequences for their health, and if they believe a course of action with health benefits and few obstacles is available to them.

Outside of these four major dimensions of the HBM are minor factors that have generally received less attention by researchers. Cues to action refer to stimuli that trigger the health-related decision-making process; these cues could be internal (e.g., physical symptoms) or external (e.g., mass media communication). Modifying variables are generally socioeconomic factors that can affect perceptions of the four main dimensions. Lastly, self-efficacy was added to the HBM in 1988 in response to the recognition of its important role in motivating health-related actions (Rosenstock et al., 1988). In the HBM, self-efficacy typically refers to someone's confidence in their ability to perform a health behaviour successfully.

The HBM has been used for a wide variety of behaviours (see Abraham and Sheeran, 2005). For instance, smoking, prescription drug taking, cancer screening, condom use, continuous positive airway pressure therapy (CPAP), and exercise have all been investigated using the HBM (see Carpenter, 2010, and Janz and Becker, 1984, for reviews).

Overall meta-analyses have reported small effect sizes for the four main individual factors of the HBM. For

example, Harrison et al. (1992) observed that, while most of the factors were significantly associated with behavioural outcomes retrospectively and prospectively, the effect sizes were relatively small; susceptibility had an estimated correlation of $r = .15$, severity $r = .08$, benefits $r = .13$, and costs $r = .21$. Perceived benefits and costs performed better in retrospective studies than in prospective studies, raising the issue that perhaps these factors are less useful in predicting behaviour than they are in explaining it post hoc (Harrison et al., 1992).

The findings of Harrison and colleagues were replicated by Carpenter (2010), who reports that severity and susceptibility had small weighted correlations, with estimated correlations of $.15$ and $.05$, respectively. Benefits and barriers were more strongly correlated with behaviour, with estimated weighted correlations of $.27$ and $.30$, respectively. A meta-analysis by Sheeran et al. (2014) focused on experimental work that examined the effect of perceived severity yielded results that aligned with previous findings, suggesting that perceived severity had a small effect size on intentions ($d = .32$) and behaviour ($d = .34$).

It is worth noting that the effect of each of the factors was considered in isolation from each other. It is possible that there are interactions between these sets of cognitions, and that the effect of the model would be larger than that which would be expected based on the effect size of each of the factors. For example, it could be that people need to first perceive they are susceptible to a condition with severe outcomes to motivate them to look for accessible health-promoting behaviours. Unfortunately, there is no standard method of combining the factors, and therefore, not enough research has been done on combined models to warrant their inclusion in a meta-analysis. It is also possible that the factors are sharing variance, meaning that a combined model would explain less variance than the sum of each of the factors' variance. It is also worth noting that, since the HBM includes four sets of cognitions, examining their interactions may present unique challenges; analyses could require a four-way interaction.

Finally, the support for the causal role of the HBM factors is mixed. Most research assessing the HBM involves correlational designs, often cross-sectional in nature, and there are inherent challenges to these designs when examining causality. We did not find any large body of research that has examined the HBM systematically by manipulating all its proposed sets of cognitions. Future work examining the HBM using randomized control studies, particularly if blind or possibly double blind, to examine the effect of the factors on health behaviours would provide valuable information about the value of this model in applied settings.

The reputation of the HBM is also affected by its link to adverse effects and to misuse by industry to support practices that encourage unhealthy behaviours. For example, Balbach et al. (2006) review how tobacco industry executives used the focus on individual rational choice of the HBM to shift the blame from their companies onto the consumers. This argument was possible because HBM-based research gives little attention to sociostructural forces. Specifically, research derived from the HBM approach failed to systematically recognize the role of industry in framing information about smoking and health.

In sum, the HBM is one of the original models used in order to understand health decisions. The components of the model have been widely studied to help explain a range of health behaviours. Current findings suggest that individual components of the model are linked to health-related intentions and behaviours, typically with small effect sizes (cf., Cohen, 1992). The studies have relied primarily on correlational designs and examined the components of the model individually. Therefore, experimental research designs would help understand what causal role the factors of the HBM have in people's health decisions. The examination of the interaction of the factors of the HBM may also help further understand the model.

Social Cognitive Theory

SCT (Bandura, 1986) addresses both sociostructural and personal determinants of behaviour. The theory has been used to explain multiple domains of human thoughts and behaviour, including health. The theory assumes that people are agentic thinkers and, as with other social cognitive approaches, that their thoughts serve determinative functions. It argues that people engage in a dynamic construction of thoughts about future courses of action in response to changing situational demands. People assess the functional value and efficacy of these courses of actions based on their expected outcomes and make the necessary changes. These processes are set in an interactive triadic reciprocal causation framework: behavioural patterns,

environmental events, and internal cognitive, affective, and biological states are assumed to operate as interacting determinants of human behaviour.

Other factors in the model include collective efficacy, which is typically defined in terms of perceptions that a group can bring about a desired outcome, and environmental determinants of behaviour. The latter includes incentive motivation (punishments and rewards) and facilitation (resources and environmental supports). Collectively, these factors are seen as influencing goals and behaviour (Bandura, 2004).

Health researchers have typically focused on two factors of SCT that influence the likelihood that a person will take a health-related course of action: expected outcomes and self-efficacy. As defined by Bandura (1977: 193), an outcome expectancy is 'a person's estimate that a given behaviour will lead to certain outcomes'. Thus, a person must first expect that the benefits of performing a course of action outweigh the costs of doing so (i.e., physical, social, and self-evaluative outcome expectations). Bandura (1977) argued that the outcomes expected from a course of action are largely dependent on people's perception of how successful they will be in performing specific actions in specific contexts. Thus, Bandura originally argued that self-efficacy had a causal impact on expected outcomes but that expected outcomes did not have a causal effect on self-efficacy. This original notion has been questioned by researchers, and it is currently often assumed that the causal relationship between expected outcomes and self-efficacy is bidirectional (see Williams, 2010).

SCT, in particular expected outcomes and self-efficacy, has been applied to many health behaviours, such as prescription drug adherence, physical exercise, risky sexual behaviours, medical screening, and addictive behaviours (see Bandura, 1998; Luszczynska and Schwarzer, 2005). In one study, for example, patients who had been hospitalized for an acute myocardial infarction were assigned to an SCT-based treatment programme (DeBusk et al., 1994). The treatment programme supplemented usual care with activities aimed at increasing patients' sense of self-efficacy, such as monitoring. Those in the SCT group were more likely to quit smoking, had lower LDL cholesterol, and improved functional capacity compared to the control group.

A meta-analysis of 54 studies that examined the influence of self-efficacy on smoking cessation reported small effect sizes when self-efficacy was assessed prior to quitting (Cohen's $d = -0.17$; Gwaltney et al., 2009). The same study reported that, when self-efficacy was assessed after a quitting attempt, the effect was larger (Cohen's $d = -0.37$). Sheeran and colleagues (2016) conducted a meta-analysis examining the impact of experimentally manipulated self-efficacy on a range of health outcomes. Their results revealed medium effect size self-efficacy on health-related behavioural intentions (Cohen's $d = 0.51$) and a smaller effect for health-related behaviour (Cohen's $d = 0.47$).

Other studies have tended to focus exclusively on the expected outcomes components of SCT. For example, Hull and Bond (1986) conducted a meta-analysis examining the influence of alcohol outcome expectancies on consumption and reported a large effect ($Z = 5.10$). In a more recent meta-analysis, Reich et al. (2010) examined the effect of implicit and explicit alcohol outcome expectancies. They observed a small to medium effect between implicit measures of expectancies and alcohol consumption ($r = .35$), and, in line with Bond and Hull, they observed a large effect between explicit expectancies and alcohol consumption ($r = .41$).

SCT does share many points with other social cognitive theories commonly used in the context of health. For instance, it holds, as a central tenet, that cognitions are a primary causal determinant of behaviour. Also, most social cognitive models now include the notion of self-efficacy, or a version of it. For example, as we discuss further in the TPB section, the concept of perceived behavioural control in that theory is akin to the concept of self-efficacy. There are some notable differences, however. One important difference between the HBM and SCT is SCT's treatment of self-efficacy. Whereas self-efficacy is a somewhat tangential concept in the HBM, it is central to SCT. In SCT, self-efficacy is assumed to have a direct effect on health behaviours and indirect effects through its influence on outcome expectations, sociostructural factors, and goals (Bandura, 2004).

Another major difference from the HBM, and other theories including the TPB, is SCT's fundamental assumption that the relationship between a person, their behaviour, and their environment is reciprocal – the person is altered by the environment but also can alter it and elicit particular responses from it (Bandura, 1986; 2004). As part of this reciprocal relationship, SCT recognizes that groups of people can alter the

environment in order to alter behaviour. For example, groups of people working for public health agencies use the media to encourage people to reduce smoking or increase healthy eating.

There may also be more useful aspects of SCT, in terms of applications to health, than those researchers have tended to focus on – namely self-efficacy and expect outcomes (see Bandura, 1998; 2004). In particular, the theory asks researchers and practitioners to consider perceived and actual sociostructural factors that may set barriers to healthy practices, as well as the interactions between these personal and sociostructural factors. In this, SCT aims to cut across levels (micro, meso, and macro) to understand how social cognitive processes shape human behaviour dynamically.

In sum, SCT holds that people form beliefs about behaviours and their likely outcomes in response to their changing social environment. The theory has some similarities with the other theories reviewed, but its focus on self-efficacy is an important distinguishing factor. Self-efficacy has generally been shown to have a medium effect size on intentions and a smaller effect size on behaviour (e.g., Gwaltney et al., 2009). The research on SCT has been somewhat focused on the micro, individual level; future research may benefit from investigating the theory across the meso and macro levels as well.

Theory of Planned Behaviour

The TRA (Fishbein and Ajzen, 1975) and TPB (Ajzen, 1991) departed from previous theories by proposing that intentions are the most proximal determinant of behaviour. The models propose that the intention to perform a behaviour is shaped by two conceptually independent components: an attitudinal component and a normative component, which are assumed to have additive effects on behavioural intentions. The attitudinal component reflects the favourableness of the evaluation of the behaviour. On the basis of an expectancy-value approach to attitudes, Fishbein and Ajzen (1975) proposed that people's expectations about the consequences of behaviour were weighted by the importance or value placed on these consequences, and this combination shaped attitudes. The normative component of the model, termed subjective norm, refers to people's perception of the extent to which others who are important to them expect them to engage, or not engage, in a behaviour.

Ajzen (1991) revised the TRA and introduced the TPB. The TPB proposes that, to account for nonvolitional behaviours accurately, it is necessary to consider the extent to which individuals perceive the behaviours to be under their personal control. This third determinant of intentions is called perceived behavioural control.

In a meta-analysis of studies drawing on the TPB, Armitage and Conner (2001) observed that the factors posited by the theory accounted for 39% of variance in behavioural intentions and 27% of variance in behaviour. In line with past reviews (e.g., Ajzen, 1991; Sheppard et al., 1988), they also observed that the subjective norm construct is generally the weakest predictor of intentions.

McEachan et al. (2011) conducted a more specific meta-analysis focusing exclusively on prospective studies targeting health-related behaviours. Their results illustrated that the predictive validity of TPB varied by type of health behaviour. Physical activity and diet behaviours were better predicted (23.9% and 21.2% variance explained, respectively) than risky behaviours, detection behaviours, safer sex, and abstinence from drugs, which were more poorly predicted (between 13.8% and 15.3% variance explained). Intentions accounted for the most variance in behaviour across behaviour types. Attitudes were the strongest predictor of intentions for all types of behaviour, with the exceptions of risk behaviours, for which they were equal to perceived behavioural control, and detection behaviours, for which perceived behavioural control was the strongest predictor. As with previous meta-analyses, McEachan et al. (2011) observed that subjective norms were generally the weakest predictor.

The lack of predictive value of subjective norms has been attributed, at least in part, to a combination of issues of conceptualization and measurement. Subjective norms are conceptualized in terms of social pressure applied globally on a person's motivation. However, the relevance of different groups to a behaviour may vary as a function of context. For example, norms about alcohol consumption for a university student on a campus are more likely to be shaped by their peers and friends on campus, while norms about alcohol consumption for that same student are more likely to be shaped by their parents when they meet their future in-laws. Moreover,

adults are rarely under direct and explicit social pressure to enact certain actions. Indeed, subjective norms have been observed to have lower predictive value for adults compared to adolescents (see McEachan et al., 2011).

Given that the TPB is more recent than its predecessors, it has benefited from the insights provided by the research examining these earlier models. As such, it does share similarities with some of them. Among these, there are similarities between the notions of perceived behaviour control and the concept of self-efficacy from the SCT. In addition, the TPB adopted an expectancy-value approach to attitude, which is similar to the approach that underlies the core sets of cognitions in the HBM.

Overall, the TPB appears to offer some improvement in terms of predictive value over theories that preceded it, particularly when compared to the HBM. For example, Bish et al. (2000) compared the ability of the HBM and the TPB to predict intentions to complete cervical smear tests and observed that the HBM accounted for 4% of the variance in intentions while the TPB accounted for 51% of the variance. These results align with those of other work comparing the HBM and TPB (e.g., Conner and Norman, 1994; Quine et al., 1998; Weinstein, 1993).

Perhaps because of its popularity, the TPB has often been the focus of critics. The size of the effects garnered by the theory has been criticized (see Sniehotta et al., 2014). Another frequent criticism is aimed at a central tenet of the TPB: that attitude, subjective norms, perceived behavioural control, and intentions are sufficient to account for behaviour. These critics argue, directly or indirectly, that the model is too reductionist and that it needs to be supplemented by other variables (e.g., Kam et al., 2008).

The TPB has also been criticized for focusing on the proximal determinants of behaviour, leaving out explanations as to what factors influence these proximal determinants (cf., Conner and Armitage, 1998). As already discussed, another frequent criticism focuses on the conceptualization and operationalization of the main components of the TPB, particularly subjective norms.

In sum, the TPB is an important and often-used theory in understanding health behaviours. The theory focuses on the factors that influence intentions to act. Meta-analyses have indicated that the factors of the TPB generally have medium to large effects on intentions and small to medium effects on behaviour. While these studies have generally found a smaller effect for subjective norms in the TPB model, the way that norms were originally conceptualized in the model does present some problems. A novel approach to norms, as well as a greater consideration of how meso and macro factors may shape the cognitions proposed under the TPB, may provide important and valuable theoretical and applied insights.

Implementation Intentions

Peter Gollwitzer and his colleagues took particular interest in the gap between intentions and behaviour. They realized that the time between when a goal is set and when a goal is acted upon is often long, which leads to people failing to act (see Gollwitzer, 1999). To explain the intention-behaviour gap, they introduced the idea that intentions often require an implementation plan. Specifically, Gollwitzer differentiated IIs from broader goal intentions. A goal intention is simply something that someone wants to achieve, such as wanting to lose 10 pounds. They proposed that setting such goal intentions is merely a first step to enacting a course of action, and that planning how to achieve the goal, getting started, and completing goal striving are equally important steps. As a result, they introduced the concept of an II, which is the act of committing to how, when, and where the goal will be achieved (see Gollwitzer, 1999).

From an II perspective, good intentions are more likely to be acted upon if a person has IIs – an ‘if/then’ plan – in place. For example, an II could take the following form: if I get home from work by 5 pm on a given day, then I will go to the gym. Importantly, the desired behaviour – going to the gym – is now part of a specific plan. If a person had such a plan in place and they got home from work at 4:45 pm, they would not have to consider all possible options to occupy their evening, such as trying a new recipe or just flopping in front of a screen. Rather, with an implementation plan, the desired, pre-selected response often becomes efficient, immediate, and automatic (Brandstatter et al., 2001).

Through the II process, many of the issues that impede goal completion are resolved (see Gollwitzer, 1999). For instance, procrastination is reduced because the decision to act has already been made. Distractions are also reduced, as other possible goal pursuits are no longer in competition with the previously decided-upon action. The need for willpower is reduced, as the environmental cues one selected (the 'ifs' in the intention) direct the behaviour (the 'then').

As with its predecessors, this approach was not elaborated specifically for health behaviours, although it is commonly used in that context (see Gollwitzer and Sheeran, 2006). The efficacy of IIs is supported by a sizeable body of research, which uses various types of designs and behaviours (see Sheeran et al., 2005 for a review specific to health). In their meta-analysis, Gollwitzer and Sheeran (2006) report that the overall impact of forming IIs on goal achievement in the context of health behaviours was Cohen's d of 0.59, with a 95% CI of 0.52 to 0.67, which can be characterized in the range of medium size. Interestingly, IIs appeared to have stronger effects for individuals facing mental health issues (e.g., schizophrenic patients, frontal lobe patients, and heroin addicts), with large effect sizes observed in these populations.

Two recent meta-analyses have also looked at the effects of IIs on diet (Adriaanse et al., 2011) and exercise (Bélanger-Gravel et al., 2013). For diet, IIs were found to be effective at increasing the intake of healthy foods ($d = 0.59$) but were less effective in decreasing the intake of unhealthy foods ($d = 0.29$; Adriaanse et al., 2011). The authors observed that the methodological quality of the studies meta-analysed moderated the effect size estimates. Specifically, studies that used better control groups resulted in smaller effect size estimates, while studies that used better outcome measures reported larger effect size estimates. For exercise behaviours, Bélanger-Gravel et al. (2013) report a standard mean difference of 0.31, 95% CI [0.13, 0.35], for IIs at post intervention, which they qualify as a small to medium effect.

As with the theories reviewed previously, implementation intention has obvious connections to past work, particularly to the TPB. This link has been examined by some researchers. For instance, Sheeran and Orbell (2000) randomly assigned women to a cervical cancer screening implementation condition or to a control. They observed that, although TPB variables (i.e., attitudes, subjective norms, perceived behavioural control and intentions) provided good predictors of screening attendance, IIs provided a better one. This pattern of result had been observed in other studies (e.g., breast self-examination, Orbell et al., 1997), supporting the incremental value of the II approach.

Since it does draw on elements of some of its theoretical predecessors, the theory shares some of their critiques, such as reductionism. In particular, the II approach assumes that people are willing and able to engage in a particular behaviour or behaviour change. It offers little in terms of explaining what makes someone willing and able to engage in a behaviour or behaviour change. Critiques aside, II is arguably among the simplest, most effective forms of applied social psychological interventions technique relying on cognitive approaches to influence the prevalence of health-related behaviour among large groups of people over time (e.g., Adriaanse et al., 2011; Bélanger-Gravel et al., 2013; Gollwitzer and Sheeran, 2006).

In sum, II was developed to address the gap between intentions and behaviour. The work suggests that the likelihood of goal attainment increases by committing to how, where, and when that goal will be pursued. A central aspect of the theory is that people who create if/then plans for desired behaviours reduce barriers to goal attainment. Research has suggested that IIs are generally effective for health behaviours, with effect sizes typically in the medium range. IIs require relatively low cost and resources intervention techniques. As such, they offer currently one of the most cost-effective avenues for interventions to increase the likelihood of the occurrence of health-related behaviours across large groups of individuals.

Social Norm Theories

Although often underestimated by lay people and scholars alike, social norms have been increasingly recognized as a powerful source of influence on behaviour (see Cialdini, 2005). From a social cognitive perspective, norms are typically conceptualized as perceived norms, which are stored in memory and retrieved when prompted by situational cues. These norms are assumed to capture our perceptions of how people typically think, feel, or act in a given situation. From this information, we infer what is typically perceived as normal and acceptable in a given context, which forms basis for comparative judgements to

guide and evaluate our own thoughts, feelings, and actions.

The direct presence of others is not a requirement of most theoretical approaches for normative influence to occur; in part because norms can become internalized. This notion is supported by numerous studies in which the influence of norms was observed regardless of the absence of observers (e.g., Aarts and Dijksterhuis, 2003; Deutsch and Gerard, 1955; Giguère et al., 2016; Postmes et al., 2001). Normative influence can also occur without the need for conscious awareness (e.g., Aarts and Dijksterhuis, 2003; Nolan et al., 2008). As such, for most approaches, the influence of social norms does not necessitate that individuals hold rational explicit cognitions for them to act in a certain way.

One challenge when reviewing the role of norms from a social cognitive perspective in the context of health is the range of conceptualizations and operationalizations of the notion of norms in the scholarly literature. A few more well-known, distinct conceptualizations of norms can be found. The TPB defines norms as subjective norms, which are assumed to represent what important others expect someone to think, feel, or do, and these norms are expected to operate mainly through external pressures. The Focus Theory of Normative Conduct distinguishes between descriptive norms, which describe what is typical or normal, and injunctive norms, which capture 'what constitutes morally approved and disapproved conduct' (Cialdini et al., 1990: 1015). The Social Identity Approach to normative influence focuses on the notion of group norms, which are defined as the accepted or implied rules of how behaviourally-relevant ingroup members should, and do, behave (see Smith and Louis, 2009; Turner, 1991); these group norms can be either descriptive or injunctive in nature.

The importance of normative influence on behaviour has been questioned, primarily due to the mixed support in research on subjective norms (cf., Armitage and Conner, 2001). As we previously discussed, subjective norms have faced conceptualization and operationalization issues. Social Identity Approaches to norms have aimed to address some of these issues (see Smith and Louis, 2009). The approach extends the notion of norms beyond external prescriptions that are dependent on the extent to which one believes a behaviour is expected and observable by important others. It proposes that, when specific group memberships form a salient basis for self-definition, individuals construct context-specific ingroup norms based on what they perceive as the prototypical ingroup beliefs, attitudes, feelings, and behaviours. From this perspective, the influence of norms occurs through a cognitive process which brings a group membership to become the salient basis for self-definition – a process called self-categorization, which is independent of social pressure (see Turner, 1991).

Multiple studies have supported the value of this approach in the context of health behaviours. In two studies, Terry and Hogg (1996) observed that group norms were positively associated with intentions to use sunscreen and that this relationship was moderated by the degree to which someone identified with the behaviourally-relevant reference group. The influence of group norms has been supported with a host of health-related behaviours, including smoking (e.g., Schofield et al., 2003), alcohol consumption (e.g., Giguère et al., 2014; Neighbors et al., 2008), substance use (e.g., Verkooijen et al., 2007), healthy eating (e.g., Louis et al., 2007; Stok et al., 2012), flu vaccination (e.g., Falomir-Pichastor et al., 2009), and physical activity (e.g., Chatzisarantis et al., 2009).

The potential value of social norms in understanding health behaviours is further supported by research examining alternatives to the subjective norms conceptualization. Ravis and Sheeran (2003) report a meta-analysis that examined descriptive norms as an additional predictor to the factors proposed by the TPB in the context of health behaviours. Their results suggest that descriptive norms account for variance incrementally above subjective norms in predicting intentions and behaviour ($\Delta R^2 = .05$).

Manning (2009) conducted a meta-analysis to examine the role of descriptive and injunctive norms on behaviour, with an emphasis on health behaviours. His results revealed that descriptive norms had a greater influence on behaviour compared to injunctive norms ($r = .34$ and $.28$, respectively), particularly when behaviours were not socially approved, were more socially motivated, and more pleasant. Overall, it appears that, in most cases, descriptive norms seem to have a greater effect in predicting behaviour compared to other conceptualizations of norms. The literature also suggests that descriptive norms tend to have greater influence on unhealthy behaviours than healthy ones (see Ravis and Sheeran, 2003).

Central to most theories about the influence of norms is their cognitive salience. Indeed, the Focus Theory of Normative Conduct (Cialdini et al., 1990) argues that the salience of norms is the primary determinant of the influence of norms. Situational factors influencing the salience of norms are thus important factors in understanding normative influence. As such, the use of experimental designs in which the salience of normative information is manipulated is well suited to understanding normative influence.

Providing insight in this approach, Sheeran and colleagues (2016) conducted a meta-analysis examining experimental research focusing, in part, on norms. They report that experimentally-induced changes in norms were associated with a small to medium effect of change in intentions ($d = .49$) and behaviour ($d = .36$). Importantly, their findings suggested that a change in norms was sufficient to change behaviour, even without changes in attitudes and self-efficacy. Interestingly, their findings also suggest that the influence of norms on behaviour was, in part, independent of their influence on intentions. This finding aligns with the idea that the influence of norms can occur directly, bypassing individuals' conscious intentions.

Some important questions about social norms with important implications for health behaviours remain understudied, particularly from a social cognitive perspective. Among these, how people identify the norm in a given situation is central to understanding the impact of norms on health behaviours. The work of Prentice and Miller (1993) is among the few that have focused on this question. Their investigation on campus alcohol consumption norms revealed that students made a systematic error in their identification of norms by overestimating the degree to which alcohol consumption was normal. They suggest that this misperception may be due to a biased display of public support for the normative behaviour and a biased encoding of the public behaviour of others. Their work, along with others (e.g., Kashima et al., 2013), suggests that people tend to apply the normative information they observe from a few salient exemplars to all members of a social category, such as defined by a group or a community. The implications of this cognitive process in the case of health behaviours are important. It is likely that, in the case of health-behaviour norms, unhealthy exemplars are more salient, and thus lead to a biased perception of norms in an unhealthy direction. Beyond identifying norms, other aspects that would benefit from further investigations with particular relevance to health include how norms change over time, how multiple norms interact to influence behaviour, and how to best use norms-based interventions to affect beliefs and behaviours.

Social norms and the social comparison process linked to them underlie much theorizing in social cognitive models. The notion of norms is part of the SCT and the TPB. There are interesting parallels between a norm-based approach and II. Norms provide information about which action is desirable, along with how, when, and where the action will be achieved. Similarly, the II approach focuses on if/then plans to pre-commit to how, when, and where a goal-related action will be performed. A norm-based approach may offer one avenue to provide insight in the source of naturally occurring IIs. The possible interactions between norms and other types of cognitions also remain an understudied area with much potential. For example, Walker et al. (2011) suggest that perceiving social norms encouraging marijuana use can be associated with a lower sense of self-efficacy in avoiding using marijuana.

In sum, the multiple social cognitive theories about social norms and their influence seem to converge on a few important issues. First, social norms have a meaningful influence on behaviour, including health behaviours. Second, the influence of norms on behaviour can occur through their impact on intentions or directly on behaviour. Third, multiple different conceptualizations of norms can be found in the field. Of these conceptualizations, descriptive norms appear to have the strongest and most consistent influence on health-related behaviours across studies.

Cognitive Dissonance

The overarching idea of cognitive dissonance is that psychological inconsistency makes people experience an uncomfortable state of arousal (Festinger and Carlsmith, 1959). People tend to maintain logical consistency both between their cognitions and between their cognitions and their behaviours. Failure to maintain such consistency leads most people to experience a state of unpleasant arousal, which can only be resolved by removing the inconsistency. Thus, this approach focuses on instances when people believe that they are acting freely but think or behave in ways they did not intend, or which they would not perceive as rational.

To highlight the nature of cognitive dissonance and dissonance reduction, Festinger (1957) described someone who is a cigarette smoker. This person is engaged in a behaviour that they know is harmful to their health, which results in dissonance. Festinger proposed the person would engage in ongoing attempts to rid themselves of this dissonance. For instance, they could change their behaviours by quitting smoking. Alternatively, they could change their beliefs about the effects of smoking, by choosing to reject, downplay, or question the science showing that smoking is bad for their health. They could also change their other beliefs by deciding that it is better to 'live fast and die young' than it is to live a longer, less exciting life. If any of these strategies are successful, the person will have eliminated the uncomfortable dissonance that arose from the knowledge that smoking was harmful to their health.

Drawing on the idea of cognitive dissonance and on analogies with disease inoculation, William McGuire and his colleagues (e.g., Papageorgis and McGuire, 1961) surmised that people tend to defend their beliefs, including health beliefs, by avoiding exposure to inconsistent information. In doing so, they may leave themselves in a position where they are unmotivated and inexperienced in developing supporting arguments for their beliefs and in refuting counter-arguments. McGuire and his colleagues thus proposed that a process of inoculation could prepare people to address the content of specific arguments that they might encounter. The effectiveness of this method has been demonstrated through interventions with adolescents to inoculate them against smoking (e.g., Evans et al., 1978). They were exposed to a review of pro-smoking arguments that they may encounter and given time to come up with counter-arguments. The presence of these practiced counter-arguments effectively increased adolescents ability to resist peer pressure, which led to reduced smoking rates (Evans et al., 1978). Banas and Rains (2010) conducted a general meta-analysis of inoculation theory. The mean effect size of inoculation was $d = 0.43$ when compared to participants who were not inoculated, and the 95% CI ranged from 0.39 to 0.48.

Dissonance-based field studies and interventions have been used to address condom use (e.g., Stone et al., 1994) and eating disorders (e.g., Stice et al., 2007) among other behaviours (see Freijy and Kothe, 2013, for a review). A meta-analysis of eating disorder interventions showed that the presence of dissonance-related content was associated with significantly reduced body dissatisfaction ($z = 2.10$), thin ideal internalization ($z = 2.22$), dieting ($z = 2.78$), negative affect ($z = 2.39$), and eating pathology ($z = 3.11$) but not changes in body mass ($z = -0.57$; Stice et al., 2007), effect sizes which are classifiable in the small to medium range (cf., Cohen, 1992).

In sum, cognitive dissonance provides a theoretical perspective to understand why and how people continue problematic health behaviours. In general, meta-analysis shows that inoculation has a small to medium effect size. Future research should consider conflicting thoughts and beliefs around health behaviours, as their presence may help explain the general disconnect between intentions and behaviour.

Social Cognition and Health Behaviour Change

As illustrated by the social cognitive theories that are commonly applied to health, this domain of research has been primarily focused on the factors predicting health-related behaviours. This 'predictive research' typically uses self-report measures of social cognitions to predict intentions and/or behaviour; often using cross-sectional or longitudinal survey designs. Many would argue, however, that the key goal of social cognitive research is not to merely explain and predict health behaviour but to foster behaviour change through interventions that induce changes in social cognitions (cf., Conner and Norman, 2005; Rutter and Quine, 2002).

The social cognitive research into behaviour change is generally based on one of three different strategies, which are not mutually exclusive. First, some research uses experimental designs to examine hypotheses, which typically have arisen from 'predictive research', about behaviour change. Second, some research examines social cognitive models that focus solely on behaviour change. Finally, some research targets intervention programmes, which typically combine multiple behaviour change techniques and which are often social cognitive in nature. These strategies all focus on examining the effect of changes in social cognitions on behaviour change. We describe each in further detail in the following three sections.

Experimental Examination of Predictive Models

The focus on the causal influence of social cognitions on behaviour underlies the use of experimental methods; the intent being to establish a strong argument for causality. Experimental approaches do bring complementary evidence to the primarily correlational methods used in 'predictive research'. The assumption behind much of the 'predictive research' is that experimental manipulations of, and interventions to change, social cognitions observed to predict health-related behaviours will lead to changes in behaviour similar in magnitude and direction to the effect sizes observed in predictive research. Evidence that certain social cognitive processes co-occur with a certain behaviour, however, does not necessarily mean that induced changes in these social cognitive processes will result in comparable changes in behaviour. For example, it may be that both the social cognitive process and the health-related behaviour are caused by a third variable. Although this issue can be partly addressed in longitudinal prospective studies that aim to predict future occurrences of behaviour using social cognitions, such designs do not fully address this issue, particularly as it pertains to behaviour change. Therefore, experimental research that examines whether changes in social cognitions lead to the expected changes in behaviour can offer a unique contribution to the domain.

In addition, from a behaviour change perspective, the manipulations used in these experiments are often amenable to be adapted to intervention techniques or directly inform their design. For example, work that revealed that university student drinking norm misperception was associated with student problematic drinking led to research manipulating norm perceptions in order to correct misperceptions, which ultimately lead to intervention programmes focusing on correction of norms misperceptions (see Perkins, 2002, for a more complete discussion of evolution of alcohol misuse norm-based interventions).

There is a steadily increasing body of knowledge examining some of the key predictions derived from social cognitive models. For aspects of some theories, the body of available knowledge has now been the subject of meta-analyses. For example, Webb and Sheeran (2006) conducted a meta-analysis of 47 studies that used experimental methods to examine the relationship between intentions and behaviour, focusing primarily on health-related behaviour. They reported that a medium to large change in intentions ($d = 0.66$) led to a small to medium change in behaviour ($d = 0.36$). Their results support the notion that induced intention changes did impact behaviour; albeit less than what would have been expected based on predictive research.

In another meta-analysis of 204 studies, Sheeran and colleagues (2016) examined the effect of experimental changes in self-efficacy, norms, and attitudes on intended or actual health-related behaviour. They reported that these factors have medium-sized effects on intentions ($d = 0.51$, 0.49 , and 0.48 , respectively). They also reported that changes in norms and attitudes had a small effect on behaviour ($d = 0.36$ and 0.38 , respectively), while self-efficacy had a medium effect ($d = 0.47$). Finally, they also note that, overall, the effect sizes were larger for manipulations that aimed at increasing a target behaviour instead of decreasing it. Importantly for comparisons with past meta-analyses focusing on correlational studies, they reported that effect sizes from correlational studies were generally larger than those from experimental studies.

The different results between predictive correlational and experimental research suggest that the presumption that the observations from correlational work will be essentially the same as those from experimental work is likely unfounded. Overall, it appears that effect sizes may be smaller with induced social cognitive changes. This highlights the need for care when applying the results of primarily correlational work in the context of health behaviour change, such as when attempting to estimate the possible effects of social cognitive interventions to induce change.

Social Cognitive Models of Behaviour Change

From its inception, social psychology has been concerned with addressing social issues. Therefore, it is not surprising that some social cognitive models specifically focus on health change and prevention. The most common application of social psychology to health has involved attempts to change health-related attitudes. Early work by Irving Janis, Howard Leventhal, and other scholars often explored the use of fear appeals to motivate people to change such life-threatening habits as cigarette smoking (see Leventhal, 1970). For example, Janis and Feshbach (1953) examined the impact of fear appeals of various strengths on conformity

to dental hygiene recommendations. The rationale for the study was that if you can alert people to health threats and raise their concern, you can motivate them to change their behaviour. Counter-intuitively, their work demonstrated that minimal fear appeals produced greater conformity than stronger fear appeals.

Protection Motivation Theory (Rogers, 1975) and its later revisions (e.g., Maddux and Rogers, 1983; Rogers, 1983) are social cognitive theories that focus on explaining the impact of such fear-appeals on attitudes and behaviour. Its impetus was to understand how induced changes in social cognition can lead to changes in behaviour – as opposed to generally explain how social cognitions influence behaviour. The theory is typically understood to propose that two categories of social cognitive processes are the primary determinant of protection motivation: threat appraisal (e.g., fear; perceived vulnerability to a health threat) and coping appraisal (e.g., perceived response efficacy; self-efficacy). Threat appraisal is proposed to increase maladaptive coping (e.g., denial; fatalism) and to motivate protective behaviours (e.g., getting screened for cancer). Coping appraisal is proposed to decrease maladaptive coping and to increase protection motivation. Protection motivation is typically operationalized in terms of behavioural intentions. Results of meta-analyses suggest that threat appraisals have effects generally characterized as small to medium on intentions ($.10 < r's < .20$) while coping appraisals have effects generally characterized as medium ($-.34 < r's < .33$; Milne et al., 2000). Their results, along with others, suggest that coping appraisals generally have larger effects than threat (see also Floyd et al., 2000). With regards to subsequent behaviour, the results of Milne et al. suggest effects best characterized as very small for threat appraisals ($-.04 < r's < .12$) and small to medium for coping appraisals ($-.25 < r's < .22$).

The usefulness of fear appeals in terms of promoting health changes remains controversial. Efforts to instil fear or feelings of threat can sometimes backfire, making people less, rather than more, receptive to health-related communications (see Gerrard et al., 1996). There are, however, some notable successful applications of fear-arousing approaches to motivating healthy behaviour change. For example, Fong et al. (2009) offer a compelling review of numerous studies from multiple countries that show decreased smoking rates after the introduction of graphic pictorial anti-smoking images on cigarette packs.

A meta-analysis by Witte and Allen (2000) helped further clarify the use of fear-appeals in health promotion campaigns by revealing that they tend to produce greatest behaviour change when they are used in combination with high-efficacy messages. That is, fear appeals work best when the message also promotes the individual's sense of self-efficacy to change the behaviour and their sense that the behaviour change can help them to avoid the fear-provoking outcome.

Other models of social cognitive behaviour change have also been proposed. Among these, there has been a recent emergence of research and intervention programmes to promote changes through the use of social norms (see Miller and Prentice, 2016). In the context of health, the most frequent use of this approach has been to curtail problematic alcohol consumption, primarily in college students. Three main forms of norm-based interventions have been used: personalized normative feedback interventions, group-based approaches, and social norm marketing approaches.

First, in personalized normative feedback interventions, individuals are provided with feedback about their own behaviour and the behaviour of a relevant reference group. This approach typically highlights discrepancies between the person's actions and those of the group in a way that encourages a desired outcome (see Lewis and Neighbors, 2007, for an example). Second, group-based approaches have used small group discussions led by facilitators to provide opportunities for participants to compare their perspectives and to motivate them to engage in behaviour change. This approach can be quite effective due to the fact that participants often believe that others have endorsed a new behaviour (see Schroeder and Prentice, 1998, for an example). Third, Social Norm Marketing Approaches (SNMAs) involve the use of mass media communication to disseminate a factual message about the incidence of some desirable behaviour to a target audience (see DeJong et al., 2006, for examples).

This distinction between individualized (e.g., interaction with expert, computer generated feedback), small group with possibility of communication among members, and mass social marketing approaches as modes of delivery is one that can be applied to most behaviour change techniques derived from social cognitive research. Of these, social marketing approaches offer unique opportunities to address health issues by

reaching a large target audience in a cost-effective way (see Lee and Kotler, 2011).

In terms of the types of behavioural change techniques used, providing information (e.g., behaviour outcomes; risk awareness) is among the most common one in intervention research drawing on social cognitive approaches. This technique does align well with the central defining feature of social cognitive approaches, which is that cognition is a primary determinant of behaviour. Other techniques commonly observed in the literature include skill focused techniques (e.g., skill building) and goal-setting. Abraham and Michie (2008) conducted a systematic review and coding of published interventions and manuals and proposed a taxonomy of 26 techniques of health behaviour change – the majority of which are social cognitive in nature. Michie et al. (2011) offered a revised taxonomy of 40 techniques. These taxonomies offer unique opportunities for the field to identify which combination of techniques maximizes effectiveness and minimizes risk. We strongly recommend that applied research considers them in their work.

Intervention Programmes

Intervention programmes can be broadly defined as a collection of activities typically drawing on a combination of intervention techniques to reach predefined objectives. In the context of health, programmes typically include activities aimed at health promotion or the prevention of unhealthy behaviours to impact the overall health of a group of individuals. Typically, researchers are involved in what could be best described as pilot interventions, trial interventions, or programme efficacy studies (cf., Bégin et al., 2009). These are typically time-limited activities and are smaller scale compared to actual programmes, which are typically managed by public and/or non-profit organizations.

Applied social psychologists tend to use one of three approaches to examine intervention programmes. In the first, they focus on the development of a specific intervention programme that then they implement (researcher-driven programmes). For example, the Brief Alcohol Screening and Intervention for College Study (BASICS) is based primarily on SCT and Social Norm Theory and uses these theoretical bases to address problematic alcohol consumption on campuses (Dimeff et al., 1999). Fachini et al. (2012) report a meta-analysis of randomized control studies of this standardized, manualized intervention. Their results showed a reduction in alcohol consumption (–1.50 drinks per week, 95% CI: –3.24 to –0.29) and alcohol-related problems (mean difference: –0.87, 95% CI: –1.58 to –0.20) at 12 months follow up after the BASICS programme.

The second approach involves examining intervention programmes being implemented by stakeholders (i.e., individuals who have a vested interest in the possible programme) (stakeholder-driven programmes). Typically, this type of work is done when stakeholders want to pilot test intervention programmes to identify possible issues with implementation and/or to evaluate effectiveness before implementation on a wider scale (e.g., expanding the target audience, running the programme on a permanent basis). Finally, in some cases, applied social psychologists will engage in collaborations with stakeholders to design, implement, and evaluate either a complete intervention programme or some of its components (collaborative programmes).

Although many interventions are evaluated in part, or over a brief period of time, there are some cases in which applied social psychologists have been able to focus their work on ongoing full-scale intervention programmes. Among these, the work of Geoffrey Fong as part of the International Tobacco Control Policy Evaluation Project is one of the most noteworthy. The collaborative project focuses on how intervention techniques derived from tobacco control policies implemented by different governments influence social cognitions and the resulting behaviour change. The work also includes indicators of the public health and economic impacts (see Fong et al., 2006). This collaborative project is remarkable for many reasons. Of particular importance to the present topic is the focus on the causal chain that impacts intervention programmes: starting with policy, which promotes intervention techniques, which impact social cognitions, which then impact behaviours (see Fong et al., 2006). This project suggests that policy-level changes can indeed impact social cognitions and behaviour. It provides an excellent example for applied social psychologists to follow.

Challenges and Future Directions

The main focus of social cognitive theories when applied in a health context can be defined as to seek out the most parsimonious set of processes that will account for the most meaningful amount of statistical variance in the physical, psychological, and/or social health of large groups of people. The typical ultimate goal is to use the knowledge generated through this theory-informed research to design interventions aimed at changing behaviour to improve the overall physical, psychological, and/or social health of large groups of individuals.

A few of the relevant social cognitive processes are featured in several theories and have therefore received more focus in the applied research literature. Among these processes, the notions of behavioural intentions and self-efficacy are two that clearly stem from social cognitive applied research in the area of health (cf., Conner and Norman, 2005).

The notion of behavioural intentions as a proximal determinant of health behaviour is common to the TPB and the I1 approaches, as well as more recent applications of the HBM and SCT. As we have reviewed herein, the evidence seems clear: Setting intentions to engage in a course of health-related actions increases the likelihood that these actions will be carried out. The effect sizes that have been observed tend to be typically characterized as small to medium, according to prevailing rules of thumb (cf., Cohen, 1992). Interestingly, the impact of intention setting on behaviour is enhanced when combined with an implementation plan. As such, among social cognitive approaches, I1 offers one of the most resource effective modes of intervention to induce behaviour change, when appropriate to utilize given the context.

The concept of self-efficacy is central to SCT, it is part of recent work on the HBM, it is also part of the TPB, in terms of the notion of perceived behavioural control, and it is part of the rationale for I1s. As we have reviewed herein, the evidence also seems clear: An increased sense of self-efficacy is associated with increases in the likelihood that people will engage in healthy behaviours. As with intentions, the effect sizes tend to be typically characterized as small to medium according to prevailing rules of thumb (cf., Cohen, 1992).

Social cognitive approaches have shown promise in contributing to health-related behaviour change among groups of individuals. Indeed, this area of research and practice has tremendous potential to significantly impact societies. Projects like the International Tobacco Collaboration, which document the impact of policies on social cognitions, behaviour, and health (see Fong et al., 2006) offer astonishing examples of this potential.

There are, however, multiple challenges ahead. Although some clear patterns are emerging out of the research into social cognitive models applied to health, there remains much work to be done in consolidating the knowledge about current models. The research on behaviour change and intervention programmes remains limited, and research that allows the inference of causality is particularly lacking. Such work is fundamental to bridging our understanding of the social cognitive determinants of health with interventions that address health issues. Finally, the research thus far has generally focused on social cognitive models that assume individuals act as rational beings who are primarily focused on being 'healthy' as defined by current prevailing consensus in medicine. Theoretical alternatives to these assumptions should be proposed and investigated.

Consolidating Knowledge of Current Models

The focus of current approaches is to build cumulative knowledge to understand some of the causes of health-related behaviours. This approach lends itself to the use of meta-analytical techniques, which aligns with current statistical recommendations (see Cumming, 2014; Ioannidis, 2005). Indeed, there are multiple important meta-analyses that help synthesize the knowledge derived from social cognitive research (e.g., Armitage and Conner, 2001; Sheeran et al., 2014; Sheeran, et al., 2016; Webb and Sheeran, 2006). These meta-analyses tend to rely on the 'small', 'medium', and 'large' effect size categories that Cohen hesitatingly introduced in 1988. Although they facilitate interpretation of results, as evidenced by our use of these categories in this chapter, such a 't-shirt size' approach to interpreting effect sizes has disadvantages, such as implying that factors with smaller effect sizes are trivial in understanding health behaviour (cf., Marks, 1996).

As this domain of research moves forward, a more nuanced interpretation of effect sizes may be beneficial, as sometimes even small effect sizes can be meaningful (see Cohen, 1988; Thompson, 2006). It should be recognized at the outset that, given that health behaviours are the result of biological, psychological, and social factors, as well as their interactions, the notion that any one approach could account for the majority variance in a health behaviour is likely not a realistic expectation. Thus, while constantly searching for more predictive value, we should be modest in our expectations of how much variance a factor or theory can account for.

It may also be useful to distinguish the type of outcome being examined. Three broad types of outcomes can often be observed in this area: social cognitive outcomes, behavioural outcomes, and impacts on health. Cognitive outcomes are typically the cognitions assumed to underlie the motivation for a behaviour, such as attitudes and intentions. Behavioural outcomes are typically the individual-level proximal actions that affect health. The impact on health is typically defined in terms of morbidity and/or mortality, and is assumed to be affected by the re-occurrence of health behaviours over time. Given that the ultimate goal is to impact the overall health of groups of individuals, understanding health impact should be viewed as of greater value than understanding behaviour, and understanding behaviour should be viewed as of greater value than understanding cognition. Thus, a small percentage of variance explained in health impact may be more meaningful than a small percentage of variance explained in cognition.

Another issue in terms of consolidating our understanding of current prevailing models is that the research examining these models has tended to focus on some aspects of theories, and not others. Indeed, few of the studies examining social cognitive models rigorously apply the theories they draw from (see Painter et al., 2008). The trend in the literature seems to be to study the components that lend themselves to self-report measures and generally to omit those that require more involved research designs. For example, in SCT, expected outcomes and self-efficacy have received much more empirical research attention compared to reciprocal determinism and collective efficacy. As such, researchers may make greater contributions to the field by a careful and complete examination of the current prevailing models than by suggesting new models. To fully examine the current models in terms of their ability to predict health-related behaviours, researchers may need to learn different methodological approaches, use multi-method approaches, and engage in interdisciplinary collaborations.

From Predicting to Intervention

One of the most important challenges in this area of work, if not the most important challenge, will be to increase the focus on interventions. Although there seems to be wide interest in applying social cognitive models of health to behaviour change interventions, there is still limited research that informs these models. For example, of the 18,000 records examined by Sheeran and colleagues (2016), only 204 tested the effects of changes of attitude, norms, and/or efficacy on intentions or behaviour. A focus on interventions will further consolidate the knowledge derived from current prevailing social cognitive models and contribute to the fulfillment of the goal of addressing health issues that affect large groups of individuals.

There are many important challenges to conducting intervention research. These studies are typically quite demanding. The design, conduct, and reporting of intervention studies often require more time, effort, and resources than other types of research, particularly if they involve a collaboration between researchers and non-academic stakeholders. Some challenges are particularly notable for social cognitive intervention studies conducted in the context of health.

One such specific challenge, which is rarely discussed, involves the possible risks to participants of intervention studies and the increased demands these risks place on researchers. The prevailing logic behind pursuing intervention programmes often seems to be that doing anything is better than doing nothing. The assumption is that trying out an intervention comes at no additional risk. Unfortunately, this is not always the case. There have been documented adverse effects of intervention programmes, which are often referred to as 'boomerang effects'. For example, Wechsler et al. (2003) observed that some social norm marketing intervention campaigns aimed at reducing alcohol consumption among college students ended up increasing alcohol consumption. In another example, Mann et al. (1997) used group discussion to reduce the prevalence of eating disorders among female students. Unfortunately, the programme led participants to perceive that

eating disorders were more common than they did prior to the intervention.

The consideration of possible adverse effects is crucial to intervention research, particularly when the interventions focus on health outcomes. Researchers must design intervention studies that minimize, monitor, and contain potential adverse effects. A notable example of such a containment strategy comes from the sustainability literature. Schultz et al. (2007) conducted a field study examining a norm-based intervention to reduce energy consumption. Anticipating that a normative message might have a boomerang effect on people who were already low energy consumers, the researchers included an additional norm-based feedback to prevent such a result (see Truelove, Schultz and Gillis, Chapter 24).

Another specific challenge arises from the assessment of intervening variables. Examining expected intervening variables is crucial to the contribution of social cognitive intervention research. For example, if researchers test an intervention designed to change perceived norms about drinking on a college campus in order to decrease alcohol consumption, they cannot only measure changes in alcohol consumption. They must also determine if the intervention influenced perceived norms if they want to establish a causal chain (see Spencer et al., 2005). Collection of this information often requires the participation of the stakeholders or their staff, who may not be aware of the importance of this information or have resources and time to gather it, and thus may not systematically collect it.

Finally, the potential contributions of intervention research to our knowledge depend largely on the willingness and capacity of researchers to share the details and results of their interventions with transparency; the dissemination of findings is crucial, whether results support the effectiveness of the attempted intervention or not. To this end, adhering to open science principles (Nosek et al., 2015), using standard measures of behaviour change whenever possible (e.g., Semaan et al., 2002), and adhering to the suggestions of Davidson et al. (2003) may prove invaluable. Specifically, Davidson et al. (2003) recommend that researchers report (a) the content or elements of the intervention, (b) the characteristics of those delivering the intervention, (c) the characteristics of the participants, (d) the setting, (e) the mode of delivery, (f) the intensity, (g) the duration, and (h) adherence to delivery protocols. Adhering to these suggestions is an important challenge for researchers, since many scholarly outlets are not suitable to follow the above suggestions. This failure of scholarly outlets often leads researchers and practitioners, who may not have access to these scholarly outlets, to publish their work in the 'grey literature' (i.e., material and research produced and distributed outside the traditional commercial/academic channels).

In considering knowledge mobilization, researchers should be mindful that stakeholders may want to limit sharing details and data. As such, researchers should ensure to negotiate a knowledge mobilization plan with their stakeholder partners at the outset of their collaboration. As part of this process, researchers should strive for openness and transparency to maximize the potential benefits of the intervention study to our knowledge base. Researchers and practitioners could also contribute to the field by using open access platforms (e.g., the Open Science Framework) to share their grey literature publications.

The extra demands of intervention research have important repercussions for researchers, such as a lower scholarly publication rate. Researchers must rise up to these challenges. Intervention research is central to our ability to clearly demonstrate the value of our scholarship to society. Without such research, advocating for our fields will become challenging, if not impossible (see Cialdini, 2009). Beyond the egoistical costs to our own fields, the failure to engage in the increasing demand for social cognitive interventions for health-related behaviours may leave stakeholders without any expert support. This lack of expertise may create a situation where waves of poorly planned interventions are conducted, resulting in either indications of poor intervention effectiveness or in a failure to assess any effectiveness at all. These failed interventions will have real costs to real people. Moreover, they may create a body of findings suggesting social cognitive approaches to health are of little value.

For researchers to successfully rise up to the challenges of intervention research, they will need the support of their peers and their fields. Undoubtedly, a shift to increased intervention work will require many researchers, stakeholders, institutions, journal editors, journal publishers, grant reviewers, and multiple others to change their default way of thinking when it comes to research. Central to this shift will be a move from an overemphasis on discovery to a recognition of the fundamental role of integration and application in the

development of knowledge (see Boyer, 1990).

This shift will also require a change in training for some applied social psychology graduate programmes in order to prepare their graduates to engage in intervention research. For example, graduate students should all be required to complete programme evaluation courses and to gain experience working with non-academic stakeholders through practicums or work placements. Through such steps, applied social psychology can increase its ability to affect positive change in the world.

Future Directions

Theory is central to the discipline of applied social psychology and to the development of effective interventions (e.g., Michie and Prestwich, 2010). Theories are essential to identifying the causes of behaviours and thus to understand behavioural change. For the most part, the social cognitive theories that have been applied in a health context assume that people are both rational thinkers, who systematically consider information, and motivated to be healthy, as defined by current prevailing medical models (cf., Conner and Norman, 2005).

This assumption is somewhat surprising. The field of social psychology is composed of research that documents numerous instances where normal individuals act in ways that otherwise they would not have, and which often appear irrational or abnormal (see Krueger and Funder, 2004). Social psychology typically explains people's otherwise seemingly irrational or abnormal actions using some type of biased social cognitive processes. This perspective on social cognition, and how it is used to understand human behaviour, seems at odds with the notion of social cognition as it is often applied in the context of health.

There are some notable exceptions in the literature that illustrate the potential value of drawing more broadly on social psychological research into social cognition. For example, the work of Stone and colleagues (1994) suggests that inducing hypocrisy in adolescents by making them aware of the difference between their stated condom use beliefs and their actual behaviour could increase their subsequent condom purchases. Given that failures to act in an intended way or in the best interest of one's health seem to be at the root of many of the health issues, researchers may find some insights by examining social cognition more broadly.

A central assumption to many social cognitive theories is that macro and meso level factors will impact individuals at the micro level. For example, this multi-level assumption is well illustrated by the notion of reciprocal determinism that is found in Bandura's Social Cognitive Theory. Unfortunately, the multi-level hypotheses of these theories have not been the subject of much research in the context of health. This is surprising, given that the role of the social environment in health behaviour and health promotion interventions is well-established (see Stokols, 1992; Taylor and Sirois, 2014). Examinations of the interaction between sociostructural factors and individual-level social cognitions may help address some of the theoretical questions related to prevailing social cognitive health models. For example, it may help to explain the factors that influence the naturally occurring formation of attitudes and intentions. A multi-level approach may also help to understand the role of sociodemographic factors that affect health, such as socioeconomic status, gender, and race-ethnicity. This approach may also broaden the scope of social cognitive research, which typically focuses on self and other perceptions, by focusing on perceptions of systems, such as the health care system. However, investigating these avenues will most likely require the use of different research methodologies than are commonly used, including the use of qualitative research and interdisciplinary collaborations. It may also require that researchers and practitioners draw on social psychology theories that are not traditionally used in the context of health.

Social Identity Approaches, a term used to encompass Social Identity Theory (Tajfel and Turner, 1979) and Self-Categorization Theory (Turner et al., 1987), may be particularly well-suited to connect social cognitions and social structures in the context of health. In fact, Social Identity Theory emerged, in part, as a response to a concern that social psychology was becoming overly focused on micro level phenomena (see Taylor and Brown, 1979). This theory aims to bridge the gap between micro and macro levels, postulating that people act not only as individuals but also as group members with shared perceptions, goals, and identity. The theory has been used in the context of health-related behaviours (see Haslam et al., 2009) and offers many interesting avenues. For example, it is well suited to examining the impact of large-scale social changes on health, as

well as to understanding the origins of social movements in response to reforms that would decrease access to health care.

The concept of self-identity is also a central notion of much of social psychological research. Although also not a theory per se, there is an extensive body of social cognitive research focusing on the self and identity, which is typically defined in terms of knowledge about who we are and our ability to be an active agent affecting our environment. There have been some critiques which hold that the concept of the self is of little value in the context of predicting behaviour (e.g., Conner and Armitage, 1998), but the notion of the self has been placed at the centre of social cognitive approaches to health behaviour (see Conner and Norman, 2005). In particular, the concept of self-regulation has been proposed as integral to understanding the role of social cognition on health behaviours (e.g., Sirois, 2004; see Conner and Norman, 2005).

Increasingly, self and identity regulation are being recognized as having important implications for health behaviours, inasmuch as the processes involved can shape the motivational significance of the beliefs that underlie people's decisions to manage their health (Shepperd et al., 2011). Future work that focuses on the role of self/identity-regulation strategies in health would expand our understanding of when factors such as social norms may help or hinder health behaviour change. For example, individuals may engage in unhealthy behaviours, such as drinking and smoking, because they are linked to a desired identity (Shepperd et al., 2011), in which case the norms associated with this identity will be more salient than those that suggest such behaviours are undesirable.

One of the key challenges for social cognitive approaches applied to health is the limited generalizability of the findings due to the nature of the participants used in most studies. For the most part, social cognitive models applied to health have been studied using WEIRD participants: those who are in Western, Educated, Industrialized, Rich and Democratic contexts (Henrich et al., 2010). It is now clear that these participants are unique in many ways, including social cognitive processes, and as such, do not provide a strong basis for generalizations (see Henrich et al., 2010). Unfortunately, most researchers examining social cognitive models of health behaviour implicitly, or explicitly, assume that their findings with WEIRD participants are universal. As with intervention research, engaging in research with non-WEIRD populations has greater costs for the researcher and limited institutionalized advantages (see Henrich et al., 2010). That said, at the very least, researchers and practitioners should recognize any limitations in their work related to a restricted cultural context. As with intervention research, investment in conducting cultural, cross-cultural, and international research is central to the ability of this domain to address health issues on a large scale.

Conclusion

Overall, social cognitive approaches applied to health issues affecting groups of individuals are of tremendous value because of the prevailing desire to understand causes of behaviour and its changes. For example, this work allows us to understand which particular elements impact the effectiveness of an intervention, which in turn, allows us to answer a very common question asked by stakeholders: 'What do I need to include in my intervention for it to work?' The value of this approach has been demonstrated through successful intervention programmes, such as the Tobacco Control Policy Evaluation Project (Fong et al., 2006).

The approach is not without critiques. For example, the focus on parsimonious causes that helps inform effective intervention programmes often comes at the costs of reductionism. Although the approach has shown its value, there remain multiple challenges. For instance, there is a pressing need for more research focusing on behaviour change and intervention programmes. There are also many other possible avenues for social cognitive approaches to contribute to health issues. The connection between macro, meso and micro levels of explanation that underlies many social cognition approaches seems under-represented in empirical social cognitive health research.

In the end, it is worth the effort required to rise up to these challenges, in order to better understand and address the collective causes of health issues shared among large groups of people.

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