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COMMENTARY

Integrating intrapersonal and interpersonal processes: a key step in advancing the science of behavior change

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In the twenty-first century, efforts to reduce the prevalence of disease and to improve life expectancy are inextricably linked to modifying patterns of human behavior (Adams, Grandpre, Katz, & Shenson, 2019; Bauer, Briss, Goodman, & Bowman, 2014). To achieve this goal, health professionals need a toolbox composed of intervention strategies that effectively and efficiently help people make and sustain changes in their behavior. The meta-reviews in this special issue provide an assessment of the current state of this toolbox with regard to enhancing people's self-regulation. Viewed together, these reviews document the breadth and scale of investigative efforts to identify strategies that can help people regulate their health behavior (Hennessy, Johnson, Acabchuk, McCloskey, & Stewart-James, 2019; Protogerou, McHugh, & Johnson, 2019; Suls et al., 2019; Wilson et al., 2019). One key theme that cuts across these meta-reviews is that, despite an enormous amount of research activity, the experimental evidence currently available remains limited – and in many cases absent – regarding whether, when, and why intervention strategies enhance people's ability to regulate their behavior.

In delineating what is known and, in particular, what is *not* known, these meta-reviews provide investigators with a valuable road map as they work toward advancing the science of behavior change. These observations also echo concerns that led to the launch of several initiatives to enhance the design and testing of behavioral interventions, which include the Science of Behavior Change (SOBC; Nielsen, Riddle, & King, 2018; Onken, 2019), Theories and Techniques of Behaviour Change (TAT; Michie et al., 2018), the Obesity Related Behavioral Intervention Trials (ORBIT; Czajkowski et al., 2015), and the Multiphase Optimization Strategy (MOST, Collins, 2018). These initiatives have urged investigators to adopt a more mechanistic approach to intervention development, with an emphasis on specifying and experimentally testing the mechanisms hypothesised to underlie their effectiveness (see Nielsen et al., 2018 and Sheeran, Klein, & Rothman, 2017, for a more detailed description of the experimental medicine approach).

Although we second the emerging commitment to delineating the specific processes that render intervention strategies effective, it would be a missed opportunity if these efforts did not also delineate the *social and structural context* within which these processes operate (Rothman & Sheeran, 2019). To date, investigators have acknowledged that the context within which people live (e.g., their stage of life, close relationships, health status, physical environment) can and do affect their ability to regulate their health and health behaviors. Nevertheless, across these meta-reviews, there is little to no evidence of systematic engagement with how these factors might affect an intervention's effectiveness (for a complementary analysis of this issue regarding the social determinants of health and social-cognitive development, see Alcántara et al., 2019 and Miller & Fredericks, 2019, respectively). As a result, there is a disconnection between how investigators approach evaluating the

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effectiveness of self-regulatory strategies (which rest on the assumption that these strategies should help people, regardless of the contexts in which they live) and the recognition that contextual factors may modulate their effects. One reason the specification of contextual factors in the science of behavior change is underdeveloped is that the prevailing theoretical models that underlie the structure of these intervention strategies focus primarily on the *intrapersonal processes* that guide people's behavior. Thus, investigators are left with little to no guidance regarding how dispositional and contextual factors may modify people's ability to regulate their behavior.

In this commentary, we consider this issue through the lens of people's close relationships. Given the strong and enduring effects that close relationships can have on the health and health behavior of individuals, there are emerging efforts to develop models that map how the intrapersonal processes that guide people's behavior affect, and are affected by, the interpersonal interactions they have with close others (e.g., Berli, Lüscher, Luszczynska, Schwarzer, & Scholz, 2018; Lenne et al., 2019; Huelsnitz, Rothman, & Simpson, 2018). This work is predicated on the premise that the *interpersonal processes* that characterise people's close relationships not only have direct effects on people's health behavior (e.g., Berli, Lüscher, et al., 2018), but also affect how they respond to behavior change interventions. For example, a relationship partner or close friend may act in ways that inhibit or facilitate an intervention's ability to modify the mechanisms of action that underlie self-regulation (e.g., their perceived self-efficacy) or the degree to which changes in these mechanisms culminate in actual changes in behavior. Depending on the relational context, therefore, an intervention strategy may be more effective, less effective, or not even needed. In addition to moderating the manner in which people self-regulate their behavior, features of the relational context (e.g., the degree to which relationship partners are jointly engaged in behavior change) might be important targets for health behavior change interventions (e.g., Scholz, Berli, Lüscher, & Knoll, in press). With the emergence of models that can anticipate these effects, investigators will be in a much better position to determine how and when to intervene in order to promote people's ability to self-regulate their health-relevant behavior.

Situating the study of self-regulation in an interpersonal context

Interventions designed to help people manage their health behavior have overwhelmingly focused on individuals, largely independent of the social worlds in which they live. Investigators may describe a person's social connections (e.g., whether people are married or have children), but they rarely examine the implications of these relationships for an intervention's effectiveness. Thus, even when researchers are cognizant of the social worlds in which people reside, ignoring the social context in which an intervention operates indicates an assumption that a strategy that helps people, for example, to form goals to guide their behavior or to monitor themselves should produce favorable outcomes, irrespective of the other people in their lives. Relationship scientists have documented that close others can act in ways that provide support and promote a person's ability to manage their behavior more effectively, can serve as a supplementary source of self-regulation, or can act in ways that undermine a person's efforts to engage in healthy behavior (Fitzsimons, Finkel, & vanDellen, 2015; Overall & Simpson, 2013). What is less well understood is *how* these interpersonal processes interact with the thoughts and feelings that guide people's on-going health-relevant behavior.

To begin mapping the interplay between interpersonal and intrapersonal processes, we believe it is valuable to recognize that there are diverse routes through which close others could affect their partner's health behavior (see Scholz et al., in press, for an overview of dyadic behavior change strategies). Most prominent with regard to the interpersonal processes involved in behavior change are *social exchange processes*, such as social support and social control. A close other can take actions designed to *support* their partner's health-relevant behavior by, for example, making it easier for them to translate their good intentions into action (e.g., by doing errands so a partner can be more physically active; Berli, Bolger, Shrout, Stadler, & Scholz, 2018). A relationship partner can

also utilize *social control*, which includes influence strategies expressed via specific behavioral tactics intended to regulate and alter their partner's health behavior in directions that they desire (e.g., Craddock et al., 2015). Partners can, for instance, directly or indirectly control their partner's behavior by preparing healthy meals or enhancing their partner's motivation to modify their behavior by praising them for being physically active (e.g., Butterfield & Lewis, 2002).

Even though these strategies have the potential to be effective, their effectiveness is likely to depend on how well they are implemented and how the target of these efforts construes the actions enacted by their partner. For example, are these efforts perceived as supportive and perhaps a sign that their partner truly cares about them, or are these efforts perceived as controlling or manipulative? How a person feels about their partner and relationship may play a crucial role in shaping these perceptions (e.g., Scholz et al., 2013). Smokers have less success quitting smoking, for example, when they believe that their partner is critical of them for being a smoker rather than being critical of their smoking behavior (Burns, Rothman, Fu, Lindgren, & Joseph, 2014). Close others can also act in ways that deliberately sabotage their partner's efforts to modify their health-relevant behavior (e.g., Stanforth & Mackert, 2009).

Another way in which close others can affect their partner's behavior is through *modeling* (Bandura, 1989; Martire & Helgeson, 2017). According to this scenario, ongoing exposure to a close other's health beliefs or behaviour may shape one's own thoughts and actions. If, for example, a close other consistently prioritizes being physically active, this may lead one to conclude that regular physical activity is important. What distinguishes modeling from social control is that, in the case of modeling, the close other is not actively trying to modify their partner's health-relevant behavior.

Once again, however, features of the partner or relationship could affect the likelihood that modeling is an effective way to alter another person's behavior. Modeling effects may be stronger, for example, when relationship partners spend more time together or when a person feels more positively about their partner or relationship. In fact, efforts to improve the overall quality of people's interpersonal interactions and relationships could strengthen the interplay between the interpersonal and intrapersonal processes involved in behavior change. High quality relationships can also create new paths through which health behavior change can occur. For example, someone in a relationship characterised by high responsiveness (by showing understanding, validation, and care; Reis & Gable, 2015) may feel greater self-worth and self-confidence. These positive views of the self could, in turn, make it easier for individuals to react more favourably to actions taken by their partner to promote changes in their behavior and to be more resilient when grappling with challenges or setbacks.

The degree or manner in which these different interpersonal processes operate may also depend on the characteristics of other social relationships. To date, relationship researchers have primarily studied the beliefs and behavior of *romantic* partners. Most research on health-relevant behavior has followed this lead, perhaps in part because the traditionally dominant models of interpersonal influence have been grounded in this area (Simpson, Farrell, Oriña, & Rothman, 2015). However, similar interpersonal processes may also underlie the effects that close friends have on each other's health-relevant behavior as well as those observed within parent–child relationships. Furthermore, the form that interpersonal interactions take and whether or not they exert effects on health-relevant behavior likely depend on other contextual factors, such as the developmental stage of the individuals involved in the relationship (Miller & Fredericks, 2019) and the broader socio-economic environment (Alcántara et al., 2019).

Implications for the science of behavior change

Given the rich array of social contextual factors that may be operative, investigators will most likely need to focus on a limited subset of variables. Priority should be given to those factors that appear most promising, both theoretically and practically, and to pursuing evidence that reveals the manner

in which they do (or do not) alter people's health behavior, thereby modifying an intervention strategy's effectiveness. To facilitate these efforts, we have identified a set of initial steps that provide a methodological and empirical foundation upon which work in this area can be grounded.

First, we need to develop a systematic approach to capturing information about the quality and quantity of an intervention participant's interpersonal relationships. To date, studies have varied widely in what information is collected, which has precluded efforts to synthesise evidence across them. A consensus statement regarding a core set of relationship/demographic questions would provide investigative teams with valuable guidance, especially for those with limited expertise in interpersonal relationships. These questions would likely capture both the status of a person's relationship (e.g., married) as well as the quality of that relationship (e.g., closeness or interdependence).

Second, we should assess the social exchange processes that relationship partners use to shape each other's health beliefs and behavior. In studies involving individuals, this could include assessing the perceived *receipt* of social exchange processes (e.g., social support, social control, companionship) as well as perceptions of the use of interpersonal behavior change techniques (e.g., dyadic planning, joint goal setting). Although reports from individuals are informative, they should be complemented by reports from both relationship partners (i.e., romantic partners, parents and children, close friends) whenever possible. This provides an opportunity to map both the delivery and receipt of social exchange processes, allowing for the modelling of dyadic dynamics that could be relevant to the success of specific types of health behavior change. The development of standardized protocols for assessing these constructs would also give investigators the guidance needed to pursue these questions more productively.

Third, we must recognize that the strategies people use to manage their own or other's health behavior is likely to affect both individual health and well-being *and* relational outcomes, and that the course of these effects may not always be aligned. For example, strategies that yield desired behavioral outcomes (e.g., improvements in diet or exercise) may not be sustained because of the adverse effects they have on people's well-being or key relational outcomes (e.g., closeness, relationship satisfaction). Alternatively, strategies that are ineffective at changing a health behavior may at times be maintained given the favourable effects they have on relational outcomes (cf. symptom-system fit theory, Shoham, Butler, Rohrbaugh, & Trost, 2007). By tracking health, individual well-being, and relational outcomes, investigators can begin to more precisely map and model these different outcomes.

Conclusions

Faced with an array of potential intervention strategies, investigators would benefit from guidelines indicating when, for whom, and for what behaviors specific strategies are most likely to be effective in changing health-relevant behavior. As the field works together to generate the empirical evidence needed to formulate and substantiate these guidelines, it is critical that researchers attend to the intrapersonal mechanisms that underlie behavior change, such as self-regulation. While doing so, however, they also must take into account the *interpersonal* processes that govern behavior change. Intervention strategies that help people formulate goals, teach them how to translate goals into action plans, and provide tools that enable them to monitor their behavior have tremendous potential. But the true potential of these strategies will remain untapped if we continue to neglect the social context in which behavior change routinely occurs and deploy intervention strategies under conditions in which they cannot be utilized or are less (or simply not) effective. By delineating how and when close others affect people's ability or intention to regulate their health behaviors both directly and indirectly, we can provide investigators with a roadmap that can better inform decisions about which intervention strategies are likely to prove most effective, thereby advancing the science of behavior change.

Disclosure statement

No potential conflict of interest was reported by the authors.

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