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van Koningsbruggen, G.M.; Miles, E.; Harris, P.R.

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Self-affirmation and self-control

Counteracting defensive processing of health information and facilitating health-behavior change

*Guido M. van Koningsbruggen,
Eleanor Miles, and Peter R. Harris*

To promote healthy lifestyles, such as eating a healthy diet, exercising regularly, reducing alcohol consumption or quitting smoking, health educators typically rely on persuasive communication. Such communication frequently makes people aware of the risks associated with their unhealthy behaviors. For these communications to have a positive impact on long-term health and well-being, people need to accept this information and then change their behavior. However, this does not always happen. In this chapter, we consider the problem of responding adaptively to health-risk information from a self-control perspective, and discuss how a simple intervention – self-affirmation – could facilitate self-control and subsequent health-behavior change in response to this information.

We begin by considering how people respond to health-risk information from a goal pursuit perspective, and then introduce self-affirmation theory and consider its relevance for the health domain. We review research demonstrating that self-affirmation can counteract defensive processing of health information, describe mechanisms potentially underlying these effects and discuss how self-affirmation may facilitate subsequent health-behavior change. Finally, we raise some practical issues for consideration when applying self-affirmation in interventions.

Goal setting and goal striving in response to health information

Successfully pursuing and attaining health goals in response to health information requires both goal setting and goal striving (Mann, De Ridder, & Fujita, 2013). For example, to achieve a health goal, a person must first set a goal (e.g., exercising three times a week) and must then strive to achieve it (e.g., by planning how and when to exercise, and avoiding the temptation to skip exercise). The division of goal pursuit into two stages provides a framework with which to understand how health-risk information might produce behavior change. First, someone must decide whether to accept or ignore the information; second, the person must act upon this information.

We argue that each stage poses a different self-control dilemma; that is, a situation in which pursuing a valuable long-term goal requires resisting other goals with less valuable but more

immediate payoffs (e.g., Fujita & Carnevale, 2012). The first self-control dilemma arises from the immediate affective costs of confronting health-risk information. These can arise not only from perceptions of physical threat (e.g., ‘insufficient exercise can cause heart problems’), but also from psychological threat, which is “the perception of environmental challenge to one’s self-integrity” (Cohen & Sherman, 2014, p. 335). Self-integrity refers to “the perception of oneself as morally and adaptively adequate” (Cohen & Sherman, 2014, p. 334). Rather than facing up to the affective costs, people may instead avoid, deny or dismiss the information; this may be especially true among those for whom the information is most relevant and thus most threatening (Van ‘t Riet & Ruiters, 2013). Consequently, responding to threatening health information can be considered a typical self-control dilemma (i.e., a trade-off between “feeling good now” by reacting defensively and avoiding immediate negative emotions, vs. “being better-off later” by reacting adaptively and pursuing positive behavior change; cf. Agrawal & Wen Wan, 2009).

The second self-control dilemma arises at the stage of goal striving, when the person must successfully act upon their goal. Simply accepting health-risk information and setting the goal to change behavior does not guarantee this change will occur (cf. Webb & Sheeran, 2006). Indeed, goal pursuit has been characterized as a multi-stage process (Heckhausen & Gollwitzer, 1987) comprising multiple tasks that people must carry out effectively. For example, after setting a goal, a person must decide how to act, initiate action, persist in the face of setbacks and temptations, and bring their actions to a successful end. Accepting health-risk information can thus be seen as taking the first step on a journey toward behavior change; both starting this journey, and completing the journey successfully, require self-control.

We argue that self-affirmation – “an act that manifests one’s adequacy and thus affirms one’s sense of global self-integrity” (Cohen & Sherman, 2014, p. 337) – could have a dual positive effect on health behavior by facilitating self-control at each phase, thereby promoting message acceptance and facilitating behavior change. In this chapter, we will discuss research on whether, and how, self-affirmation can achieve these outcomes. Research has shown that self-affirming before receiving health information can reduce defensiveness and encourage beneficial changes in health-related cognitions and behaviors (e.g., Epton, Harris, Kane, Van Koningsbruggen, & Sheeran, 2015). Indeed, self-affirmation theory (Cohen & Sherman, 2014; Sherman & Cohen, 2006; Steele, 1988) not only provides a framework for understanding why people may not respond adaptively to health information, but also suggests how self-affirmation may induce more adaptive responding.

Self-affirmation and defensive processing of health information

Central to self-affirmation theory is the notion that people are motivated to protect and maintain their sense of global self-integrity (Steele, 1988). According to self-affirmation theory, events and information that challenge people’s sense of self-integrity evoke psychological threat and trigger a need to protect and restore self-integrity (Cohen & Sherman, 2014; Sherman & Cohen, 2006; Steele, 1988). From this perspective, health information may trigger a need to protect and restore self-integrity because messages suggesting the need to change current health-related behaviors may challenge receivers’ perceptions of adequacy. For instance, information about the health risks of insufficient exercise effectively questions a physically inactive person’s sense of being able to control important adaptive outcomes. By downplaying, minimizing or avoiding health information, people can immediately restore their threatened self-integrity without changing their unhealthy behavior. Defensive processing of health information thus provides an immediate and easy way of resolving psychological threat, but without eliminating the source of that threat.

Affirming important sources of self-worth, however, allows people to maintain self-integrity in the face of the current threat and thus may counteract any tendency to respond defensively. Self-affirmation theory suggests that this possibility exists because people are primarily concerned with maintaining their *global* sense of self-integrity, rather than maintaining their perceived self-worth in a specific domain (e.g., health). Affirmation provides a buffer against psychological threat, making people realize that their sense of self-integrity does not solely depend on the appraised implications of the provoking threat (Sherman & Cohen, 2006). Importantly, it has been argued that it is best if the source of self-worth is not related in any way to the focal threat, because an affirmation related to the threat may be counter-productive, emphasizing people's identity concerns and thereby increasing rather than decreasing defensiveness (Sherman & Cohen, 2006).

How can we encourage people to self-affirm? There are many ways to induce self-affirmation (e.g., see McQueen & Klein, 2006). These include recalling past acts of kindness, completing value scales, providing positive personality feedback and completing questions that focus people's minds on important self-values or characteristics. In the research discussed in this chapter, self-affirmation is induced experimentally by allowing participants to reflect on important personal values or attributes.¹ Participants in the control conditions are usually instructed to reflect on relatively unimportant personal values or attributes. The commonest experimental induction of self-affirmation asks participants to select an important personal value (e.g., a sense of humor, relationships with family and friends) and to write about why this value is important to them (Cohen & Sherman, 2014).

Counteracting defensive processing of health information through self-affirmation

The application of self-affirmation theory to the processing of health-risk information has attracted increasing research attention over the last 10–15 years. Effects of self-affirmation have been investigated in the context of various health issues (e.g., alcohol consumption, type 2 diabetes, physical activity, unsafe sex and smoking), and across a range of variables (e.g., message acceptance, risk perception and health behavior). In most of these studies, participants are randomly assigned to either a self-affirmation or control condition *before* being exposed to relevant health information. After reading the health information, participants complete dependent measures assessing how they process, evaluate and respond to the message.

Overall, there seems to be encouraging evidence that self-affirmation can counteract defensive processing of health information, thus enabling people to consider this information more open-mindedly and act upon it if it is persuasive. For instance, when affirmed, people are less likely to avoid health-risk information. Participants in one series of studies watched a video about a (fictitious) disease. Subsequently, they were able to choose whether to receive information about their risk of suffering from that disease (Howell & Shepperd, 2012). Compared to participants in a control condition, self-affirmed participants – who wrote about a personally important trait before watching the video – were more likely to choose to receive feedback about their medical risk, even after being told that the disease would be untreatable or that a positive outcome would result in an additional physical examination. Another study, with moderately heavy alcohol consumers, demonstrated that after reading a message linking alcohol to breast cancer, participants who had not self-affirmed displayed an attentional bias away from the threatening words in the health message (Klein & Harris, 2009), suggesting defensive avoidance of the information. However, those who had affirmed before reading the health information showed a bias *toward* the threatening words, suggesting that self-affirmation increased their

allocation of attention to the information. In a similar vein, self-affirmation has been shown to increase the accessibility of threat-related cognitions among coffee drinkers after reading health information linking caffeine consumption to health problems (Van Koningsbruggen, Das, & Roskos-Ewoldsen, 2009).

In addition to reducing information avoidance, self-affirmation also counteracts defensive evaluations of threatening health information. In a study that presented participants at risk for diabetes with health-risk information about type 2 diabetes (Van Koningsbruggen & Das, 2009), participants who reflected on an important value before reading the information evaluated it as being less distorted, exaggerated and extreme compared to those who were not given an opportunity to self-affirm. In a field study, self-affirmation decreased sunbathers' tendency to evaluate a leaflet on skin cancer and sun safety as overblown, exaggerated, manipulative, and straining the truth (Jessop, Simmonds, & Sparks, 2009). Other studies have confirmed that self-affirmation increases agreement with conclusions presented in health information (e.g., Sherman, Nelson, & Steele, 2000). Importantly, self-affirmation not only facilitates general message acceptance, but has also been found to increase acceptance of the personal relevance of the health information. For instance, in response to information about the risk of developing breast cancer from excessive alcohol consumption, self-affirmed heavier alcohol consumers perceived their risk for breast cancer to be higher than did non-affirmed heavier alcohol consumers (Harris & Napper, 2005). In another study, self-affirmation increased participants' feelings of vulnerability to developing health problems due to their caffeine consumption (Klein, Harris, Ferrer, & Zajac, 2011).

Another defensive process triggered by threatening health information is the need to defensively minimize the experience of negative affect triggered by the information (Van 't Riet & Ruiters, 2013). Consistent with this, several findings suggest that self-affirmation appears to make it easier to acknowledge the immediate affective implications of health information. For instance, self-affirmed sunbathers reported feeling more afraid, frightened, worried and uncomfortable while reading about skin cancer and sun safety (Jessop et al., 2009). Likewise, self-affirmed smokers rated graphic warning labels as more threatening and unpleasant (Harris, Mayle, Mabbott, & Napper, 2007), and female alcohol consumers tended to feel more fearful, anxious and worried after reading about risks related to alcohol consumption (Harris & Napper, 2005). Self-affirmation has also been shown to increase the experience of anticipated regret – a negative emotion demonstrated to predict adaptive health behavior – in response to health-risk information (Van Koningsbruggen et al., 2016).

Taken together, such studies suggest that self-affirmation enables people to deal with the self-control dilemma posed by threatening health information adaptively: it enables them to confront negative information and accept the conclusions and personal relevance of persuasive information and the negative emotions it may arouse.

How does self-affirmation counteract defensive processing?

The research discussed so far provides evidence that self-affirmation can improve self-control when faced with persuasive health-risk information. What are the mechanisms through which self-affirmation produces these beneficial effects on defensive processing? While a comprehensive account of how self-affirmation influences responses to health information is lacking, a general account of the mechanisms that may drive such beneficial effects of self-affirmation has been proposed by Sherman and colleagues (Sherman, 2013; Sherman & Hartson, 2011). According to their three-stage model, self-affirmation first increases the availability of psychological resources to cope with a threatening event. As a result, people are better able to confront the threat and to see it “from a broader perspective” (Sherman & Hartson, 2011, p. 139).

This, in turn, they argue, uncouples the threat from the self, reducing its potential impact on people's overall self-evaluation. We consider this model and its supporting evidence, and how it may help us understand how self-affirmation works in the domain of health.

Does self-affirmation boost the availability of self-resources?

To cope with a threat, people need self-resources: “those objects, personal characteristics, conditions, or energies that are valued by the individual or that serve as a means for attainment of these objects, personal characteristics, and energies” (Hobfoll, 1989, p. 516). A problem, though, is that threats tend to hijack people's focus and attention and tax certain psychological resources, making other self-resources they could use to cope with the threat less accessible (Sherman, 2013). However, self-affirmation manipulations are intentionally designed to make people aware of important and valued self-aspects. By reflecting on important personal qualities, cherished values or attributes, people are reminded of resources that they could use to deal with the threat (Sherman, 2013; Sherman & Hartson, 2011). This inherent feature of self-affirmation manipulations thus likely boosts the perceived availability of self-resources.

Empirical evidence for this proposition comes from research showing that self-affirmation can counteract effects of psychological resource depletion (Schmeichel & Vohs, 2009). Psychological resource depletion or “ego-depletion” refers to the phenomenon that acts of self-control consume energy and deplete resources required for subsequent self-control (Baumeister, Vohs, & Tice, 2007). Studies by Schmeichel and Vohs (2009) found that self-affirmation eliminated this effect, supporting the resource hypothesis. In one study, participants first completed a writing task designed to be either depleting or non-depleting (the depleting task required participants to inhibit their use of certain letters, while the control task did not include this requirement), and then either self-affirmed or did not self-affirm. Next, self-control was assessed by measuring how long participants were willing to hold their hand in cold water. In the no-affirmation condition, the researchers found the typical ego-depletion effect (non-depleted participants kept their hand in the cold water longer than depleted participants). However, this effect was eliminated in the self-affirmation condition: the initial writing task did not decrease performance on the subsequent self-control task. Thus, self-affirmation enabled people to overcome the depletion of their resources.

Applying these observations to the health domain, appraising relevant health information might consume energy and deplete resources available to respond adaptively to health information (e.g., see Agrawal & Wen Wan, 2009). Manipulations of self-affirmation may, however, equip people with the self-resources to cope with the threatening health information, leading to a reduction in the need to respond defensively (Sherman & Hartson, 2011). Self-affirmation may also equip people with the resources required to carry out a health behavior and persist with behavior change even in challenging circumstances.

Do self-affirmed people perceive the threat from a broader perspective?

Sherman and colleagues argue that the increased availability of self-resources enables self-affirmed people to view threats in a different way, which might further explain why self-affirmation reduces defensive responses. With a wider range of self-resources available to cope with a threat when self-affirmed, threats should not loom disproportionately large, encouraging people to see a threat with greater perspective and in the context of the “big” picture (Cohen & Sherman, 2014; Critcher & Dunning, 2015; Sherman, 2013; Sherman & Hartson, 2011). Recent studies support the idea that self-affirmation can change people's perspective, for instance by promoting

higher levels of mental construal (Schmeichel & Vohs, 2009; Sherman et al., 2013; Wakslak & Trope, 2009). Higher levels of construal allow people to consider the gist or primary features of information, which makes them represent information in an abstract, schematic fashion that emphasizes what is important. In contrast, lower levels of construal refer to more concrete, specific features of the information that fail to differentiate what is important from what is secondary (Trope & Liberman, 2003). Importantly, higher levels of construal enhance people's sensitivity to the broader, goal-relevant implications of their actions and, in turn, have been found to promote self-control (e.g., Fujita & Carnevale, 2012). A recent study confirmed this in the context of health information processing by showing that high (vs. low)-level construal promoted acceptance of skin cancer health messages (Belding, Naufel, & Fujita, 2015).

One way in which studies have assessed participants' construal level is by asking them to complete the Behavioral Identification Form (Vallacher & Wegner, 1989). In this task, participants see a list of behaviors and choose between two alternative descriptions of each behavior: one option describes the behavior (e.g., "eating") in terms of the means used to accomplish it (e.g., "chewing and swallowing"), while the other option describes it in terms of the end that the behavior accomplishes (e.g., "getting nutrition"). Across several studies (Schmeichel & Vohs, 2009; Sherman et al., 2013; Wakslak & Trope, 2009), self-affirmed participants have demonstrated a preference for describing behaviors in terms of the ends they accomplish, suggesting that self-affirmation induces a higher level of construal (i.e., more abstract representations of events). Furthermore, consistent with the idea that both the increased availability of self-resources and increase in construal level contribute to improved self-control, one experiment demonstrated that affirming the self at a higher level of construal (i.e., writing about *why* one pursues an important value) eliminated a typical ego-depletion effect, whereas self-affirming at a lower level of construal (i.e., writing about *how* one pursues an important value) did not (Schmeichel & Vohs, 2009, Study 4).

Together, these findings suggest that self-affirmation can promote a broader, more abstract representation of events. In a similar vein, self-affirmation may encourage people to appraise threatening health information at a higher level of mental construal and "to engender a big picture approach, leading to schematic, representations that emphasize superordinate, defining elements" (Wakslak & Trope, 2009, p. 931). Such a perspective may make self-affirmed people more sensitive to the broader, longer-term goal-relevant implications of their current health behavior, further undermining any tendency to respond defensively to the health information or tendency to not act on it.

Does self-affirmation uncouple the threat from the self?

The third and final mechanism proposed by Sherman and colleagues is that self-affirmation 'uncouples' the threat from the self. Specifically, they argue that the increased availability of self-resources, and the change in threat-perspective, make an individual's self-evaluation less dependent on, or even independent from, the domain under threat. This enables the individual to evaluate the focal threat in an unbiased way. Empirical evidence for uncoupling comes from studies demonstrating weaker correlations between self- and threat-related variables following self-affirmation (Sherman & Hartson, 2011). There is some evidence that this mechanism is applicable in the context of self-affirmation and health. In one study, for instance, a positive relationship between risk level (i.e., a self-related variable) and derogation of the health message (i.e., a threat-related variable) was found among non-affirmed participants (Van Koningsbruggen & Das, 2009). However, among self-affirmed participants, risk level was unrelated to health message derogation. Sherman and colleagues (Sherman, 2013; Sherman & Hartson, 2011) interpret such a finding as evidence that self-affirmed participants' evaluations of health information were less strongly or no longer tied to (or uncoupled from) the self. The uncoupling of the threat from

the self may enable people to evaluate the informational value of the health information without immediate concerns about its impact for self-integrity.

In summary, this three-stage model may help us to better understand how self-affirming enables people to respond more adaptively to threatening health information. However, it is important to bear in mind that most of the empirical evidence discussed in this section comes from studies outside the health domain. In addition, these studies only employed value-affirmations; the extent to which the findings generalize to other self-affirmation manipulations thus remains open. An important avenue for future research would thus be to investigate the role of these mechanisms in the context of self-affirmation and health information processing. Furthermore, in line with the suggestion of Sherman and Hartson (2011), these studies should also aim to directly link the proposed mechanisms to outcome variables that capture defensive responses to health information (e.g., information avoidance, message derogation). Such evidence would convincingly demonstrate that the processes discussed in this section explain the positive effects of self-affirmation on health information processing.

Self-affirmation and the subsequent facilitation of health-behavior change

Once they have accepted information about their health, self-affirmed people should be more motivated and readier to adopt behaviors recommended in persuasive health messages, and perhaps better able to carry out these behaviors. Indeed, there is evidence that in conjunction with a strong and persuasive message, self-affirmation manipulations can produce beneficial changes in predictors of health behavior, such as attitudes toward the behavior, perceived behavioral control, self-efficacy and response-efficacy (for a review, see Harris & Epton, 2009). Studies have also demonstrated that self-affirmation can promote intentions to adopt behaviors recommended in the health information and actual behavior change.

Self-affirmed participants have been found to express stronger intentions to reduce cigarette smoking (Harris et al., 2007) and alcohol consumption (Harris & Napper, 2005), and to adopt recommendations regarding physical activity (Cooke, Trebaczyk, Harris, & Wright, 2014) and a healthy diet (Van Koningsbruggen et al., 2016). Although fewer studies have investigated the impact of self-affirmation on actual health behavior following exposure to persuasive health information, evidence is accumulating that it can indeed promote changes in behavior. Participants in one study, for instance, were offered an opportunity to self-affirm by reflecting on past acts of kindness or not before reading about the importance of eating sufficient fruit and vegetables (Epton & Harris, 2008). Relative to non-affirmed participants, self-affirmed participants increased their fruit and vegetable consumption during the following week as assessed with a validated diary measure (also see Harris et al., 2014; Van Koningsbruggen et al., 2016). In another study, participants read about the health risks of alcohol consumption (Armitage, Harris, & Arden, 2011). Self-affirmed participants reduced their daily alcohol consumption as measured with a validated questionnaire one month later, whereas control participants did not. Self-affirmation has also been shown to positively influence other health behaviors such as smoking, safe sex, sun tanning and physical activity (for a recent overview, see supplementary materials in Epton et al., 2015).

Overall, while there are some inconsistencies between studies in which dependent measures are influenced by self-affirmation (e.g., see Harris & Epton, 2009, for a review), two recent meta-analyses found that self-affirmation has a positive effect on responses to threatening health information (Epton et al., 2015; Sweeney & Moyer, 2015). For instance, Epton and colleagues (2015) found small but reliable positive effects of self-affirmation on health message acceptance ($d_+ = .17$, $CI = .03-.31$; across 34 studies, $N = 3,433$), intentions to change ($d_+ = .14$,

$CI = .05-.23$; across 64 studies, $N = 5,564$), and subsequent health behavior ($d_+ = .32$, $CI = .19-.44$; across 46 studies, $N = 2,715$). Overall, therefore, the small act of self-affirming appears not only to enable people to accept health-risk information, but also facilitates goal striving.

Self-affirmation may facilitate change indirectly by encouraging more open-minded appraisal of persuasive health messages otherwise undermined by self-integrity concerns (Cohen & Sherman, 2014; Sherman, 2013). Indeed, decreases in health message derogation following self-affirmation have, for instance, been found to mediate the effect of self-affirmation on intention formation (Van Koningsbruggen & Das, 2009). However, self-affirmation could also facilitate health-behavior change directly, by improving self-control at the goal-striving stage. We now consider research that sheds some light on how self-affirmation may help people to achieve successful behavior change, both indirectly and directly.

Boosting anticipated regret

One way in which self-affirmation may facilitate goal pursuit is by changing how participants feel about the goal. For example, one recent study showed that anticipated regret and intentions acted as serial mediators linking self-affirmation and behavior (Van Koningsbruggen et al., 2016). Specifically, results suggested that self-affirmation reduced participants' tendency to resist the experience of anticipated regret in response to a health message promoting fruit and vegetable consumption (i.e., self-affirmation reduced the defensive minimization of negative affect). This, in turn, was related to stronger intentions to adopt the recommended behavior and these intentions translated into healthier behavior in the week after the intervention. Self-affirmation thus indirectly promoted healthier behavior by influencing anticipated regret that, in turn, facilitated intention formation that subsequently resulted in healthier behavior. Thus, one of the ways in which self-affirmation facilitates health-behavior change appears to be by influencing people's anticipated emotions about their actions.

Facilitating effective planning

Another way in which self-affirmation may encourage subsequent health-behavior change is by facilitating the formation of implementation intentions. Compared to regular goal intentions (e.g., 'I intend to drink less alcohol'), implementation intentions are more detailed, specifying the when, where and how of what one will do to reach a goal (e.g., 'If I order a drink in the pub tonight, then I will order a coke!'). Forming such if-then plans has been shown to facilitate goal attainment above and beyond regular goal intentions (Gollwitzer & Oettingen, 2013). Because self-affirmation has been shown to promote specific preparatory health behavior (e.g., purchasing condoms after watching an AIDS educational video), Ferrer, Shmueli, Bergman, Harris, and Klein (2012) proposed that self-affirmation might facilitate the formation of implementation intentions. In their study, after reading a message about the risk of breast cancer from alcohol consumption, female alcohol consumers were invited to write down any steps they would be willing to take to reduce their alcohol consumption in the following week. The responses were scored on whether the steps specified components related to implementation intentions (e.g., location and time of drinking). These scores were combined such that higher scores indicated greater formation of implementation intentions. Compared to participants in a control condition, self-affirmed participants (but only those who felt relatively positive after reading the message) showed greater formation of implementation intentions for reducing alcohol consumption. Whether this resulted in actual behavior change remains an open question, as this study did not include a follow-up measure of behavior.

As pointed out by Ferrer and colleagues (2012), these findings are nevertheless promising as implementation intentions induced by self-affirmation may facilitate subsequent health-behavior change in various ways. For instance, implementation intentions have been found to help people start behaving healthily and to protect their initial goal strivings from disruptive internal (e.g., ego-depletion) and external (e.g., temptation) influences (see Gollwitzer & Oettingen, 2013, for a review). This latter feature of implementation intentions appears to be highly relevant for many of the health behaviors targeted in self-affirmation and health studies (e.g., eating healthily, exercising regularly, drinking less alcohol) as performance of these behaviors is easily disrupted by tempting cues in the environment (e.g., seeing a delicious cake in the shop window of a bakery or being invited for drinks when one had planned to go to the gym). Thus, affirmation-induced implementation intentions might improve self-control in the goal-striving phase. It should be noted, however, that while self-affirmation may facilitate the formation of implementation intentions, research combining experimental manipulations of both self-affirmation and implementation intentions (i.e., explicitly asking participants to form implementation intentions after self-affirming rather than measuring whether participants spontaneously do so) has produced both positive (Harris et al., 2014) and negative results (Jessop, Sparks, Buckland, & Harris, 2014) on measures of health behavior.

Dealing with temptations

Self-affirmation might also help people to navigate through tempting environments by facilitating the creation of cognitive associations between temptations and long-term health goals. People who spontaneously think about their long-term health goals (e.g., dieting) upon confrontation with temptations (e.g., being offered a tasty, but high-calorie food) have been found to behave more in line with those goals, while people who lack such temptation-goal associations are less successful in attaining their health goals (Mann et al., 2013). Interestingly, higher-level construals have been found to facilitate the cognitive activation of longer-term goals by temptations (Fujita & Sasota, 2011). Given that self-affirmation can heighten construal levels (Schmeichel & Vohs, 2009; Sherman et al., 2013; Wakslak & Trope, 2009), higher construals induced by self-affirmation may facilitate the creation of beneficial temptation-goal cognitive associations following health message exposure. Although this has not yet been investigated empirically, we propose this could be a further route by which self-affirmation contributes to successful self-control in the goal-striving phase.

This section highlights some of the ways through which self-affirmation, after reducing defensive responses to health information, may facilitate subsequent health-behavior change. However, self-affirmation is likely to influence many other variables and processes that may in turn influence the pursuit and attainment of health goals. So far, most self-affirmation and health studies have focused on reflective processes of behavior change (e.g., intention formation), but the pursuit of health goals is influenced by (often conflicting) impulsive processes as well (Mann et al., 2013). Whether and how self-affirmation influences impulsive processes and its interplay with reflective processes are important issues for future research.

Self-affirmation interventions in practice

Should policymakers and practitioners thus be encouraged to use self-affirmation as a tool to increase the effectiveness of health promotion efforts? Here we discuss some practical considerations for those thus encouraged. First, typical self-affirmation manipulations, such as writing about an important value, are relatively time-consuming and require motivated participants (Jessop et al., 2009). This could make the use of self-affirmation in real-world

contexts challenging, particularly in mass communications. Few attempts to develop and test briefer means of self-affirming have been published to date. For example, Jessop and colleagues (2009) integrated a self-affirmation task into a health promotion leaflet, on skin cancer and sun safety, given to sunbathers on a beach. Participants were asked to indicate whether a list of eight positive traits (e.g., enthusiastic, hardworking, open-minded) was true of them, and then read that if any of the traits applied to them, they were the 'ideal candidate' to adopt the recommendations described in the remainder of the leaflet. This brief task positively influenced several variables related to health-behavior change, and more importantly, successfully promoted sunbathers' requests for a free sample of sunscreen.

Armitage and colleagues (e.g., 2011) tested the effectiveness of a brief method involving forming a self-affirming implementation intention. Participants were presented with the sentence "If I feel threatened or anxious, then I will. . .", and asked to select one of four options to complete this sentence (e.g., ". . .think about the things I value about myself"). They were asked to write down the self-affirming implementation intention in full before reading a health message designed to reduce alcohol consumption. Results demonstrated that this brief method successfully decreased participants' alcohol consumption as assessed after one month.

Although the findings of Jessop et al. (2009) and Armitage et al. (2011) are encouraging, we note that not all attempts to develop brief self-affirmations have been successful (Dillard, McCaul, & Magnan, 2005). More research is needed to replicate, develop and investigate the effectiveness of brief self-affirmation manipulations that can be more easily used in applied contexts.

Other considerations are the timing of the self-affirmation and participants' awareness of its purpose, both of which have been shown to influence the effectiveness of self-affirmation in reducing defensiveness. Critcher, Dunning, and Armor (2010) demonstrated that self-affirmation was only effective when induced before participants initiated a defensive response. In the context of health information processing, people are thus most likely to profit from self-affirmation when they affirm before being confronted with the threatening health message. Similarly, Sherman and colleagues (2009, Study 3) demonstrated that self-affirmation did not reduce defensiveness when participants were explicitly told about its purpose (i.e., that the study was investigating how the self-affirmation manipulation influenced health beliefs), although this effect is eliminated when participants freely choose to affirm or not (Silverman, Logel, & Cohen, 2013). One should thus take care in how one presents the self-affirmation task. People might perceive the task as a "threatening act of control or stigmatization" (Cohen & Sherman, 2014, p. 360) if they are explicitly made aware of its purpose and feel forced to complete it. This could induce reactance and thus decrease the effectiveness of the self-affirming activity (Silverman et al., 2013).

One should also bear in mind that self-affirmation does not result in unconditional acceptance of health messages, but rather enables people to evaluate information more carefully and judge its informational value more objectively (e.g., Sherman, 2013). Consequently, self-affirmation could result in rejection of messages if they contain weak or irrelevant arguments (Harris & Epton, 2009). Indeed, self-affirmation has been found to increase adaptive responses to strong, but not weak health messages (Klein et al., 2011). One should thus make sure to present people with strong and persuasive health messages; self-affirmed people may more readily detect flawed arguments.

Finally, consideration should be given to participants' levels of risk. Theoretically, only those for whom a health message is personally relevant will experience it as threatening and thus benefit from self-affirmation. Indeed, some studies suggest that self-affirmation is particularly beneficial for people at higher levels of risk (e.g., Harris et al., 2007; Harris & Napper, 2005; Van

Koningsbruggen & Das, 2009); that is, those who are most in need of health-behavior change (but see Klein & Harris, 2009; Zhao, Peterson, Kim, & Rolfe-Redding, 2014, for exceptions). At lower levels of risk, however, self-affirmation might have unwanted effects. For instance, self-affirmation has been shown to decrease intentions and willingness to take an online diabetes risk test among participants at lower risk (Van Koningsbruggen & Das, 2009), and to decrease favorable responses to warning labels among occasional smokers (Zhao et al., 2014). A recent meta-analysis did not find that risk level moderated the impact of self-affirmation on people's responses to health information; however, the authors concluded that this result should be interpreted with caution because of the small number of tests (Epton et al., 2015). More research is clearly needed on the potential moderating role of risk level. From a practical point of view this is also very important as many health promotion efforts, especially large-scale ones, will reach populations that are likely to vary in their level of risk for the targeted health issue (Zhao et al., 2014).

Conclusion

Accepting personally relevant health information and changing one's behavior accordingly is valuable for long-term health and wellbeing. However, to do this, people may need to override or alter a tendency to respond defensively to such information, induced by the immediate threat it presents to their global perception of self-integrity, and then need to successfully act on this information. Responding adaptively to threatening health information thus requires self-control. Self-affirmation appears to be a promising tool for improving self-control and thus reducing defensive processing of health information, thereby enabling action. As a result, self-affirmation may be a powerful facilitator of health-behavior change.

We have considered some mechanisms that may drive these beneficial effects of self-affirmation, but also note that more empirical research on these mechanisms in the health domain is needed. We also note that to further increase the applied potential of self-affirmation for policymakers and practitioners, more work is needed to develop brief self-affirmation manipulations that can be easily used in real-world contexts.

While much remains to be discovered about self-affirmation and self-control in the health domain, we hope to have provided readers with a useful overview of current insights about this topic, which we believe to be of both theoretical and practical significance in understanding how people deal with relevant but threatening health-risk information.

Note

1 Researchers have also begun to examine individual differences in the tendency to engage in self-affirmation, including how these correlate with and predict responses to health information (e.g., Harris et al., 2017; Pietersma & Dijkstra, 2012; Taber et al., 2015). This work is in its early stages and coverage is beyond the scope of the current chapter.

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