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Article:

The impact of self-affirmation on health cognition, health behaviour and other health-

related responses: A narrative review

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Abstract

There is growing evidence that self-affirmation – the process of reflecting upon cherished values or attributes – may have implications for health. Postulated effects range from reducing the defensive resistance to unwelcome health-risk information to ameliorating the physiological response to stress. In this, the first detailed review of the literature on self-affirmation and health, we summarise what is known. Self-affirming can increase acceptance of unwelcome health-risk information, especially among those at greatest risk. Self-affirmed participants typically also report more intention to change behaviour post-message. There is evidence that certain effects of self-affirming may endure. Self-affirmation has also been shown to have beneficial effects on the response to stress. There is, however, currently only limited evidence of actual health behaviour change following self-affirmation. We discuss reasons for this and consider key research questions for the next phase of research.

Despite decades of attempts to encourage people to adopt healthier lifestyles by, for example, taking more exercise, eating healthily, and drinking alcohol only in moderation, rates of obesity, heart disease and other chronic "diseases of lifestyle" continue to rise worldwide. This has led to a redoubling of efforts to encourage those whose behaviour puts them at risk of future ill health to change their behaviour. However, many such appeals fall at the first hurdle; they fail to persuade. There is considerable evidence that people – especially those most at risk – resist attempts to persuade them of the need to change. Responses range from simply trying to avoid or ignore material containing unwelcome information to finding grounds to reject it by paying it close critical attention (Blumberg, 2000; Jacks & Cameron, 2003). Such strategies achieve short-term benefits, such as reducing anxiety or the perceived need to make effortful and time-consuming changes (Leventhal, 1970), but at the risk of costs to health and life expectancy.

Traditionally, message advocates respond to such resistance by refining the message, perhaps by tailoring it to particular subgroups of respondents, providing personalised data or encouraging the use of imagery and affect (Cameron & Chan, 2008; Dijkstra, 2008). One long-established method is to attempt to elicit in the target audience a strong negative emotional reaction, such as fear, at the future health consequences of maintaining current behaviour, as some degree of threat or fear is seen as a precursor to taking action (Witte, 1992); however, fear can enhance as well as reduce resistance (Ruiter, Abraham, & Kok, 2001). Other approaches involve persuading people that the targeted behaviour is feasible as well as desirable (Ruiter, et al., 2001). The goal of all of these attempts is to persuade those who are at risk of the need to change and to increase their motivation to try.

This paper reviews evidence concerning a method – self-affirmation – that takes a different approach to the problem of promoting motivation to change. Rather than requiring changes to persuasive materials, self-affirming – which involves reflecting upon one's important values or cherished attributes – is hypothesised to promote more open-minded and balanced appraisal of existing materials. Self-affirmation theory (Steele, 1988) provides both a theoretical framework for understanding why people may resist unwelcome but potentially vital information and suggests methods for overcoming such resistance. It is, therefore, of both theoretical and applied relevance.

Recent reviews (Aronson, Cohen & Nail, 1999; McQueen & Klein, 2006; Sherman & Cohen, 2006) have presented evidence that self-affirming reduces biased responding to uncongenial information in a wide range of domains. However, as yet no review has been specifically devoted to its impact on health and health-related cognition and behaviour, even though enough evidence has now accumulated to justify a review of what we know and an appraisal of what we need to find out. In this, the first of two companion papers, we therefore provide an up to date summary of the published literature on self-affirmation and health-related responding, focussing on two key questions: (1) does self-affirming increase acceptance of relevant health-risk information, (2) subsequently, do self-affirmed participants show greater interest in, motivation for and likelihood of behaviour change? This review is intended to provide the specialist reader with a detailed summary of the literature suitable for their purposes and the non-specialist reader with a grounding in the state of the literature on the health effects of self-affirming.

Self-Affirmation Theory

Self-affirming is the process of reflecting upon one's cherished values, actions or attributes. It functions to restore or reinforce the person's sense of who they are and

what they stand for in the face of perceived threats to their identity. It can be used to defend against forthcoming identity threats (much like a psychological "inoculation") or to repair damage caused by threats that have already occurred (Sherman & Cohen, 2006).

At the heart of Self-Affirmation Theory is the notion of "self-integrity", defined by the theory's author, Claude Steele, as the experience of the self as "adaptively and morally adequate" (Steele, 1988, p. 262). The theory is explicitly motivational. It proposes that people are strongly motivated to maintain self-integrity. This is relevant to health information (such as health warnings) because, according to the theory, people often perceive such information as threatening their sense of being moral, competent and worthy (self-integrity).

People respond to such threats in various ways. For example, a smoker who experiences a threat to her self-integrity from information about the health risks of smoking might resist potential harm by denigrating the information or making renewed attempts to quit. These responses would have very different implications for her subsequent health behaviour, but equivalent consequences for her immediate sense of self-integrity (as both, in different ways, reduce the perceived threat). However, Self-Affirmation Theory identifies a third path to threat reduction. Here, self-integrity is restored by affirming sources of self-worth that are important to the person's identity but unrelated to the threat. For example, the smoker may remind herself of her strengths as a mother or agree to take part in a time-consuming act of charity (Steele, 1975). Consequently, in the context of other valued self-concepts, being a smoker becomes less threatening to her self-integrity. This is not a process of distraction but a means of "offsetting" or balancing the threat to self-integrity from the health-risk information by affirming some other, at least equally important, aspect

of identity. This is possible, according to Self-Affirmation Theory, because people are concerned primarily with maintaining their overall sense of self-integrity rather than resolving each and every provoking threat (Steele, 1988).

An intriguing consequence of this flexibility in response to psychological threat is that salient, self-affirming thoughts should reduce the pressure to diminish the threat in other self-threatening information and thereby promote the ability to think objectively (Steele, 1988, p. 290). That is, someone who self-affirms has available to them the perspective and resources to better confront a self-threat (Sherman & Cohen, 2006).

The hypothesis that self-affirming can promote more objective appraisal of (otherwise) threatening material has obvious appeal to researchers interested in persuasion in the health domain, where the messages typically contain important but unwelcome information and resistance is common, especially among more at-risk groups (Freeman, Hennessy, & Marzullo, 2001; Kunda, 1987; Liberman & Chaiken, 1992). Self-affirmation manipulations raise the intriguing prospect of removing an important early obstacle to health behaviour change.

Self-affirmation and health

As a theory for understanding and promoting health-behaviour change, Self-Affirmation Theory is a relative newcomer; it was some 10 years after Steele's article that the first empirical paper testing whether it promoted greater objectivity in the health domain was published (Reed & Aspinwall, 1998). Recent years have seen growing interest; using procedures similar to those employed by McQueen and Klein (2006) we found 18 published and in press papers comprising 22 studies testing the effects of self-affirming on health-related cognition, affect and behaviour.

Most of the articles use a common "two-study" paradigm in which participants are randomly assigned to self-affirm or to a control condition and then subsequently exposed to health-risk information, typically in the guise of an unrelated experiment. Indeed, it appears to be critical to the effectiveness of self-affirming that participants are unaware of the effects of self-affirming on their subsequent judgments and therefore of the link between the two studies (Sherman, Cohen et al., in press). This is one key way in which self-affirming as used here differs from self-affirming as popularly understood as a means of explicitly boosting self-regard (Sherman, Cohen et al., in press).

The dominant paradigm therefore involves testing the preventive or prophylactic effects of self-affirming, as participants have yet to be made aware of the threat (the health-risk information) when they self-affirm. Given its inherent flexibility, there are many ways of self-affirming (Steele, 1988). Some are esteem based (for example, providing bogus feedback on a test; Steele, Spencer & Lynch, 1993). However, most of the studies reviewed here have used some version of a values exercise in which those in the self-affirmed condition reflect upon a core value (e.g., by completing a relevant values scale or writing a brief essay on their most important value) whereas control participants complete a less relevant values scale or write about why their least important value might be important to someone else. (For more on methods of self-affirming, see McQueen & Klein, 2006.) Self-affirmation manipulations are designed to (1) make a central and positive aspect of the self-concept salient, (2) provide a reminder of "who you are" and (3) offer reassurance that self-worth can be derived from other aspects of the self than the threatened one (Napper, Harris & Epton, 2008; Sherman & Cohen, 2006).

Messages have occasionally communicated fictitious health-risks (e.g., Crocker, Niiya & Mischkowski, 2008) but have mainly targeted genuine health threats. The health-risk information is typically a persuasive message (presented as articles, leaflets, images or by video) designed to threaten at-risk participants, who are expected to respond to it in a biased way by, for example, showing less acceptance of the message or its personal relevance (Table 1). Because this response typically serves to lessen the threat, it is often described as "defensive" (Good & Abraham, 2007). Researchers assume that self-affirming has reduced defensiveness when at-risk, self-affirmed participants show more evidence of accepting or responding to the message than their non-affirmed counterparts. In most studies researchers also assume the message was threatening from this difference in response, rather than measuring threat direct.

As used here, at-risk describes a property of the individual as, for example, judged by an impartial assessment of the risks involved in their behaviour, such as their reported alcohol or cigarette consumption. Whether the individual shares this perception is a different matter; downplaying personal relevance or susceptibility is a common defensive strategy. Indeed, based on the above theorising, one effect of self-affirming should be to improve the correspondence between risk assessments and personal judgments.

In terms of Self-Affirmation Theory, the predicted beneficial effects of self-affirming are clear (and potentially limited to) those who should find the message threatening (i.e., at-risk participants). However, this raises difficulties when interpreting null effects, as failure to obtain significant effects of self-affirmation may stem from (1) a lack of defensiveness among non-affirmed participants (2) the arguments being weak or otherwise unpersuasive (3) insufficient power to detect

effects or (4) failure of the manipulation to induce self-affirmation. As few studies include manipulation checks (because completing these may induce self-affirmation in control participants – McQueen & Klein, 2006; Schwinghammer, Stapel & Blanton, 2006) identifying manipulation failure is a potential problem. However, the authors of only two published studies – Fry and Prentice-Dunn (2005) and Dillard, McCaul and Magnan (2005) – interpret their findings as failures. Note also that self-affirmation is hypothesised to induce more open-minded appraisal, not persuasion: it should therefore lead to rejection of weak or irrelevant information. It is not thought to work by trivialising the threat (e.g., Koole, Smeets, van Knippenberg, & Dijksterhuis, 1999) or increasing suggestibility (e.g., Correll, Spencer & Zanna, 2004).

In part one we review the current published literature that has assessed how self-affirming affects the acceptance and processing of health-risk information and, in part two, interest in and likelihood of relevant health-behaviour change. In addition, researchers have begun to assess the potential effects of self-affirming on responses to stress and other health-related processes and we review that research here too.

Part one: message acceptance

Overall, there is good evidence that self-affirming promotes greater general and personal acceptance of health-risk information, and less message derogation.

Researchers have used direct questions (e.g., "to what extent do you think the conclusion of the article was justified on the basis of existing research findings?", Crocker, et al., 2008) or inferred acceptance from belief items (e.g., "I believe that women should take steps to reduce their daily caffeine consumption in order to prevent the development of [Fibrocystic Breast Disease]", Reed & Aspinwall, 1998). Self-affirming increases acceptance on such measures: for example, among coffee

drinkers reading about the health risks of caffeine (Sherman, Nelson & Steele, 2000; van Koningsbruggen, Das & Roskos-Ewoldsen, in press) and smokers responding to information about established (Armitage, Harris, Napper & Hepton, 2008) or fictitious health risks of smoking (Crocker et al., 2008). However, some studies have not found effects on such measures (Dillard, et al. 2005; Harris & Napper, 2005).

Studies have also shown that self-affirming reduces message derogation: after self-affirming, sunbathing women rated a leaflet about skin cancer and sun safety as less overblown, exaggerated, manipulative, and straining the truth (Jessop, Simmonds & Sparks, 2009) and at-risk participants rated a message about type 2 diabetes as being less distorted, exaggerated, and too extreme (van Koningsbruggen & Das, in press).

However, agreeing a hazard exists is one thing; accepting it is personally relevant is another. Indeed, accepting that health-risk information is personally relevant is seen as an important step towards changing behaviour (Weinstein, 1988). There is evidence that self-affirmed people are more prepared to take this step: after self-affirming, females rated their sexual experience as significantly more similar to those in an AIDS video than did non-affirmed females or either group of men (Sherman et al., 2000), heavier drinkers reported more easily imagining themselves experiencing breast cancer from alcohol (Harris & Napper, 2005), and smokers reported graphic on-pack smoking warnings to be more personally relevant (Harris, Mayle, Mabbott & Napper, 2007) than did than did their non-affirmed counterparts. In Napper, Harris and Epton (2009) self-affirmed heavier drinking female students rated a message about breast cancer and alcohol as being just as relevant to them as to the average student, whereas their non-affirmed counterparts rated it as marginally more relevant to the average student.

Self-affirming has also resulted in increased self-risk perceptions: after relevant messages Sherman et al. (2000) found higher self-risk judgments for HIV and Harris and Napper (2005) for breast cancer from alcohol in self-affirmed than non-affirmed participants. In contrast, Harris et al. (2007) found no effect of self-affirmation on self-risk judgments for smoking-related diseases among smokers shown the on-pack warnings. (However, non-affirmed smokers showed evidence of defensiveness on most other measures in this study, suggesting that the risk judgments may not have been sensitive.) Self-affirming has also been shown to reduce the extent to which participants view their chances of experiencing future negative health consequences as being lower than comparable others (Klein, Blier & Janze, 2001; Napper et al., 2009; Sherman, Cohen, et al., in press; see Harris & Napper, 2005, for an exception).

Affect

A key motive in rejecting health-risk information is to control the negative affect, such as fear and anxiety, it engenders. Prioritising such "fear control" may undermine "danger control" or the taking of action to reduce the risk (Leventhal, 1970; Witte, 1992). Self-affirmed participants have reported more negative affect after health information (Harris & Napper, 2005; Harris et al., 2007; Jessop et al., 2009) suggesting less fear control. Whether self-affirmation increases the experience of negative affect or enhances the accuracy with which people report their affective experience (or both) is, however, unclear.

Given the nature of Self-Affirmation Theory, surprisingly few published studies have included measures of self-threat (such as items denoting negative self-feelings, Dijkstra, De Vries, Kok & Roijackers, 1999) or self-directed positive affect (Tesser, 2000). In Sherman et al. (2000) self-affirming prior to threat boosted ratings on a self-feeling item (study 1); Jessop et al. (2009) found less positive ratings on the same

item among self-affirmed sunbathers after the leaflet, supporting the hypothesis that

positive self-feeling is a resource expended when facing threat (Reed & Aspinwall,

1998; Raghunathan & Trope, 2002). Recently, Crocker et al. (2008) showed that

feelings of love and connectedness, rather than measures of positive or negative self-

directed feelings, mediated the effects of a values manipulation on smoker's

acceptance of fictitious information about a health risk of smoking. Clearly Crocker et

al.'s findings are potentially very significant, with implications for Self-Affirmation

Theory as a whole, but require replication, not least because the researchers used a

general rather than personal measure of message acceptance, a small sample ($N = 27$)

of relatively light smokers and single item measures of emotion that may be

unreliable.

Message processing

At present, very little published material offers insights into how self-affirming

affects the processing of health-risk information, despite the key hypothesis that it

promotes greater open-mindedness; researchers have focussed more on demonstrating

its effects on outcome measures like acceptance. Nevertheless, the methods used in

some studies offer possible insights into how self-affirming changes the person's

approach to and processing of the threatening elements of the material. However,

most findings await replication.

Reed and Aspinwall separated their message – about the risks of fibrocystic

disease (FBD) from caffeine – into risk-confirming, risk-disconfirming and neutral

passages. Self-affirmed participants rated the risk-confirming passage as significantly

more convincing than the risk disconfirming passage; non-affirmed participants rated

both as equally (and relatively) convincing. Although this may signal less

defensiveness after self-affirming, the passages had been piloted to be of equal

strength, so the self-affirmed group may have been unduly critical of the risk disconfirming passage rather than unbiased.

In open-ended responses coded in Dillard et al. (2005), non-smokers saw on-pack, anti-smoking warnings as being more likely to be effective than did non-affirmed smokers, but not than did self-affirmed smokers, suggesting less defensiveness among self-affirmed smokers. In Napper et al. (2009, study 3) self-affirmed (but not non affirmed) participants made significantly more statements coded as accepting than denying personal relevance when reading the alcohol and breast cancer message, again suggesting less defensiveness among self-affirmed participants.

In van Koningsbruggen et al. (in press) self-affirmed coffee drinkers were quicker than non-affirmed coffee drinkers to respond to threat-related words taken from a message they had read about the effects of caffeine on health, suggesting self-affirming increased the accessibility of threat-related cognitions. Similarly, in Klein and Harris (in press) moderately heavy female drinkers who were self-affirmed showed an attentional bias towards threatening words taken from an article linking alcohol to breast cancer. In contrast, their non-affirmed counterparts showed a bias away from these words (suggesting avoidance). Importantly, no attentional biases appeared for threat words not in the message, suggesting the effect was threat-specific.

The above findings indicate greater readiness to embrace risk confirming or threatening material among self-affirmed participants and suggest that this material may be more cognitively accessible to them. There is some evidence that self-affirming does not, however, alter the time people spend reading or overall tone of their thinking. In Reed and Aspinwall (1998) self-affirmed, higher caffeine-consuming women spent the least time overall reading and their non-affirmed

counterparts the most (but only in statistically liberal one-tailed tests of planned comparisons); moreover, other studies have found no differences between affirmed and non-affirmed participants in reading times (Dillard et al., 2005; Epton & Harris, 2008). In both Sherman et al. (2000) and Napper et al. (2009) self-affirming did not affect the overall valence of the thoughts participants listed after reading information.

Self-affirming may increase readiness to confront threat and influence what is recalled: Self-affirmed, higher caffeine consuming women in Reed and Aspinwall (1998) navigated their way to the more threatening (risk confirming) material more than twice as quickly as their non-affirmed counterparts; however, it is not clear whether this was because they felt readier to confront the threat or because they spent less time reading previous passages (see above). In planned comparisons, non-affirmed, higher consuming women in Reed and Aspinwall (1998) recalled more risk-disconfirming information after one week than their self-affirmed counterparts (and all other groups combined), perhaps suggesting self-affirming reduced a tendency to recall congenial information. No such differences emerged in analyses of the risk confirming information, despite the longer time the non-affirmed, higher consuming women spent reading it. However, Dillard et al. (2005) found no differences in recall of the warnings between smokers in their affirmed and non-affirmed conditions.

Clearly, these data are limited and hard to interpret. Much more data are needed about how self-affirming affects the processing of health-risk information by at-risk participants.

Where next?

Evidence supports the hypothesis that self-affirmed participants are readier to accept uncongenial health-risk information. The evidence ranges across indices of both general and personal message acceptance, affect and message processing.

Nevertheless, there is considerable scope for more research on how self-affirming affects the processing of health-risk information. In particular, currently little is known about *how* self-affirming promotes open-mindedness. Indeed, this appears to be a limitation of the area as a whole. Investigators have offered a range of plausible mediators including mood, state self-esteem, confidence, and self-certainty, but no consistent mediators have emerged across studies (Sherman & Cohen, 2006). Health-related studies have tested whether self-affirming boosts ratings of general mood (e.g., Harris & Napper, 2005; Sherman et al., 2000) and found that it does not, which is consistent with studies of self-affirming more generally (Sherman & Cohen, 2006; however, see Tesser, 2000). The findings of Crocker et al. (2008) regarding the mediating role of other-related affect, notably feelings of loving and connectedness, extend the list of potential mediators and pose an interesting challenge to Self-Affirmation Theory. Crocker et al. claim that value affirmation works precisely because it reminds people about what they care about beyond themselves and it is this that enables them to "transcend the self, reducing defensiveness" (p. 6). (See also Chen & Boucher, 2008, for a discussion of the role of significant others as self-affirmational resources.) The notion that self-affirming boosts confidence and self-certainty is intuitively appealing, has some empirical basis and has been used to explain both beneficial and detrimental effects of self-affirming (Brinol, Petty, Gallardo, & DeMarree, 2007; Klein, Blier & Janze, 2001; Sherman & Cohen, 2006), so also appears to show some promise, but is currently under-researched. Understanding how self-affirming promotes open-mindedness remains a key challenge for self-affirmation researchers. The literature would also benefit from examining when and how self-affirming affects mode of information processing (e.g., Chaiken, Gina-Sorolla, & Chen, 1996).

Part two: Interest in health behaviour change

Resistance to unwelcome information is an important obstacle to changing behaviour; when this resistance is reduced by self-affirming, are at-risk participants more inclined towards changing their behaviour?

Most models of behaviour change identify a summary index of readiness to perform the behaviour – typically intentions – as pivotal to the process (Conner & Norman, 2005). From this perspective, establishing that self-affirmed, at-risk participants show positive changes in intentions post-message is key to assessing its potential role in health behaviour change. Naturally, therefore, researchers have looked for changes both in intentions and the predictors of intentions as identified in these models (Table 1). Intriguingly, while there is good evidence for positive changes in intentions, evidence for changes on predictors is more mixed, perhaps because to date relatively few studies have examined each predictor.

Predictors of intentions

In Jessop et al. (2009) self-affirmed sunbathers had more positive attitudes towards sunscreen use than did non-affirmed sunbathers; However, Harris and Napper (2005) found no effect of self-affirming on attitude towards cutting down on alcohol.

Self-affirmed, higher caffeine consumers in Reed and Aspinwall (1998) had the same level of perceived control over reducing caffeine consumption as lower users; non-affirmed participants' control ratings were lower, suggesting that self-affirming buffered or raised control perceptions. In Harris et al. (2007) perceived behavioural control (PBC) over cutting down on cigarettes was higher among self-affirmed smokers; however, in Harris and Napper (2005) self-affirming did not affect PBC over cutting down on alcohol. Ratings of self-efficacy (perceived ability to enact the recommended behaviour) were higher among self-affirmed participants in the three

published studies that have measured it (Epton & Harris, 2008; Harris et al., 2007; Jessop et al., 2009).

The belief that adopting the recommended behaviour will reduce risk has been used to measure message acceptance (see part one). As "response-efficacy", this belief is also used to predict intentions. Epton and Harris (2008) specifically attempted to promote response efficacy in their message and found it was higher subsequently in the self-affirmed group. In Jessop et al. (2009) self-affirming boosted response efficacy among sunbathers not using sunscreen, suggesting that it enhanced the persuasive effect of their message for this group. In Fry and Prentice-Dunn (2005) women were exposed to a vivid message about breast cancer and then either received or did not receive information about the effectiveness of breast self-examination. Self-affirmation moderated the impact of effectiveness information on response-efficacy. However, it is not clear whether self-affirmation enhanced its impact or not (as the means are unavailable).

Other studies have shown no effects of self-affirming on other predictors of intentions. Dillard et al. (2005) found no effects of self-affirming on ratings of the seriousness of the risks of smoking after the on-pack warnings. (However, mean seriousness was high, suggesting possible ceiling effects.) Napper et al. (2009) found no effects of condition on thoughts coded as taking the message seriously or minimising the issue among female drinkers reading their alcohol leaflet. Harris and Napper (2005) found no effect of self-affirmation on subjective norm (the perception of what important others, such as family or friends, would like you to do).

Intentions

What about intentions themselves? Reed and Aspinwall (1998) were the first to report whether self-affirming promoted healthier intentions and the results were surprising:

despite appearing to accept the message more, higher consuming, self-affirmed participants reported lower intentions to cut down on caffeine than their non-affirmed counterparts. This finding remains a puzzle, not least because subsequent studies have typically found that self-affirming does promote healthier intentions among those at risk (Armitage et al., 2008; Harris et al., 2007; Harris & Napper, 2005; Sherman et al., 2000, study 1; van Koningsbruggen & Das, in press; van Koningsbruggen, et al., in press; though see Fry & Prentice-Dunn, 2005 for an exception). In other studies this difference has approached significance (Epton & Harris, 2008) or was higher in planned contrasts between self-affirmed groups and the non-affirmed one (Jessop et al., 2009). In two smoking studies, however, non-affirmed and affirmed smokers did not differ on some related measures, such as plans or motivation to quit (Dillard et al., 2005; Harris et al., 2007).

In Protection Motivation Theory (PMT, Rogers & Prentice-Dunn, 1997) intention is a measure of adaptive coping to be considered alongside measures of maladaptive coping, like avoidance or feelings of hopelessness. Fry and Prentice-Dunn (2005) found that self-affirmed women with no experience of breast cancer (such as a friend or relative with the disease) reported trying to avoid thinking about the threat less and had lower ratings of hopelessness after the breast cancer message. In Napper et al. (2009) self-affirmed women reported thinking deeply about the alcohol and breast cancer message more than trying not to think about it, whereas non-affirmed participants did not. However, Jessop et al. (2009) found no effects of self-affirming on an item measuring wanting not to think about skin cancer.

Immediate and subsequent health-related behaviour

It is a commonplace that good intentions are not inevitably translated into relevant behaviour. So, what evidence is there for positive effects of self-affirming on actual

health behaviour? Overall, there is good evidence that self-affirming leads to increases in immediate behaviour consistent with expressed intentions, but only one study to date has reported any longer term differences in health behaviour between self-affirmed and non-affirmed participants.

Self-affirmed participants in Sherman et al. (2000, study 2) took more leaflets about HIV and purchased more condoms than did non-affirmed participants. In Armitage et al. (2008) more self-affirmed than non-affirmed smokers in a factory took leaflets giving advice on how to quit. Jessop et al. (2009) offered sunbathers a free sample of sunscreen. Acceptance varied by condition: 40.5% (control), 35% (kindness affirmation), 54.8% (values affirmation) and 63.2% (positive traits) with the difference between the positive traits and control conditions achieving statistical significance. In van Koningsbruggen and Das (in press) self-affirming increased the number of at-risk participants who clicked on an ostensible link to an online test for type 2 diabetes and decreased the number of those not at risk who did so, suggesting greater readiness to take the test in the at-risk group.

In contrast, there is much less evidence of longer-term health behaviour change following persuasion induced by self-affirmation, even though self-affirming has been shown to promote behaviour in non-health domains: for example, Cohen, Garcia, Apfel, and Master (2006) found increases in the grades of minority school students in the semester after a self-affirmation manipulation. Yet in the health domain Reed and Aspinwall (1998) found no differences in participants' reported caffeine consumption 1 week post-manipulation, Harris and Napper (2005) no differences in participants' self-reported alcohol consumption 1 week or 1 month post-manipulation, and Harris et al. (2007) no differences in cigarette consumption 1 week post-manipulation. Recently, however, Epton and Harris (2008) found that self-affirmed participants

reported eating significantly more portions of fruit and vegetables for seven days following the manipulation than did non-affirmed participants. Interestingly, they achieved this by focussing on a health promoting behaviour (diet) rather than the health damaging behaviours targeted previously and by emphasising response- and self-efficacy alongside threat in their message. It may be that these changes removed some obstacles to translating intentions into behaviour (Epton & Harris, 2008).

Clearly, much more research is needed on the longer term consequences of self-affirming for health behaviour and, in particular, on the reasons why the apparent readiness for health behaviour change expressed in intentions has not typically manifested itself in subsequent change. However, this is certainly not a problem unique to this literature: There are many reasons why people with good intentions fail to translate these into behaviour (Sheeran, 2002) and there are currently no theoretical reasons for expecting the intentions formed after self-affirming to be more successful at overcoming this intention-behaviour gap. Indeed, some researchers (e.g., Schwarzer, 1992) differentiate *motivational* or *goal-setting* processes, such as intention formation, from the *volitional* or *goal-striving* processes by which people strive to translate intentions into behaviour, arguing that the processes involved are different. It may be best to consider self-affirmation to be a motivational manipulation – in that it encourages motivation to change in response to a strong message – until such time as theoretical developments or empirical evidence suggest otherwise. We consider this issue further in the companion paper.

In this light, evidence that motivation after self-affirming is sustained is encouraging. For example, in Harris and Napper (2005) vulnerability perceptions about breast cancer from alcohol remained higher one month later. In Harris et al. (2007) motivation to reduce consumption was higher in self-affirmed smokers one

week later (following declines in non-affirmed smokers' motivation). Likewise, the behaviour change in Epton and Harris (2008) was relatively sustained: self-affirmed participants reported eating more fruit and vegetables than non-affirmed participants everyday including the seventh day after the manipulation. This may be all we should reasonably expect of a self-affirmation manipulation that has not been bolstered in some way (e.g., with procedures known to reduce the intention-behaviour gap, such as plans for implementing intentions, Sheeran, Milne, Webb & Gollwitzer, 2005).

Moderation of effects by risk level

What evidence is there that the beneficial effects of self-affirming are more pronounced among those at greater risk? Such evidence is particularly significant, as such respondents are the most in need of change and yet often the hardest to persuade.

In Harris and Napper (2005) the impact of self-affirmation on risk, imagination, negative affect, and intentions was most pronounced among heavier drinkers. In both Harris et al. (2007) and Armitage et al. (2008) the impact of self-affirmation on measures of message acceptance and intentions was greater among higher and moderate than lighter smokers. In van Koningsbruggen and Das (in press) self-affirmation reduced message derogation and raised intentions and likelihood of clicking the link to the diabetes test among those at higher risk, and lowered intentions and likelihood of clicking the link among those at lower risk. This is noteworthy as participants may have a less clear sense of their personal risk in this situation than when thinking about their relative levels of alcohol or cigarette consumption. However, in Epton and Harris (2008) baseline consumption did not moderate the effects of condition and the interaction effect on intentions was not significant ($p = .10$). Moreover, in Klein and Harris (in press) the effects of self-affirming on attentional bias were found in moderate but not heavy drinkers. Indeed,

van Koningsbruggen (2009) has recently argued that the benefits of self-affirming are limited to moderate levels of threat and that it promotes less rather than more objectivity when threat is high or low. This claim has significant theoretical and applied implications but awaits detailed empirical examination.

Overall, therefore, there is some encouraging evidence of moderation by risk level, but also some inconsistencies. Moreover, where moderation has occurred it has affected some but not all of the measures and we currently have no theoretical insights as to why.

Direct effects on stress and health

Evidence is accumulating that, as well as indirect effects via healthier behaviour, self-affirming has the potential for more direct effects on health – such as by affecting the physiological response to stress. Self-affirming has been shown to reduce salivary cortisol (Cresswell, et al., 2005) and to buffer epinephrine levels (Sherman, Bunyan, Creswell & Jaremka, in press) during and after stress. It has also been shown to reduce rumination (Koole, et al., 1999; Koole & van Knippenberg, 2007), which may also have implications for the experience of stress (Sherman & Cohen, 2006). Self-affirming has also been implicated in the beneficial effects of expressive writing, with the number of self-affirming statements made in essays by early stage breast cancer survivors mediating the reductions in physical symptoms they reported three months later (Cresswell, et al., 2006). Crocker et al. (2008) speculate that self-affirming may increase levels of oxytocin, a hormone that increases feelings of love and trust.

Summary

We started with two empirical questions: (1) does self-affirming increase acceptance of relevant health-risk information? (2) do self-affirmed participants subsequently show greater interest in, motivation for and likelihood of subsequent behaviour

change? The answer is a clear yes to question 1 but only a qualified yes to question 2, as evidence for actual behaviour change is currently limited.

Overall, there is promising evidence that being required to self-affirm before receiving heath risk information can promote greater message acceptance and reduce active message derogation in those at risk. In the process, it can promote reports of more negative affect in response to the message. Few studies have examined whether self-affirming changes how people engage with the health-risk information, although it has been shown to affect the balance between thoughts accepting and denying personal relevance, to reduce the time taken to confront threatening information and to decrease recall of risk-disconfirming information. However, no published research has yet shown enhanced recall as a function of self-affirming and no clear pattern has emerged to date concerning its effects on time spent reading the information (although it has not been shown in published research so far to increase it). The positive effects of self-affirming extend to intentions and to behaviour in situ consistent with intentions. There is, however, currently only one published study showing actual health behaviour change following self-affirmation. Nevertheless, there is encouraging evidence that the positive effects of self-affirming may endure and can be most pronounced for those at greatest risk. The latter effect is potentially highly significant, not least because of the applied benefit in reaching such hard to persuade groups. As well as indirect effects on health via healthier behaviour, there is growing evidence that self-affirming may also have beneficial effects on health more directly by, for example, affecting the physiological response to stress.

However, to date there are relatively few studies, so that even the most replicated effects of self-affirming on the response to heath risk information, such as on intentions, are based on only a handful of studies. There is a clear need for studies

simply to add to the existing evidence base. Studies employing process and implicit measures of cognition and affect in particular are so few as to significantly limit our current understanding of what happens when people self-affirm.

Part three: Issues and limitations

What happens to people when they self-affirm and why does this make them more open-minded? Does self-affirming result in genuine readiness to change and if so how? Relatively little progress has been made towards answering the two main process questions at the heart of this literature. With regard to the first – how self-affirming promotes greater open-mindedness – while there are currently several promising leads for mediators (such as confidence and other-directed feelings), we currently know more about what does not appear to mediate the effects (e.g., explicit positive mood, boosts to state self-esteem, agreeableness) than what does. With regard to the second – how self-affirming influences the development of motivation for change – the question has hardly been asked. Does self-affirming simply influence acceptance, so that any effects on motivation for behaviour change stem from the changes – on key predictors of intentions – that naturally follow accepting a health message is important and personally relevant? Or are other processes introduced by the manipulations, such as direct effects of self-affirming on these predictors or even on intentions themselves? This is currently far from clear. We consider these questions in more detail in the companion paper.

Why is there limited evidence of actual health behaviour change in self-affirmation studies? Perhaps self-affirming induces motivation for change that is premature or unstable, because it is not fully thought through or the product of overly optimistic thinking. If so, then the intentions formed after self-affirming would lack the properties, such as temporal stability, known to be associated with successful

behaviour change (e.g., Cooke & Sheeran, 2004) and it would be no surprise that few studies have successfully demonstrated changes in behaviour.

The existence of some evidence of longer-term behaviour change and of sustained motivation for change argues against this, of course, but the next wave of research needs to focus on this question and to assess the properties of the motivation formed after self-affirming. On the other hand, as Epton and Harris (2008) argued, the relative absence of behavioural effects may stem from the difficulty of changing the behaviours (e.g., alcohol consumption, cigarette smoking) targeted in most studies or a failure to provide clear behavioural targets, plans for implementing intentions, and other forms of behavioural support alongside the threat message. More studies should focus on the relative merits of balancing threat and efficacy components of the health-risk information, of targeting health damaging or health promoting behaviours, and providing specific behavioural targets accompanied by techniques known to aid the translation of intentions into behaviour, such as implementation intentions (if-then plans specifying the situational context for enacting behaviour, Sheeran et al., 2005). Research that uses theoretical models to guide both the development of the message and the support offered to foster behaviour change would be particularly useful. In the process, the evidence base would benefit from extending the health-risk information from its current emphasis on one-sided, verbal, non-tailored persuasive messages to other forms of material, such as tailored information, personalised risk feedback and the results of health tests.

Such research would assist both theory development and provide information about the potential for using self-affirming in interventions. Indeed, there are a number of limitations to the existing literature that need addressing before we can adequately assess the latter. Most published studies have involved groups of young

women, typically students, in Western countries (mainly the US, UK and Netherlands). There is some evidence that gender may moderate the effects of self-affirming (Napper et al., 2009; Sherman et al., 2000) and more attention needs to be paid to gender differences. Although non-student samples have been used (e.g., Armitage, et al., 2008; Jessop, et al., 2009), if it is to have a role to play as an intervention, extending this line of research with non-student samples is a priority, as is developing more user-friendly and briefer methods of self-affirming. To this latter end there have been some promising manipulations in recent studies (Charlson et al., 2007; Harris, et al., 2007; Jessop et al., 2009; Napper et al., 2009; Sherman, Cohen et al., in press).

The persuasive messages have also typically targeted health threats that, on the whole, are both temporally and statistically remote for the samples of young people involved. This may render even the most serious of the communicated health-risks moderately rather than highly threatening. Future research needs to use more imminent hazards for the populations tested. Researchers should also attempt to measure the level of threat in studies, especially given suggestions that self-affirming backfires at high and low threat levels (van Koningsbruggen, 2009). Indeed, there may be potential risks in self-affirming that require close attention before it is used in any applied context. While boosts to judgmental confidence, self-certainty, self-efficacy and related beliefs no doubt bring benefits in certain contexts and to certain people, such boosts may also pose hazards. For example, among those not at-risk for the targeted outcome, it may promote unwarranted judgmental confidence (e.g., Brinol et al., 2007). There is even evidence that those who are at-risk may show potentially detrimental reductions in risk perceptions for non-targeted risks (Harris & Napper, 2005).

Finally, the experimental paradigm used in the studies naturally encourages researchers to test for main effects of self-affirmation manipulations and their interactions. Yet, self-affirming may instead alter the relationships between variables (McQueen & Klein, 2006). Indeed, Klein and colleagues (e.g., Klein et al., 2001; Klein & Monin, 2009) have argued that self-affirming changes the basis on which people make judgments when threatened, rendering them more deductive (i.e., less data-driven) and potentially more rather than less defensive. There is evidence to support this (Klein et al., 2001). Clearly, this is another important but currently under-researched aspect of the effects of self-affirming. We consider these issues further in the companion paper.

Conclusions and future directions

Overall, we believe the picture emerging from this nascent literature is encouraging: Self-affirming is clearly able to reduce the biased responses people display to uncongenial but important health-risk information. If the information merits it, at-risk, self-affirmed individuals are more likely to accept it and indicate an interest in changing their behaviour. Thus, self-affirming appears to encourage adaptive responding, reducing responses that minimise the negative emotional impact of the information (fear control) and promoting responses that may eventually reduce the danger (danger control).

These findings both support and extend findings about the effects of self-affirming more generally. They support Sherman and Cohen's (2006) claim that self-affirming opens people to ideas that would "otherwise be too painful to accept" (p. 205). Theoretically, it is proposed that it achieves these effects by providing resources or securing people's self-perceptions, so that they are less concerned with the self-evaluative implications of the information and therefore freer to engage with it less

defensively (Schmeichel & Vohs, 2009; Sherman & Cohen, 2006) – perhaps because it engenders other-directed positive emotions (Crocker et al., 2008).

Self-affirmation has the potential both to add to our understanding of the processes involved when people resist important but unwelcome information and to provide a means by which such resistance might be reduced. As well as having important theoretical implications, therefore, it offers researchers and practitioners the prospect of reducing the impact of defensive processing on health-related decision-making and, in the process, overcoming a significant obstacle to health-behaviour change. It even raises the prospect of interventions to promote healthier behaviour that involve self-affirmation.

Of course, there is much left to discover. In particular, the psychological mechanisms by which self-affirmation achieves its effects are not well understood. To this end, more measures of process are clearly needed, whether to understand how self-affirming promotes message acceptance or subsequently influences the process of health-behaviour change. Much also remains to be discovered about the moderators of these processes. We also need to understand the limits to the beneficial effects of self-affirming before employing it as an intervention. We discuss these and other questions arising from this research further in a companion paper (Harris & Epton, 2009).

References

Armitage, C. J., Harris, P. R., Napper, L. & Hepton, G. (2008). Efficacy of a brief intervention to increase acceptance of health risk information among adult smokers with low socioeconomic status. *The Psychology of Addictive Behaviors, 22*, 88-95.

Aronson, J., Cohen, G. L., & Nail, P. R. (1999). Self-affirmation theory: An update and appraisal. In E. Harmon Jones, & J. Mills (Eds.), *Cognitive dissonance theory: Progress on a pivotal theory in social psychology.* Washington, DC: American Psychological Association Books.

Blumberg, S. J. (2000). Guarding against threatening HIV prevention messages: An information-processing model. *Health Education & Behavior*, *27*, 780-795.

Brinol, P., Petty, R. E., Gallardo, I. & DeMarree, K. G. (2007). The effect of self-affirmation in non-threatening persuasion domains: Timing affects the process. *Personality and Social Psychology Bulletin, 33*, 1533-1546.

Cameron, L. D., & Chan, C. K. Y. (2008). Designing health communications: Harnessing the power of affect, imagery, and self-regulation. *Social and Personality Psychology Compass*, *2*, 262–282.

Chaiken, S., Giner-Sorolla, R. & Chen, S. (1996). Beyond accuracy: Defense and impression motives in heuristic and systematic processing. In Gollwitzer, P. M. & Bargh, J. A, (Eds.), *The psychology of action: Linking cognition and motivation to behavior* (pp. 553-578). London: Guilford Press.

Charlson, M. E. & 8 colleagues (2007). Randomized controlled trials of positive affect and self-affirmation to facilitate healthy behaviours in patients with cardiopulmonary diseases: Rationale, trial design, and methods. *Contemporary Clinical Trials, 28,* 748-962.

Chen, S., & Boucher, H. C. (2008). Relational selves as self-affirmational resources. *Journal of Research in Personality, 42,* 716-733.

Cohen, G. L., Garcia, J., Apfel, N. & Master, A. (2006). Reducing the racial achievement gap: A social-psychological intervention. *Science, 313,* 1307-1309.

Conner, M., & Norman, P. (2005). *Predicting Health Behaviour: Research and Practice with Social Cognition Models* (2nd ed.). Maidenhead, Berks: Open University Press.

Cooke, R., & Sheeran, P. (2004). Moderation of cognition-intention and cognition-behaviour relations: A meta-analysis of properties of variables from the theory of planned behaviour. *British Journal of Social Psychology, 43*, 159-186.

Correll, J., Spencer, S. J., & Zanna, M. P. (2004). An affirmed self and an open mind: Self affirmation and sensitivity to argument strength. *Journal of Experimental Social Psychology, 40*, 350-356.

Cresswell, J. D., Welch, W. T., Taylor, S. E., Sherman, D. K., Gruenwald, T. L., & Mann, T. (2005). Affirmation of personal values buffers neuroendocrine and psychological stress responses. *Psychological Science, 16,* 846-851.

Cresswell, J. D., Lam, S., Stanton, A. L., Taylor, S. E., & Bower, J. E. (2006). Does self-affirmation, cognitive processing, or discovery of meaning explain cancer-related health benefits of expressive writing? *Personality and Social Psychology Bulletin, 33,* 238-250.

Crocker, J., Niiya, Y., & Mischkowski, D. (2008). Why does writing about important values reduce defensiveness? Self-affirmation and the role of positive, other-directed feelings. *Psychological science, 19,* 740-747.

Dijkstra, A. (2008). The psychology of tailoring ingredients in computer-tailored persuasion. *Social and Personality Psychology Compass, 2*, 765-784.

Dijkstra, A., De Vries, H., Kok, G. & Roijackers, J. (1999). Self-evaluation and motivation to change: Social cognitive constructs in smoking cessation. *Psychology & Health, 14,* 747–759.

Dillard, A. J., McCaul, K. D., & Magnan, R. E. (2005). Why is such a smart person like you smoking? Using self-affirmation to reduce defensiveness to cigarette warning labels. *Journal of Applied Biobehavioral Research, 10,* 165-182.

Epton, T. & Harris, P. R. (2008). Self-affirmation promotes health behaviour change. *Health Psychology, 74*, 746-752.

Freeman, M. A., Hennessy, E. V., Marzullo, D. M. (2001). Defensive evaluation of antismoking messages among college-age smokers: The role of possible selves. *Health Psychology, 20,* 424–433.

Fry, R. B., & Prentice-Dunn, S. (2005). Effects of coping information and value affirmation on responses to a perceived health threat. *Health Communication*, *17*, 133-147.

Good, A., & Abraham, C. (2007). Measuring defensive responses to threatening messages: A meta analysis of messages. *Health Psychology Review,1*, 208-229.

Harris, P. R., & Epton, T. (2009). The impact of self-affirmation on health cognition and health behaviour: Issues and prospects. *Manuscript under review.*

Harris, P. R., Mayle, K., Mabbott, L. & Napper, L. (2007). Self-affirmation reduces smokers' defensiveness to graphic on-pack cigarette warning labels. *Health Psychology, 26*(4), 434-446.

Harris, P. R., & Napper, L. (2005). Self-affirmation and the biased processing of health-risk information. *Personality and Social Psychology Bulletin*, *31*(9), 1250-1263.

Jacks, J. Z., & Cameron, K. A. (2003). Strategies for resisting persuasion. *Basic and Applied Social psychology, 25,* 145-161.

Jessop, D. C., Simmonds, L. V. & Sparks, P. (2009). Motivational and behavioural consequences of self-affirmation interventions: A study of sunscreen use among women. *Psychology and Health. 24*, 529-544.

Klein, W. M. P., Blier, H. K., & Janze, A. M. (2001). Maintaining positive self-evaluations: Reducing attention to diagnostic but unfavorable social comparison information when general self-regard is salient. *Motivation and Emotion*, *25*(1), 23-40.

Klein, W. M. P. & Harris, P. R. (in press). Self-affirmation enhances attentional bias toward threatening components of a persuasive message. *Psychological Science.*

Klein, W. M. P. & Monin, M. (2009). When focusing on negative and positive attributes of the self elicits more inductive self-judgement. *Personality and Social Psychology Bulletin, 35*, 376-384.

Koole, S. L., Smeets, K., van Knippenberg, A., & Dijksterhuis, A. (1999). The cessation of rumination through self-affirmation. *Journal of Personality and Social Psychology*, *77*(1), 111-125.

Koole, S. L., & van Knippenberg, A. (2007). Controlling your mind without ironic consequences: Self-affirmation eliminates rebound effects after thought suppression. *Journal of Experimental Social Psychology,* 43, 671-677.

Kunda, Z. (1987). Motivated inference: Self-serving generation and evaluation of causal theories. *Journal of Personality and Social Psychology, 53*, 636-647.

Leventhal, H. (1970). Findings and theory in the study of fear communications. *Advances in Experimental Social Psychology, 5,* 119-186.

Liberman, A., & Chaiken, S. (1992). Defensive processing of personally relevant health messages. *Personality and Social Psychology Bulletin, 18*, 669-679.

McQueen, A. & Klein, W. M. P. (2006). Experimental manipulations of self-affirmation: A systematic review. *Self and Identity,* 5(4), 289-354.

Napper. L., Harris, P. R., Epton, T. (2009). Developing and testing a self-affirmation manipulation. *Self and Identity, 8*, 45-62

Raghunathan, R., & Trope, Y. (2002). Walking the tightrope between feeling good and being accurate: mood as a resource in processing persuasive messages. *Journal of Personality and Social Psychology, 83*, 510-525.

Reed, M. B., & Aspinwall, L. G. (1998). Self-affirmation reduces biased processing of health-risk information. *Motivation and Emotion, 22*(2), 99-132.

Rogers, R. W. & Prentice-Dunn S. (1997). Protection motivation theory. In D. S. Gochman, (Ed.), *Handbook of Health and Behavior Research* (vol. 1, pp. 113-132). New York: Plenum.

Ruiter, R.A.C., Abraham, C., & Kok, G. (2001). Scary warnings and rational precautions: A review of the psychology of fear appeals. *Psychology and Health, 16,* 613-630.

Schmeichel, B. J., & Vohs, K. D. (2009). Self-affirmation and self-control: Affirming core values counteracts ego depletion. *Journal of Personality and Social Psychology, 96*, 770-782.

Schwarzer, R. (1992). Self-efficacy in the adoption and maintenance of health behaviors: theoretical approaches and a new model. In R. Schwarzer, (ed.) *Self-efficacy: Thought control of action* (pp. 217-243). London: Hemisphere.

Schwinghammer S.A., Stapel, D.A., Blanton, H. (2006). Different selves have different effects: Self-activation and defensive social comparison. *Personality and Social Psychology Bulletin, 32*, 27-39.

Sheeran, P. (2002). Intention-behaviour relations: A conceptual and empirical review. In M. Hewstone & W. Stroebe (Eds.), European Review of Social Psychology. (Vol. 12, pp. 1-36.): Chichester, UK: John Wiley & Sons.

Sheeran, P., Milne, S., Webb, T. L., & Gollwitzer, P. M. (2005). Implementation intentions. In M. Conner & P. Norman (Eds.), *Predicting Health Behaviour*. (2nd ed.) (pp. 276-323): Buckingham: Open University Press.

Sherman, D. K., Bunyan, D. P., Creswell, J. D., & Jaremka, L. M. (in press). Psychological vulnerability and stress: The effects of self-affirmation on sympathetic nervous system responses to naturalistic stressors. *Health Psychology.*

Sherman, D. K., Cohen, G. L., Nelson, L. D., Nussbaum, A D., Bunyan, D. P., & Garcia, J. (in press). Affirmed yet unaware: Exploring the role of awareness in the process of self-affirmation. *Journal of Personality and Social Psychology.*

Sherman, D. K. & Cohen, G. L. (2006) The psychology of self-defense: Self-affirmation theory. *Advances in Experimental Social Psychology, 38*, 183-242.

Sherman, D. A. K., Nelson, L. D., & Steele, C. M. (2000). Do messages about health risks threaten the self? Increasing the acceptance of threatening health messages via self- affirmation. *Personality and Social Psychology Bulletin*, *26*(9), 1046-1058.

Steele, C. M. (1975). Name calling and compliance. *Journal of Personality and Social Psychology, 31*, 361-369.

Steele, C. M. (1988). The psychology of self-affirmation: Sustaining the integrity of the self. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology, 21*, 261 – 302.

Steele, C. M., Spencer, S. J., & Lynch, M. (1993*). Self-image resilience and dissonance: The role of affirmational resources. *Journal of Personality and Social Psychology, 64*, 885-896.

Tesser, A. (2000). On the confluence of self-esteem maintenance mechanisms. *Personality and Social Psychology Review, 4,* 290-299.

van Koningsbruggen, G. M. (2009). Processing and acceptance of threatening health information. Unpublished PhD thesis, Free University of Amserdam.

van Koningsbruggen, G. M. & Das, E. (in press). Don't derogate this message! Self-affirmation promotes online type 2 diabetes risk test taking. *Psychology and Health.*

van Koningsbruggen, G. M., Das, E. & Roskos-Ewoldsen, D. R. (in press). How self-affirmation reduces defensive processing of threatening health information: Evidence at the implicit level. *Health Psychology.*

Weinstein, N. D. (1988). The precaution adoption process. *Health Psychology, 7,* 355-386.

Witte, K. (1992). Putting the fear back into fear appeals: The extended parallel process model. *Communication Monographs, 59, 329-349.*