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FULL PAPER

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The effects of fear appeals on defensive and accepting reactions of smokers with different levels of self-esteem

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Effekte von Furchtappellen auf Reaktanz und Absicht zum Rauchstopp unter Berücksichtigung des Selbstwertgefühls

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Abstract: In this study, the Extended Parallel Process Model (EPPM) served as a theoretical background for explaining the persuasive effects of fear appeals on smokers. Based on the self-consistency theory, self-esteem was included as a moderator in this model for understanding in more detail under which circumstances, a fear appeal leads to accepting responses or to reactance. An online experiment was conducted, participating smokers read an article that contained either a neutral picture or a fear appeal. Including self-esteem in the EPPM revealed that in contrast to smokers with high self-esteem, smokers with low self-esteem increased perceived susceptibility and intention to quit, as well as reactance to a fear appeal. Moreover, reactance could not be considered a negative reaction to the fear appeal message, because for individuals with low self-esteem it was positively associated with the intention to quit. Results suggest that additionally considering smokers' self-esteem can contribute to a more accurate prediction of the persuasive effects of fear appeals. The impact of self-esteem and reactance in health-related behavior is discussed, as are the implications for health-related messages and future research.

Keywords: Fear appeal; self-esteem; self-efficacy; perceived susceptibility; reactance; cognitive dissonance; intention to quit smoking.

Zusammenfassung: Ziel der Studie war es, basierend auf dem Extended Parallel Process Model (EPPM) und der Theorie der Selbstkonsistenz die persuasiven Effekte von Furchtappellen auf Rauchende zu erklären. Dabei wurde das Selbstwertgefühl der Rauchenden als Moderator miteinbezogen, um genauer zu verstehen, unter welchen Umständen ein Furchtappell zu akzeptierenden oder abwehrenden Reaktionen (i.e., Reaktanz) führt. Es wurde ein Online-Experiment durchgeführt, dabei lasen die teilnehmenden Rauchenden einen Artikel, der entweder ein Furchtbild oder ein neutrales Bild enthielt. Während bei Rauchenden mit hohem Selbstwertgefühl kaum Reaktionen auf einen Furchtappell festgestellt werden konnten, reagierten Rauchende mit tiefem Selbstwertgefühl sowohl mit erhöhter Gefährdungswahrnehmung und Absicht zum Rauchstopp, als auch mit erhöhter Reaktanz. Reaktanz konnte allerdings nicht eindeutig als abwehrende Reaktion betrachtet werden, da sie bei Rauchenden mit tiefem Selbstwertgefühl positiv mit der Absicht zum Rauchstopp zusammenhing. Die Resultate weisen darauf hin, dass sich vor allem Rauchen-

de mit niedrigem Selbstwertgefühl mit der Furchtappellbotschaft auseinandersetzten. Selbstwertgefühl sollte deshalb bei der persuasiven Wirkung von Furchtappellen miteinbezogen werden. Implikationen bezüglich der Rolle von Reaktanz und Selbstwertgefühl in der Präventionskommunikation, und bezüglich zukünftiger Forschung werden diskutiert.

Schlagwörter: Furchtappelle; Selbstwertgefühl; Selbstwirksamkeitserwartung; Gefährdungswahrnehmung; Reaktanz; kognitive Dissonanz; Absicht zum Rauchstopp.

1. Introduction

Tobacco use is the leading cause of preventable death globally (World Health Organization, 2016); consequently, antismoking campaigns in many countries seek to prevent people from smoking. Successful antismoking campaigns contain both fear appeals and self-efficacy-enhancing information (e.g., Huang et al., 2015; Wakefield, Freeman, & Donovan, 2003). This combination is recommended by the Extended Parallel Process Model of Witte (1992). "Fear appeals are persuasive messages designed to scare people by describing the terrible things that will happen to them if they do not do what the message recommends" (Witte, 1992, p. 329). For smokers, fear appeals mainly accentuate the health-related risks of smoking such as lung cancer, losing teeth, and impotence (Tobacco Products Directive, 2014). Self-efficacy-enhancing information enables people to perform the recommended behavior by allowing them to control the danger – not their fear (Bandura, 1977; Witte, 1992). For smokers, providing information such as the phone number of a quitline empowers them to quit smoking (Peters, Ruiter, & Kok, 2013; Tobacco Products Directive, 2014).

Meta analyses have confirmed that fear appeals that include self-efficacy-enhancing information have more favorable effects on intention to quit smoking and quit attempts than fear appeals that do not include self-efficacy-enhancing information (Tannenbaum, et al., 2015; Witte & Allen, 2000). However, fear appeals, although effective, also are prone to elicit defensive reactions (Ruiter, Kessels, Peters, & Kok, 2014), which means that the receiver dismisses or disregards the health information (van 't Riet & Ruiter, 2013). Defensive reactions include, for instance, suppression of the threat, which means that people inhibit threatening thoughts when faced with a fear appeal (van 't Riet & Ruiter, 2013). Another defensive reaction is reactance, which comprises anger and counterarguing against the freedom-threatening fear appeal (Dillard & Shen, 2005). This reaction is particularly undesirable because it may not only inhibit persuasive effects of fear appeals, but elicit boomerang effects, which means that smokers do the contrary of what the message recommends (Quick, Shen, & Dillard, 2013). Thus, although combining fear appeals with self-efficacy-enhancing information often leads to accepting reactions, there is a lack of evidence regarding the circumstances under which fear appeals evoke defensive reactions.

For a better understanding of the effects of fear appeals, one has to consider that a fear appeal which emphasizes the harmful health consequences of smoking might elicit negative cognitions in smokers (e.g., "smoking is damaging my health") that are inconsistent with their attitudes and behavior. Defensive reactions, such as reactance or suppression of the threat, may help to reduce the cog-

nitive dissonance evoked by the fear appeal (Glock & Kneer, 2009). According to the theory of self-consistency (Aronson, 1968), people with high self-esteem are more likely to engage in defensive reactions than people with low self-esteem when they are in dissonance-arousing situations (e.g., Brockner & Elkind, 1984). Therefore, the first aim of the present study was to examine whether considering smokers' self-esteem might improve the prediction of defensive and accepting reactions to fear appeals. Moreover, even though reactance is assumed to be negatively associated with the behavior recommended by the message (e.g., Witte, 1992), there is no clear empirical evidence of a negative effect of reactance on intention to quit smoking (e.g., Cho et al., 2016). The second aim of this study, therefore, was to gain a clearer understanding of the relation between reactance and intention to quit smoking. The overall objective was to gain a deeper insight of the effectiveness of fear appeals, including a clarification of why fear appeals sometimes fail, and thus to derive implications for antismoking campaigns.

In the following chapters, initially, the Extended Parallel Process Model of Witte (1992) is described, with an explanation of the conditions under which fear appeals are likely and unlikely to lead to intention to quit. Then, the role of self-esteem in reactions to fear appeals is discussed. After that, the effects of reactance on intention to quit smoking are presented and finally, a hypothetical model is derived.

2. Theory explaining effects of fear appeals

2.1 Extended Parallel Process Model

The Extended Parallel Process Model (EPPM; Witte, 1992) is based on the Parallel Response Model (Leventhal, 1970) and the Protection Motivation Theory (Rogers, 1975). According to the EPPM, the first appraisal in response to a fear appeal is the appraisal of threat, including the perceived susceptibility to the threat and the perceived severity of the threat. Perceived susceptibility[1] refers to the extent to which individuals perceive themselves as vulnerable to a certain situation (Rosenstock, 1974). "In the context of tobacco consumption, it indicates an individual's perception of suffering from diseases or health-related problems due to continuous tobacco consumption" (Rahman, Mannan, & Rahman, 2018, p. 98). According to the EPPM, fear is elicited if the threat is perceived to be moderate or high. In this case, people are motivated to begin the second appraisal, which is an evaluation of efficacy. The efficacy dimension consists of self-efficacy, which is the perceived ability to perform a behavior (Bandura, 1977), and response efficacy, which is the extent to which people believe a recommended response will effectively counteract a health threat (Witte, 1992). When perceived threat and perceived efficacy are high, danger control processes are initiated. The individual is then likely to initiate the behavior recommended by the message. In

1 Empirical research on smoking cessation uses various synonyms for perceived susceptibility, such as perceived vulnerability (Tyc et al., 2006), health concern (McCaul et al., 2006), and risk perception (Weinstein, Marcus, & Moser, 2005).

contrast, when perceived threat is high but perceived efficacy is low, fear control processes are elicited. People then cope with their fear through defensive reactions, such as reactance. Reactance is a negative reaction to a freedom-threatening situation and serves to restore individual freedom (Brehm & Brehm, 1981). When smokers' reactance toward a fear appeal increases, it means that they are angry about the message and that they argue against it. As a consequence, they may become even more entrenched in their opinion and behavior than before (Dillard & Shen, 2005). Thus, they might have less intention to quit smoking than before seeing the fear appeal. For example, a fear appeal message might indicate that smoking causes lung cancer and include the phone number of a quitline. Smokers seeing this message might feel susceptible to lung cancer and consider the disease to be severe (perceived threat). If they feel that they are able to quit smoking and that quitting would reduce the probability of lung cancer (perceived efficacy), they will increase their intention to quit smoking. However, if they do not feel able to quit or do not think that quitting would be helpful, they are likely to enter a fear control process in which they try to reduce their fear rather than stopping smoking (i.e., reduce the danger). In this case, they might react defensively, such as by formulating a counterargument to the message (e.g., "It is not true that smokers are at high risk of lung cancer").

To summarize, against the background of smoking cessation, the EPPM explains under which circumstances an increase in perceived threat leads to intention to quit and under which circumstances it leads to reactance. However, the EPPM does not clearly state the circumstances under which fear appeals increase the perception of threat. Although Tannenbaum et al. (2015) suggest that medium and high fear appeals are successful in increasing the perceived threat, according to Maloney, Lapinski, and Witte (2011) there is no guarantee that fear appeals will be effective in doing so. For understanding in more detail under which circumstances fear appeals increase perceived threat, the next section discusses a personality trait that may influence people's accepting and defensive reactions to fear appeals.

2.2 Self-esteem determines defensive reactions to dissonance-arousing stimuli and its effects on intention to quit

Fear appeals accentuate the harmful consequences of smoking, indicating that the smoker acts in a way that violates his or her health (Witte, 1992). Thus, smokers seeing a fear appeal might hold two cognitions that are inconsistent with each other; for instance, "I like smoking" and "smoking is damaging my health" (Glock & Kneer, 2009). A fear appeal is thus likely to be a dissonance-arousing stimulus. As individuals strive for consistency, holding cognitions that are inconsistent with each other produces a state of cognitive dissonance that is uncomfortable and must be resolved by reducing this inconsistency (Festinger, 1957; Harmon-Jones & Harmon-Jones, 2007).

Self-esteem seems to play an important role when people deal with dissonance-arousing messages (Aronson, 1968). Self-esteem refers to an individual's evaluati-

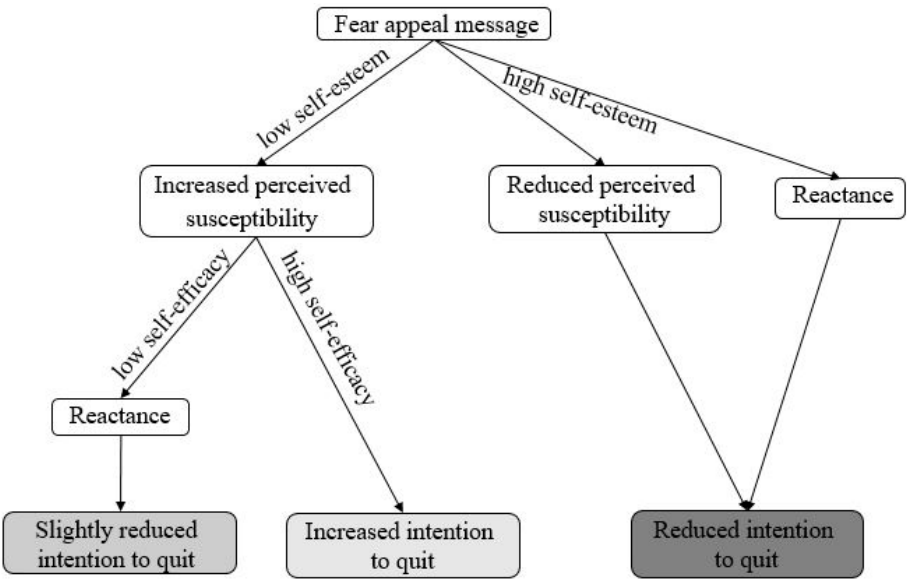
on of their personal worth and is a central component of the self (Leary & MacDonald, 2003). Accordingly, people with high self-esteem claim to be more likable and attractive, and to make better impressions on others than do individuals with low self-esteem (Baumeister, Campbell, Krüger, & Vohs, 2003). In addition, individuals with high self-esteem think positively of themselves (Peterson, Haynes, & Olson, 2008). According to Aronson's self-consistency theory, people with high self-esteem have a better self-concept than those with low self-esteem. Therefore, they view a dissonant act as discrepant with their positive self-concept, thus, these individuals are prone to engaging in dissonance-reduction strategies to restore their positive self-image (Aronson, 1968; Van Dellen, Campbell, Hoyle, & Bradfield, 2011). However, people with low self-esteem think poorly of themselves (Peterson et al., 2008). Consequently, they perceive less discrepancy between their negative or undesirable behavior and their expectations of themselves. Thus, they might find it easier to accept a counterattitudinal message about their behavior. People with low self-esteem are therefore less likely to engage in dissonance-reducing strategies (Aronson, 1968).

One possibility for dealing with dissonance-arousing situations is reactance (e.g., Glock & Kneer, 2009). As people with high self-esteem engage more in dissonance-reducing strategies (Aronson, 1968), higher reactance reactions are expected for these individuals. Indeed, empirical studies have found a positive relation between self-esteem and reactance (e.g., Brockner & Elkind, 1984; Hellman & McMillin, 1997; Joubert, 1990). Thus, reactance against the dissonance-arousing stimulus seems to be a strategy to reduce cognitive dissonance in individuals with high self-esteem. However, there is empirical evidence that reactance might not be the only defensive reaction used to reduce cognitive dissonance. For instance, Glock and Kneer (2009) reported significant declines in smokers' perceived susceptibility after seeing a fear appeal. Their interpretation of this finding was that smokers reduced the cognitive dissonance evoked by the fear appeal by decreasing their perceived susceptibility. Gibbons, Eggleston, and Benthin (1997) confirmed that perceived susceptibility and commitment to quit smoking decreased among smokers with high self-esteem when they were in a dissonance-arousing situation. Thus, both reactance and reduced perceived susceptibility seem to be defensive reactions that help to reduce cognitive dissonance. The latter is likely to involve suppression of thoughts about the threat, which is one of the defensive reactions described by van 't Riet and Ruiter (2013).

To summarize, the higher smokers' self-esteem, the more they are expected to reduce cognitive dissonance when they see a fear appeal. There is empirical evidence that their dissonance-reducing strategies include at least two defensive reactions: increased reactance and reduced perceived susceptibility (Brockner & Elkind, 1984; Glock & Kneer, 2009). Both defensive reactions seem to occur independently of each other. As smokers with high self-esteem try to protect their self-concept (Aronson, 1986), these strategies seem to serve as justifications for not quitting smoking. Thus, reduced perceived susceptibility and reactance may counteract the intention to quit. In contrast, the lower smokers' self-esteem, the more they are expected to accept the fear appeal, which will lead to increased perceived susceptibility. According to the EPPM, when perceived susceptibility is

increased – which is one of the components of perceived threat – intention to quit will also increase. However, reactance may still occur if individuals do not perceive themselves as having sufficient efficacy to control the danger (Witte, 1992). In this case, reactance may *depend* on perceived susceptibility, as proposed by the EPPM. When reactance occurs due to a lack of self-efficacy – which is one of the efficacy components – it is likely to reflect concern about the inability to quit (Cho et al., 2016), rather than a justification for continuing to smoke. Therefore, the relationship between reactance and intention to quit might be less negative for smokers with low self-esteem than for smokers with high self-esteem. These processes are schematically visualized in Figure 1.

Figure 1. Schematic visualization of the processes assumed in the hypotheses



2.3 Relation between reactance and intention to quit smoking

Previous studies have aimed to investigate how reactance can be avoided in order to increase persuasiveness of fear appeals. They have found for instance that reactance is less likely when people are faced with a textual fear appeal than with a graphical fear appeal (Erceg-Hurn & Steed, 2011), or with no fear appeal instead of a graphical fear appeal (LaVoie, Quick, Riles, & Lambert, 2017). Moreover, reactance is reduced when the language used is not controlling (Xu, 2015) and when warning labels are formulated as questions (Glock, Müller, & Ritter, 2012). However, these previous studies did not measure intention to quit smoking or smoking cessation. Other studies have found that including humor in fear appeals reduces reactance, however including humor has not been reported to have an

effect on intention and behavior (Blanc & Brigaud, 2013; Nabi, 2016). Thus, the assumed positive effects of reduced reactance on intention to quit smoking have not been confirmed. Rather, in a review study, van 't Riet and Ruiter (2013) reported that defensive reactions may even help to control negative emotions and may therefore facilitate rather than reduce intention to change health-related behavior. Confirming these results, Cho et al. (2016) conducted a panel study in which stronger reactance was positively associated with forgoing cigarettes and with subsequent quit attempts. Overall, increased reactance does not necessarily counteract the intention to quit, whereas reduced reactance does not seem to foster the intention to quit. This is contrary to the assumed negative effects of reactance on intention and behavior (Witte, 1992). As mentioned above, considering self-esteem might shed some light on the relationship between reactance and intention to quit (see also Figure 1).

3. Hypothetical model

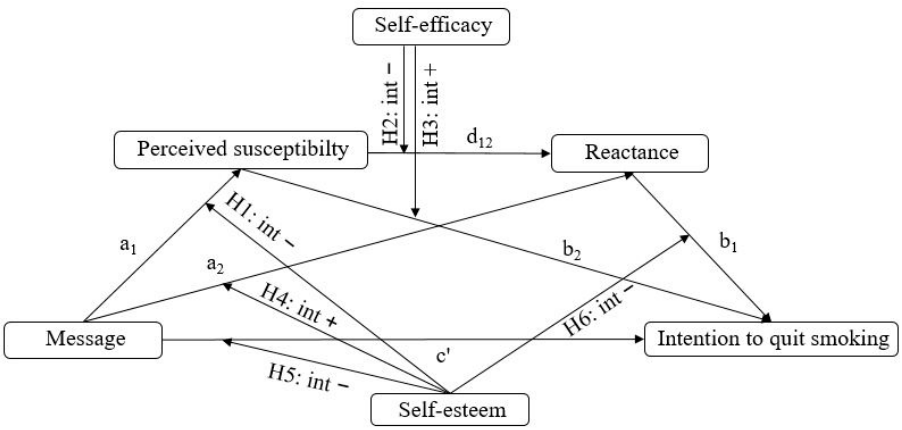
In research on smoking cessation, perceived susceptibility is the factor most frequently included for the threat dimension, and self-efficacy is the factor most frequently included for the efficacy dimension (e.g., Norman, Conner, & Bell, 1999; Rahman et al., 2018). Some researchers have mentioned that it is overwhelmingly evident that smoking is dangerous (van 't Riet & Ruiter, 2013). Moreover, Tannenbaum et al. (2015) stated that perceived susceptibility predicts intention, whereas perceived severity does not. Likewise, response efficacy – the extent to which a recommended response is thought to effectively deter a health threat (Witte, 1992) – might be considered obvious. Correspondingly, Norman et al. (1999) recommend focusing on perceived susceptibility and self-efficacy to predict smokers' motivation to quit. Thus, in the present study perceived susceptibility was included for the threat dimension and self-efficacy for the efficacy dimension.

As reported in chapter 2.1, the EPPM does not clearly state the circumstances under which fear appeals increase perceived susceptibility as a first step of message acceptance. However, self-esteem may play a central role in determining the conditions under which a fear appeal leads to accepting and defensive reactions to a fear appeal message. According to the theory discussed in chapter 2.2, the lower smokers' self-esteem, the more their perceived susceptibility is expected to increase, which is the persuasive intent of the fear appeal message. In contrast, the higher smokers' self-esteem, the more they are expected to reduce their perceived susceptibility as a defensive reaction to the fear appeal message. Thus, the association between the message and perceived susceptibility is assumed to be negatively moderated by self-esteem (H1). Moreover, according to the EPPM, increased perceived susceptibility will lead to increased intention to quit when self-efficacy is high, but to reactance when self-efficacy is low. Therefore, the association between perceived susceptibility and reactance is expected to be negatively moderated by self-efficacy (H2), and the association between perceived susceptibility and intention to quit is assumed to be positively moderated by self-efficacy (H3).

As smokers with lower self-esteem are expected to accept the message, they might not only increase perceived susceptibility, but also intention to quit smo-

king when faced with a fear appeal. However, dissonance-reducing strategies are assumed for smokers with high self-esteem, in order to maintain their positive self-image. One of these dissonance-reducing strategies can be reactance (chapter 2.2). Correspondingly, their intention to quit smoking is likely to decline. Thus, the association between the message and reactance is expected to be positively moderated by self-esteem (H4), and the association between the message and intention to quit smoking is assumed to be negatively moderated by self-esteem (H5). Moreover, according to chapter 2.2., the association between reactance and intention to quit is assumed to be less negative for smokers with low self-esteem than for smokers with high self-esteem. Hence, the association between reactance and intention to quit might be negatively moderated by self-esteem (H6). The model is depicted in Figure 2.

Figure 2. Conceptual moderated mediation model



Note. Positive interactions imply that the effects on the dependent variable are assumed to be stronger when the values of the moderator are higher. Negative interactions imply that the effects on the dependent variable are assumed to be stronger when the values of the moderator are lower; int = interaction.

4. Method

4.1 Participants and design

The present study was conducted as an online experiment. The experimental manipulation consisted of a message (a newspaper article) combined with a picture that was either a fear appeal or a neutral picture. Self-esteem served as the quasi-experimental moderating variable. Self-efficacy was included as a second moderating variable. Reactance, perceived susceptibility, and intention to stop smoking were the dependent variables.

Participants were recruited via email by Respondi in the German-speaking part of Switzerland. Individuals were excluded if they indicated that they did not

smoke regularly, did not complete the entire questionnaire, or spent less than 30 seconds reading the article (at least this much time was needed to skim through the article). After excluding these participants, 323 smokers remained in the sample, 57.9% of whom were women. Participants' ages ranged from 18 to 82 years (M = 45.23, SD = 13.42). In the final sample, 6.0% had completed obligatory schooling as their highest level of education, 53.2% had finished an apprenticeship or earned a college diploma, and 40.8% had completed higher education (university, college of higher education, or polytechnic).

259 (91.3%) participants smoked every day, and the other 8.7% smoked several times a week. Among the daily smokers, 8.5% smoked 1–5 cigarettes/day, 23.0% smoked 6–10 cigarettes/day, 50.5% smoked 11–20 cigarettes/day, and 18.0% smoked 21–45 cigarettes/day. On average, participants smoked 16.42 (SD = 8.16) cigarettes/day. The sample was representative of daily smokers in terms of age, education, and smoking habits (BAG, 2019).

4.2 Procedure

The online survey consisted of a questionnaire written in German. Participants were informed that the goal of the study was to understand the thinking and behavior of smokers. Moreover, they were informed that they would be asked to read an article and then comment on it. At the beginning of the questionnaire, participants reported their sex, age, and education, and responded to questions about their self-esteem. They then reported their smoking habits, such as their daily frequency of smoking. Then, participants were randomly classified into two groups: one group read an article including a picture with a fear cue, which was the fear appeal message, and the other group read an article including a neutral picture, which was the neutral message. Before they began reading, participants were advised to read the article carefully. Afterwards, all participants indicated their level of perceived susceptibility regarding smoking-related health risks, their self-efficacy, their reactance, and their intention to quit smoking, and responded to the manipulation check items. To maintain the cover story, participants were asked to comment on the article if they wished to do so. The participants were then thanked, debriefed, and given the opportunity to provide open comments.

4.3 Stimulus materials

The message consisted of a fictitious newspaper article entitled "Most smokers manage to stop smoking," which was intended to enhance self-efficacy among the participants. The article described the results of a panel study reporting that 71.5% of smokers who decided to stop smoking managed to quit and remain non-smokers, even if they had previously made several unsuccessful attempts to quit. In the article, a fictitious professor of health psychology explained that quit attempts for most smokers meant that they could quit smoking even if they had relapsed before. The professor further explained that a few years after quitting, former smokers' health risks, such as the risk of developing lung cancer, were reduced. He expressed support for tobacco-prevention campaigns and support pro-

grams, such as a quitline and smoking-cessation apps. The article contained either a neutral picture (a hand holding a cigarette) or a fear appeal (a picture of a healthy lung and a black lung with cancer). A total of 162 participants read the article including the fear appeal, with an average reading time of 78 seconds (*SD* = 29 seconds), and 161 read the article including the neutral picture, with an average reading time of 82 seconds (*SD* = 25 seconds). As lung cancer is a well-known health-risk of smoking (Tobacco Products Directive, 2014), it was assumed that smokers would attribute the lung cancer picture to their own health-related risks of smoking. This was confirmed in a pretest[2].

The picture was embedded in the self-efficacy-enhancing article for two reasons. First, the EPPM recommends adding efficacy-enhancing information when the target group is faced with a fear appeal (Witte, 1992). Second, participants were exposed to the picture for at least 30 seconds while reading the article.

4.4 Measures

Self-esteem. Self-esteem (M = 3.98, SD = 0.75, α = .90) was measured using Rosenberg's (1965) self-esteem scale, which consists of 10 items (e.g., "on the whole, I am satisfied with myself" and "I wish I could have more respect for myself" [a reversed-coded item]). The items were rated on a 5-point Likert scale ranging from 1 (*does not apply to me*) to 5 (*fully applies to me*).

Self-efficacy. Self-efficacy (M = 2.71, SD = 0.95, α = .89) was measured using a 10-item self-efficacy/situational temptation scale constructed by Velicer, DiClemente, Rossi, and Prochaska (1990). The scale assesses confidence in not smoking in a variety of situations in which smokers are likely to smoke (e.g., "I'm confident about not smoking when I'm extremely stressed" and "I'm confident about not smoking when I'm with friends at a party"). The items were rated on a 5-point Likert scale ranging from 1 (*not at all*) to 5 (*very much*).

Perceived susceptibility. Based on Weinstein, Marcus, and Moser's (2005) work, four items were constructed to assess perceived susceptibility regarding smoking-related health risks (M = 2.66, SD = 1.18, α = .88). The most damaging and frequent health consequences of smoking were combined into one scale. According to the Centers for Disease Control and Prevention (CDC, 2017), lung cancer and respiratory diseases are among the most damaging health risks of smoking. Likewise, skin aging is regarded as a frequent health consequence of smoking (Morita, 2007). In the present study, the participants were thus asked to respond to the following statements: "I am damaging my health if I continue to

2 In a pretest with undergraduate students, one-way ANOVAs revealed that the fear appeal elicited significantly more fear than the neutral picture, n_{fear} = 32, M_{fear} = 3.06, SD_{fear} = 1.03; $n_{neutral}$ = 29, $M_{neutral}$ = 1.89, $SD_{neutral}$ = 0.96; $F(1, 60) = 45.56$, $p < .001$, $\eta^2 = .25$. The self-efficacy-enhancing effect of the article was also tested in the pretest using three items (e.g., "The message encouraged my confidence to be able to stop smoking," 1 [not at all] to 5 [very much], α = .81). Smokers perceived the article as self-efficacy-enhancing, with values higher than the midpoint of the scale, independent of which picture was included in the article, n_{fear} = 32, M_{fear} = 3.62, SD_{fear} = 1.28, $t(31) = 2.72$, $p < .05$); $n_{neutral}$ = 29, $M_{neutral}$ = 3.64, $SD_{neutral}$= 1.27, $t(28) = 2.73$, $p < .05$. Moreover, the means of the groups did not differ significantly. Thus, the manipulation was successful.

smoke as usual," "My smoking behavior increases my risk of getting lung cancer," "I increase my risk of skin aging if I continue to smoke as usual," and "Smoking reduces my fitness level." The items were rated on a 5-point scale ranging from 1 (*not at all*) to 5 (*very much*).

Intention to stop smoking. Four items (Wong & Capella, 2009; e.g., "How likely is it that you will quit smoking completely and permanently in the next three months?") assessed intention to stop smoking (M = 2.56, SD = 1.05, α = .82). The items were rated on a 5-point scale ranging from 1 (*not likely at all*) to 5 (*very likely*).

Reactance. According to Dillard and Shen (2005), reactance consists of three subcomponents: perceived threat to freedom, counterarguing/negative cognitions, and anger (M = 1.94, SD = 0.67, α = .79). Six items drawn from Dillard and Shen (2005) were used to measure perceived threat to freedom (e.g., "The message threatened my freedom to choose") and anger (e.g., "The message made me feel angry"). Counterarguing was measured using three items devised by Silvia (2006; e.g., "I was criticizing the message while I was reading it"). The items were rated on a 5-point scale ranging from 1 (*not at all*) to 5 (*very much*).

Fear manipulation. Three items based on the work of Renaud and Unz (2006) measured the fear induction of the message (M = 1.94, SD = 1.10, α = .75): "The message was scary for me," "The message frightened me," and "The message reassured me" (a reversed-coded item). These items were rated on a 5-point Likert scale ranging from 1 (*not at all*) to 5 (*very much*).

5. Results

5.1 Manipulation check

The manipulation of fear induction was tested[3]. A one-way ANOVA showed that the message containing the fear appeal (M = 2.45, SD = 1.30) was perceived as significantly more frightening than the message containing the neutral picture (M = 1.86, SD = 0.96), $F(1, 321) = 23.56$, $p < .001$, $\eta^2 = .07$. Thus, the manipulation of the stimulus was successful.

5.2 Preliminary analyses

Table 1 lists the means, standard deviations, and bivariate Pearson correlations of all indices. The two variables conceptualized as moderators in the study, self-efficacy and self-esteem, were not correlated (r = .06, *ns*). Most of the correlations were in the direction assumed in the hypotheses. For instance, perceived susceptibility was positively related to both reactance (r = .31, p < .01) and to intention to quit smoking (r = .53, p < .01). As expected, self-efficacy was positively related to intention to quit smoking (r = .19, p < .01). However, although self-efficacy was expected to counteract reactance, these two variables

3 As the picture – not the self-efficacy-enhancing text – varied in the articles, in the main study the self-efficacy-enhancing effect of the article was not measured.

were not negatively related (r = .10, *ns*). Moreover, self-esteem was negatively related to reactance ($r = -.12$, $p < .05$), which was contrary to the expected direction of the effect. Moreover, there was a significant positive association between reactance and intention to quit smoking ($r = .14$, $p < .05$).

Table 1. Means, standard deviations and correlation indices of all variables

Variable	*M*	*SD*	1	2	3	4	5
1. Manipulation check fear	1.94	1.10					
2. Perceived susceptibility	2.66	1.18	.51**				
3. Self-efficacy	2.71	0.95	.05	.08			
4. Self-esteem	3.98	0.75	–.15**	–.11*	.06		
5. Reactance	1.94	0.67	.35**	.31**	.10	–.12*	
6. Intention to quit	2.56	1.05	.34**	.53**	.19**	–.06	.14*

Note. *M* = mean; *SD* = standard deviation; *N* = 323; * $p < .05$; ** $p < .01$.

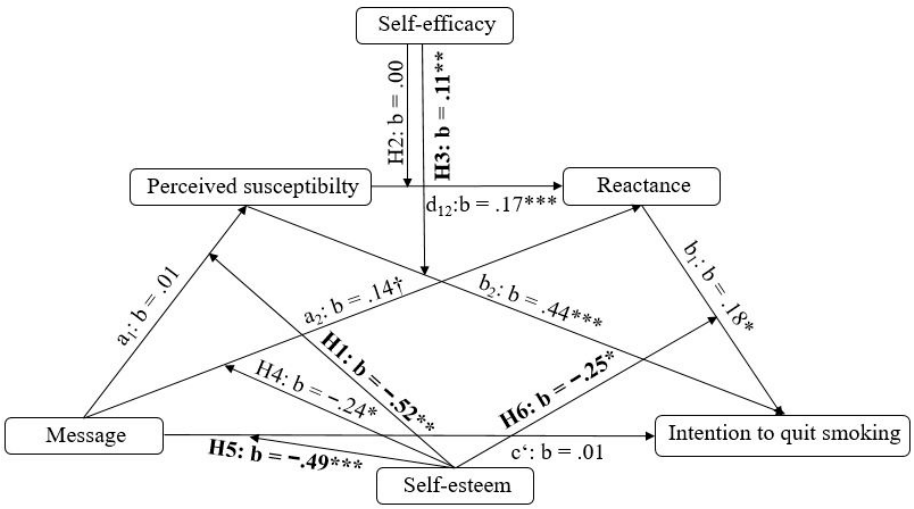
5.3 Testing the hypothetical model

A moderated mediation analysis was conducted by creating a customized model in the SPSS PROCESS Macro. In accordance with Hayes (2017) advice, model 6 was used as the model basis. The message (0 = neutral picture, 1 = fear appeal) was the independent variable, perceived susceptibility and reactance were the mediators, and intention to quit smoking was the dependent variable. Subsequently, self-efficacy was included as a moderator by adding Moderator Matrix W (0, 0, 1, 0, 1, 0). Self-esteem was included as a second moderator by adding Moderator Matrix Z (1, 1, 0, 1, 0, 1). The results are depicted in Figure 3. To visualize the interactions, PROCESS Model 1 was calculated for each significant interaction. Data were generated for plotting, indicating numbers for low, medium, and high values of the corresponding variables (Hayes, 2017). The plots are shown in Figure 4.

The message had no significant effect on perceived susceptibility ($b = .01$, $SE = .13$, $t = .06$, *ns*). However, as expected, the relation between the message and perceived susceptibility was moderated by self-esteem ($b = -.52$, $SE = .16$, $t = -3.15$, $p < .01$). As shown in Figure 4 (interaction 1), when faced with a fear appeal the smokers with low self-esteem reported higher perceived susceptibility, whereas smokers with high self-esteem reported lower perceived susceptibility. Thus, H1, which predicted that the association between the message and perceived susceptibility would be negatively moderated by self-esteem, was supported. Perceived susceptibility was positively associated with reactance ($b = .17$, $SE = .03$, $t = 5.57$, $p < .001$). However, there was no moderating effect of self-efficacy on the relation between

perceived susceptibility and reactance (b = .00, SE = .03, t = .12, *ns*). Thus, H2, which predicted that the association between perceived susceptibility and reactance would be negatively moderated by self-efficacy, was not confirmed. There was a significant association between perceived susceptibility and intention to quit smoking (b = .44, SE = .04, t = 10.97, p < .001). As predicted, the interaction effect of self-efficacy on the association between perceived susceptibility and intention to quit was significant (b = .11, SE = .04, t = 2.79, p < .01). Figure 4 (interaction 3) shows that intention to quit increased more among smokers with higher self-efficacy. Thus, H3, which predicted that the association between perceived susceptibility and intention to quit would be positively moderated by self-efficacy, was supported.

Figure 3. Moderated mediation analysis

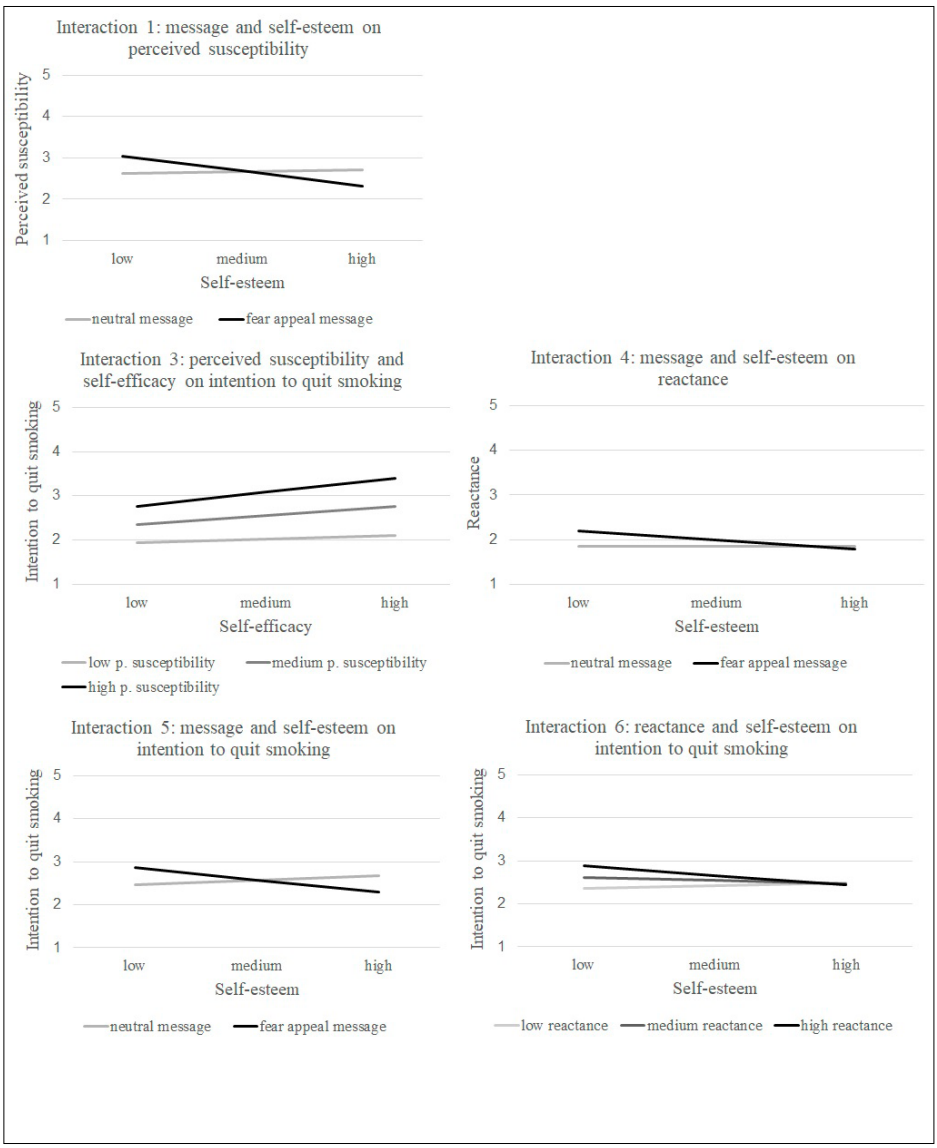


Note. The message including the neutral picture was coded as 0, and the message including the fear picture was coded as 1; N = 323; b = regression coefficient; interactions confirming the assumptions are in bold; † p < .10; *p < .05; **p < .01; ***p < .001.

The relation between the message and reactance was significantly related by trend (b = .14, SE = .07, t = 1.84, p = .06), suggesting that the fear appeal message elicited higher reactance than the neutral message. Moreover, this relation was moderated by self-esteem (b = –.24, SE = .10, t = –2.56, p = .01). The interaction suggests that the lower smokers' self-esteem, the higher their reactance when faced with a fear appeal. This finding is in the opposite direction to that hypothesized. Thus, H4, which predicted that the association between the message and reactance would be positively moderated by self-esteem, was not supported (Figure 4, interaction 4). The relation between the message and intention to quit smoking was not significant (b = .01, SE = .12, t = .06, *ns*), but was moderated by self-esteem (b = –.49, SE = .14, t = –3.35, p < .001). This interaction was in the expected direction. Figure 4 (interaction 5) shows that a fear appeal elicited higher intention to quit when smokers had low self-esteem,

whereas it elicited lower intention to quit when smokers had high self-esteem. Thus, H5, which predicted that the association between the message and intention to quit smoking would be negatively moderated by self-esteem, was supported.

Figure 4. Visualizations of all significant interaction effects



Finally, the association between reactance and intention to quit smoking was significant (b = .18, SE = .08, t = 2.11, p = .04), and this association was moderated by self-esteem (b = –.25, SE = .10, t = –2.39, p = .02). Figure 4 (interaction 6) il-

lustrates that the lower smokers' self-esteem and the higher their reactance, the more they intended to quit; the association was not found for smokers with higher self-esteem. Thus, H6, which predicted that the association between reactance and intention to quit smoking would be negatively moderated by self-esteem, was confirmed.

6. Discussion

The present study aimed to contribute to a deeper understanding of the circumstances under which a fear appeal leads to message acceptance and under which it prompts a defensive reaction to the message. Based on the theory of self-consistency, self-esteem was included as a moderator in the EPPM. The message had no significant effect on perceived susceptibility or on intention to quit; however, including self-esteem as a moderator revealed that after viewing a fear appeal, smokers with lower self-esteem showed increased perceived susceptibility and intention to quit smoking. In contrast, smokers with higher self-esteem showed decreased perceived susceptibility and intention to quit smoking which is in line with the assumptions. Thus, the study confirmed that self-esteem determined the accepting and defensive reactions of smokers to a fear appeal. Furthermore, the more smokers felt susceptible, the more they intended to quit, which is consistent with previous research (e.g., McCaul et al., 2006). In line with the EPPM (Witte, 1992), self-efficacy contributed to stronger intentions to quit. As reported previously (e.g., LaVoie et al., 2017), fear appeals elicited higher reactance than a neutral picture. However, some unexpected results were found regarding reactance. First, reactance increased when perceived susceptibility was higher, but was not influenced by smokers' self-efficacy. This does not correspond to the EPPM (Witte, 1992). Second, smokers with higher self-esteem did not show significantly increased reactance. Rather, low self-esteem increased reactance both directly and indirectly via perceived susceptibility. However, results confirmed the assumption that smokers' level of reactance seem to depend not only on their self-esteem, but also on the amount of increased perceived susceptibility. It can be concluded that self-esteem determines the extent to which perceived susceptibility, reactance, and intention to quit smoking are increased by a fear appeal, whereas self-efficacy determines the extent to which perceived susceptibility further increases the intention to quit. Finally, in line with recent research (Cho et al., 2016; van 't Riet & Ruiter, 2013), reactance was positively associated with the intention to quit smoking, and as expected low self-esteem strengthened this positive relation.

At first sight, it is surprising that fear appeals have both desirable and undesirable outcomes for smokers with lower self-esteem; i.e., increased perceived susceptibility, higher intention to quit, and increased reactance. However, whether increased reactance can be considered an undesirable outcome is questionable, after all reactance was positively related to intention to quit for smokers with low self-esteem. These results are consistent with the suggestion that reactance is an expression of concern (Cho et al., 2016) or serves to control negative emotions (van 't Riet & Ruiter, 2013). Thus, for smokers with low self-esteem reactance in

health-related behavior may reflect engagement with the message rather than indicating an unwillingness to quit.

For smokers with high self-esteem, as expected, viewing a fear appeal reduced their perceived susceptibility. This finding most likely reflects a defensive reaction to fear appeals in an attempt to reduce cognitive dissonance (e.g., Aronson, 1986; Glock & Kneer, 2009). Consequently, their intention to quit also decreased. Therefore, it is surprising that smokers with high self-esteem did not show increased reactance toward the fear appeal. Cognitive elaboration of the message may be required when responding to the items on the reactance scale, such as "the message threatened my freedom to choose." The present results suggest that smokers with higher self-esteem suppressed the threat and might not even have been aware of their defensive reactions. This suggests that the higher smokers' self-esteem, the less responsive they were to the message, in contrast however, the lower the smokers' self-esteem the more responsive they were to the message.

As mentioned, and rather surprisingly, higher levels of perceived susceptibility also increased the chances of reactance independently of self-efficacy. In a review, Popova (2012) confirmed that some studies found no relation between self-efficacy and defensive reactions. Feeling susceptible to the health-related risks of smoking might never be pleasant. It is thus likely that increased perceived susceptibility fosters negative feelings, independent of smokers' self-efficacy. These negative feelings might increase reactance in smokers, even if they perceive themselves as having enough self-efficacy to quit smoking. In line with these reflections, Leventhal's (1970) parallel process model described the possibility of simultaneous defensive and accepting processes.

To summarize, this is the first study to suggest that low self-esteem contributes to higher message acceptance. It is also the first study to find a decline in perceived susceptibility in smokers with high self-esteem in contrast to those with low self-esteem when faced with a fear appeal. In addition, results confirm the recent findings that reactance does not necessarily have a negative impact on intention to quit (van 't Riet & Ruiter, 2013; Thrasher et al., 2016). The present study is also the first to find that the association between reactance and intention to quit can vary with smokers' level of self-esteem. This suggests that the reason for reactance might vary according to the self-esteem of the smokers. Thus, by considering the psychological trait of self-esteem, this study contributed to a deeper understanding of smoker's tendencies to either accept or reject the information in a fear appeal. According to the present findings, accepting and defensive reactions of smokers seem not to be contrarious reactions, but to occur in the same individuals when they engage with the fear appeal message.

6.1 Limitations and implications for future research

The results of this study suggest that reactance does not have negative effects on intention to stop smoking and might even have "beneficial" effects, especially for smokers with low self-esteem, however, the descriptive statistics show that reactance reactions were weak. Future work replicating this study might provoke stronger dissonance arousal by, for example, providing information that is less

self-efficacy-enhancing (Witte & Allan, 2000). When smokers with high self-esteem show higher cognitive engagement with the dissonance-arousing stimulus, they might decrease their perceived susceptibility while also increasing their levels of reactance. Based on the theory of self-consistency, reactance will have negative effects on the health-related behavior of these individuals. Consequently, eliciting higher dissonance should strengthen the interaction between reactance and self-esteem on intention to quit smoking.

The present study investigated the defensive reactions reactance and decreased perceived susceptibility. van 't Riet and Ruiter (2013) found that several defensive reactions, including avoidance and cognitive reappraisal, may aid persuasion. Moreover, Thrasher et al. (2016) confirmed a positive relationship between avoidance and quit attempts. Thus, it can be assumed that other defensive reactions may have similar effects on intention to quit when smokers' self-esteem is also considered. This assumption should be tested in future research.

In this study, the overall self-esteem of the participants was high (Table 1), and as such the findings are most probably valid for smokers with medium to very high self-esteem. As discussed above, it is plausible that people with high self-esteem do not question their behavior, whereas those with moderate levels of self-esteem might be more realistic and open to information from outside sources. However, people with very low self-esteem are likely to be depressed and anxious (Sowislo & Orth, 2013), probably making it difficult for them to incorporate information from outside sources. Thus, future studies investigating the effects of fear appeals should also include people with very low self-esteem.

The experimental design used in this study enabled the establishment of causal relationships between the message and the dependent variables. In addition, based on previous research (e.g., McCaul et al., 2006; Dillard & Shen, 2005), it is highly likely that perceived susceptibility and reactance are antecedents of intention to quit, as predicted. However, based on the present data the possibility that the effects of perceived susceptibility, reactance, and intention to quit occurred simultaneously, cannot be excluded. Moreover, behavior (i.e., smoking cessation) was not investigated. As intention strongly influences behavior (Sheeran, 2002), the effects found in this study might be valid for smoking cessation. However, little is known about the long-term effects of defensive reactions (van 't Riet & Ruiter, 2013). One of the few panel studies, conducted by Thrasher et al. (2016), found that increased perceived threat, increased self-efficacy, and avoidance of the message were positively related to quit attempts. Further panel studies should focus on the causal and temporal development of the smoking cessation process, by including self-esteem as a moderator.

In the pretest, the fear appeal had a greater fear-inducing effect than in the main study. This could be explained by the timing of the measurement. The manipulation check of the fear-appeal picture was measured directly after participants received the message. In the main study, fear manipulation was measured after participants finished answering the items measuring the dependent variables. This method avoided participants' awareness of their fear influencing their responses to the dependent variables. It is highly probable that in the main study, individu-

als had a similar amount of fear as they had in the pretest, but their fear decreased during the study.

Perceived severity and response efficacy were not included in the present study. However, based on the EPPM, the following assumptions can be derived: when individuals feel susceptible to the health consequences of smoking, reactance and intention to quit might be strengthened or weakened as a function of the perceived severity of the health consequences. Nonetheless, it is likely that smoking-related illnesses are considered severe (van 't Riet & Ruiter, 2013). In addition, when individuals feel able to quit (self-efficacy) but do not belief that quitting will improve their health (response efficacy), their quitting intention might be reduced. However, Thrasher et al. (2016) found that quit attempts were more strongly influenced by self-efficacy than by response efficacy. Future research might examine these findings in more depth by including self-esteem. However, perceived severity and response efficacy might differ in their influence on intention and behavior for risky behavior other than smoking.

In the present experiment, the manipulation worked well, and the experimental groups were randomized. Smokers saw the message just once, but for at least 30 seconds. Moreover, the picture was included in a self-efficacy-enhancing article. In everyday life, smokers might see warning labels and antismoking campaigns on several occasions for a few seconds at a time. The wear-in and wear-out effect states that advertisements gain influence when they are repeated, but lose influence when exposure occurs too often (e.g., White, Bariola, Faulkner, Coomber, & Wakefield, 2014). It is thus expectable that in a real-world situation, the effects found in this study may be similar (Mook, 1983), which should be investigated into in future research.

6.2 Implications for tobacco-prevention communication

As discussed, the present results suggest that smokers with low self-esteem may engage with and respond positively to a media message, whereas those with high self-esteem may not. Campaign planners and other communicators therefore need to be aware that they are probably communicating primarily with individuals with low self-esteem. Of course, this does not mean that self-esteem determines quitting intentions, as self-esteem was not significantly related to quitting intentions (Table 1). However, the results suggest that the lower smokers' self-esteem, the more ready they are to accept a media message. As they think poorly of themselves (Peterson et al., 2008), it is likely that they trust information that comes from an outside source. Smokers with high self-esteem, in contrast, think positively about themselves (Peterson et al., 2008) and thus are more likely to trust their own judgment than a media message. It can be assumed, therefore, that smokers with high self-esteem decide by themselves when they want to quit, independent of external messages.

Moreover, as reactance was not negatively related to intention to quit, it does not appear to have any negative effects on the smoking-cessation process. Rather, results indicate that smokers who engaged with the message, intended to quit more, but also however displayed increased levels of reactance. Thus, the present

results suggest that for campaign planners it might be worth focusing on increasing engagement of smokers with the message, instead of trying to avoid reactance reactions.

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