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Does Smokers' Self-Construal Moderate the Effect of (Self-)persuasion on Smoking?

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Research has shown that self-persuasion is more effective in increasing smokers' risk perception and decreasing short-term smoking behavior compared to the traditional direct persuasion. However, the role of self-construal, which is closely associated with how one perceives persuasive messages, is not explored. The current research filled this gap by introducing self-construal to the self-persuasion literature to investigate its potential moderating role. Throughout five studies, we measured daily smokers' chronic self-construal (Study 1–3), selected smokers with different culturally-nurtured self-construal (Study 4), and primed situational self-construal (Study 5) to examine the role of self-construal in regard to smokers' cognition, attitude, and short-term smoking behavior, after being targeted by direct- or self-persuasion. Health warnings on cigarette packages and text regarding the negative consequences of smoking were used as direct persuasive messages. Adapted versions of health warnings and an argumentation task were used to induce self-persuasion. Null results were obtained from most of the studies. The overall support for the null hypothesis, however, remains weak and needs to be further verified. Limitations and future research direction are discussed.

Keywords: social influence; self-persuasion; direct persuasion; self-construal; smoking cessation

Introduction

Smoking is one of the severest health risks: according to the World Health Organization (WHO), the global tobacco epidemic kills over five million people each year, and without any interventions, this number will rise to eight million per year by 2030 (WHO, 2015). Meanwhile, the average age of smoking onset is declining year by year (Schneider, Mohnen, & Pust, 2008). The result of the Global Youth Tobacco Survey conducted in 25 European countries showed that 22% of boys and 18% of girls aged 13–15 years smoked cigarettes (Baška, Warren, Bašková, & Jones, 2009). For Asian countries, the smoking problem seems even more severe. A report from Tan (2012) declares that 'the world's two most populous nations – India and China – are home to more smokers than the entire population of the European Union. In China, more than 300 million people are tobacco users, while India adds another 275 million to the tally' ('Smoking in Asia', para. 2). Additionally, an investigation of 195 countries and territories from 1990 to 2015 reported that four countries accounted for 52.2% of global deaths from smoking, of which China and India played a significant role (Reitsma et al., 2017).

Given this situation, the health risks associated with tobacco use are highlighted in public campaigns as a way to strengthen smokers' smoking cessation activities, aiming to motivate them to smoke less or even to quit smoking. Therefore, tobacco warning labels are widely used and printed on tobacco products (Glock & Kneer, 2009; Strahan et al., 2002). Due to these efforts, the vast majority of smokers are by now well aware of the dangers of tobacco use (e.g., Dawson, Cargo, Stewart, Chong, & Daniel 2012; Kneer, Glock, & Rieger, 2012). However, the effects on smoking cessations are disappointing: experimental studies reported a rather low success rate of these campaigns. It has been argued that the techniques used in traditional anti-smoking campaigns often directly provide people with information emphasizing the negative consequences of smoking, which in turn can lead to recipients' experience of psychological reactance (Erceg-Hurn & Steed, 2011; Kok, Peters, Kessels, Ten Hoor, & Ruiter, 2018; Wolburg, 2006). As a consequence, the persuasive messages can even produce a boomerang effect and increase smoking (Grandpre, Alvaro, Burgoon, Miller, & Hall, 2003). Moreover, information against smoking always emphasizes the potential risks and alerts smokers by announcing the severe consequences (e.g., 'Smoking causes lung cancer', 'Smoking kills'), which could activate smokers' negative emotions, and thereby cause their defensive responses to the fear-arousing information (Croyle, Sun, & Louie, 1993; Ruiter & Kok, 2005; Peters, Ruiter, & Kok, 2013).

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Self-persuasion versus direct persuasion

Compared to direct persuasion, self-persuasion, that is, generating one's own arguments to change attitudes or behavior, has been argued to be a more powerful method of attitude and behavioral change, and often leads to more long-lasting effects (Aronson, 1999). A growing line of studies supports the notion that self-persuasion holds great promise in positively influencing people's attitudes and behaviors in health-related fields. For example, it was found that smoking-related risk perception increased after participants were exposed to warning labels formulated as questions (Glock, Müller, & Ritter, 2013). Müller and colleagues (2009, 2016) successfully decreased smokers' short-term smoking behavior through self-persuasion by instructing people to write down their own arguments, and by exposing participants to smoking warnings formulated as open questions. Furthermore, self-persuasion was proven effective to limit alcohol consumption by increasing individuals' negative outcome expectancies (Krischler & Glock, 2015). Likewise, Loman and colleagues (2018) found that self-persuasion can lead to more positive evaluations for persuasive messages, lower recognition of persuasive intent, and lower experienced negative affect, and can successfully reduce alcohol consumption compared to direct persuasion.

Self-persuasion and self-construal

Self-persuasion is a cognitive process highly related to self, as the generated messages are both from and for oneself. Markus and Kitayama (1991) proposed in their seminal work that the outcome of a cognitive activity which implicates self would be largely influenced by the nature of the self-system. Later, a huge body of research confirmed this notion, addressing the self-system as a great influence on people's cognition, emotion, motivation, and social behaviors (e.g., Gelfand et al., 2007; van Baaren, Maddux, Chartrand, de Bouter, & van Knippenberg, 2003). As universally acknowledged, two divergent but closely-linked self-systems, that is, *independent self-construal* and *interdependent self-construal*, were regarded as striking factors for distinguishing cultures (e.g., Cross, Hardin, & Gercek-Swing, 2011; Gudykunst et al., 1996; Markus & Kitayama, 1991). Describing the way in which people construe the self, self-construal refers to the extent to which a person thinks of himself as independent from or interdependent with social others (Markus & Kitayama, 1991). Specifically, independent self-construal refers to the view of oneself as defined by unique attributes and characteristics that distinguish from others, while interdependent self-construal is labeled as the view of oneself as defined by relationships with others. With the motivation of 'standing out', people with independent self-construal seek and maintain their independence by attending to themselves and by expressing their uniqueness and inner attributes. Consequently, they highly value their own ideas, thoughts, and principles. In contrast, people with an interdependent self-construal focus on keeping harmony in relationships, groups, and society to which they belong. They have a higher demand for being socially accepted and are more flexible and ready to fit in, and they are more context-dependent (Kühnen, Hannover, & Schubert, 2001).

Although it is known that how people construe the self could influence self-related cognitive activities, its influence on the effectiveness of self-persuasion is yet to be examined. To the best of our knowledge, self-persuasion studies have until now been exclusively conducted in Western countries (e.g., Baldwin, Rothman, van der Weg, & Christensen, 2013; Bernritter, van Ooijen, & Müller, 2017; Shaw et al., 2015), where people on average hold the independent self-construal (e.g., Cross, et al., 2011; Gudykunst et al., 1996). With regard to smoking, it has been found that question-formulated warning labels successfully increased smoking risk perception and decreased short-term smoking behavior among German and Dutch smokers (Glock, et al., 2013; Müller et al., 2016). But does self-persuasion lead to comparable results for interdependent smokers? Answering this question is clearly of great importance for both theory and practice. Theoretically, introducing self-construal into the persuasion literature can provide a deeper understanding of the boundary conditions of certain persuasive techniques and clarify the related underlying processes. Practically, it is crucial to develop optimal persuasive messages for interdependent smokers, since smoking behavior is a severe problem not only in Western countries where independent self-construal dominates, but also in many Eastern countries, where most people hold the interdependent self-construal (Chen et al., 2015; Koplan & Eriksen, 2015; Tan, 2012).

Hypotheses

We hypothesized self-construal would moderate the effectiveness of (self-)persuasion on smoking-related outcomes in the way that independent smokers benefit more from self-persuasion and interdependent smokers benefit more from direct persuasion. The reasons are as follows.

The biggest difference between the two persuasive techniques is reflected in different sources. Self-persuasive messages are generated by oneself based on one's own ideas and opinions. Direct persuasive messages are given by others, in the context of anti-smoking campaigns oftentimes from public, societies, or governments. Since independent people abide by their own thoughts and principles, they would highly value and follow the thoughts triggered by self-persuasive messages. However, interdependent people would be more open to given messages since they tend to obey and conform to society and social others. By doing so, chances of being socially accepted and maintaining self-images as a member in groups or society increase (Liu, 1986; Markus, Kitayama, 1991; Triandis, 1995; Yuki, Maddux, Brewer, & Takemura, 2005).

In addition, Damen and colleagues (2015) have found that the effectiveness of self-persuasion highly depends on individuals' experienced agency: self-persuasion/direct persuasion is more effective for people with high/low feelings of agency and control of the situation. By giving people chances to produce their own ideas, self-persuasion increases their sense of being an independent agent and the control of the situation. It responds well to independent individuals' need to express their own thoughts and feelings, and thus works better in changing their attitudes. However, instead of valuing control over situations, interdependent individuals appear to use secondary

control, which involves limiting personal autonomy and enhancing alignment in order to fit in (Weisz et al., 1984). This may, to a certain extent, weaken the effectiveness of self-persuasion for interdependent people.

Furthermore, it has been argued that cognitive dissonance would emerge when people realize that their behavior is not in line with self-arguments produced during the self-persuasion process. To diminish this inner discomfort, attitude and behavior will be altered to be consistent with the self-persuasive arguments (Aronson, 1999). When one thinks about the negative consequences of smoking and the fact that he/she smokes every day, he/she is supposed to change smoking attitudes and behavior as a way to decrease the discomfort. However, this may not apply to interdependent individuals since they have a more flexible self and are more context-dependent. As discussed by several researchers (e.g., Gawronski, 2012; Morris & Peng, 1994), Easterners tend to explain their behaviors in terms of situational demands to reduce cognitive dissonance. Instead of changing attitude or behavior in line with what they declared, they may either regard the self-persuasive arguments as a response to a certain task or regard their smoking behavior as a situational need. As such, self-persuasion might not be the optimal persuasion technique for interdependent individuals. Following the same reason, a different function of direct persuasion should be expected for independent and interdependent people. Research in western contexts shows that direct health messages that highlight health risks can pose a significant threat to people's self-integrity. Consequently, people tend to process these health messages defensively (Zhao, Peterson, Kim & Rolfe-Redding, 2014). However, interdependent people's self-integrity would hardly be influenced in the same way, since the centrality of their preference is achieving a context-contingent self rather than stability and internal consistency (Riemer, Shavitt, Koo & Markus, 2014). With a more flexible self and higher obedience and respect for authority, interdependent people would be more able to adjust their attitudes and behaviors to be compliant with those direct persuasive messages that are presumably from the society.

We examined our hypotheses with five studies by measuring participants' chronic self-construal in Western cultures (Study 1–3), selecting participants from Western (chronic independent self-construal) and Eastern cultures (chronic interdependent self-construal; Study 4), and priming participants with either independent or interdependent self-construal (Study 5).[1] A full disclosure package of all the studies can be found at https://osf.io/gp5y6/.

Study 1

In Study 1, participants' self-construal was measured, and they were presented with several warning labels that emphasize the negative consequences of smoking. The labels were either formulated as statements (e.g., 'Smoking causes fatal lung cancer') or questions (e.g., 'What are the effects of smoking on your lungs?') to induce direct persuasion and self-persuasion (see also Glock et al., 2013; Müller et al., 2016). Keeping it as realistic as possible, we selected currently-used warning labels on cigarette packages as direct persuasive messages

and did not specify where these messages came from. In addition, we added labels that challenge smokers' positive outcome expectancies towards smoking (POE-related labels), since several researchers have pointed out the importance of studying smokers' smoking outcome expectancies (e.g., Glock, Unz, & Kovacs, 2012; Glock et al., 2013). It was found that smokers often expected negative consequences when it comes to the health aspect, while expected positive consequences when it comes to social reasons and mood management (Glock et al., 2013). Therefore, we also included POE-related labels to explore whether its effects differ from the traditional health-related warning labels.

Method

Participants and design. A 2 (persuasion: self-persuasion vs. direct persuasion) × 2 (label content: health-related label vs. POE-related label) between-subjects design was used, with persuasion and label content as factors, self-construal as a continuous predictor, and attitude towards smoking and risk perception towards smoking as the dependent variables.

This study was programmed in Google Forms and disseminated via the experiment platform SONA, the experimenter's and colleagues' social networks (e.g., Facebook), and via flyers handed out to smokers on Radboud University campus. As many daily smokers aged over 18 as possible were sampled, and in the end, 137 participants were recruited. The compensation was a lottery to win one of four 25-euro shop coupons. Eighteen participants were excluded because they made more than two mistakes in the attention check task (see detailed description in 'Procedure and Materials'). Therefore, 119 participants (70 females, age ranging from 18 to 70, M_{age} = 26.42 years, SD_{age} = 9.84) were included in the final analysis.

Procedure and materials. To filter out the disqualified participants, participants were first asked about age and whether they smoke on a daily basis. Those who are over 18 and smoke daily proceeded the study and received following tasks in Dutch, German, or English (most of the participants were students on Radboud campus, who came from the Netherlands or Germany) according to their mother tongue. All participants were asked to complete the demographic questions (i.e., gender, education) and smoking habit questions (i.e., years of smoking, the number of cigarettes smoked per day, the number of cigarettes smoked on the day of the experiment). Subsequently, they were told that the first part of the experiment is a personality survey, in which they need to complete the Self-Construal Scale (Singelis, 1994) using a 7-point Likert scale. It included 24 items, with 12 items regarding independence (Cronbach's α = 0.70) and 12 items regarding interdependence (Cronbach's α = 0.74). Participants' final self-construal scores were calculated by subtracting the standardized interdependence score from the standardized independent score (see Hannover, Birkner, & Pöhlmann, 2006), with a higher score meaning stronger independence (unstandardized self-construal ranging from –24 to 31, unstandardized $M_{self\text{-}construal}$ = 5.00, unstandardized $SD_{self\text{-}construal}$ = 11.58).

After the self-construal measure, all participants were told that the second part aims to understand people's cognition about smoking, and were then randomized to one of the four experimental conditions mixed by persuasion type and label content. In each condition, participants were instructed to carefully watch a three-minute video clip that contained 13 labels on cigarette packets (Glock et al., 2012; Glock et al., 2013). Each label was displayed for 15 seconds. Direct persuasion labels were formulated as statements and self-persuasion labels were formulated as questions (see Glock et al., 2013; Loman et al., 2018; Müller et al., 2016). Health-related label content or POE-related label content was emphasized in both statements and questions (all labels can be found in the Replication package). We achieved the randomization by an item asking participants to click on the number which appears at the top of the options list. The numbers 1, 2, 3, 4 were given as four options and automatically raffled by Google Forms so that any number could be randomly present on the top. Each number was blocked with one specific experimental condition.

After watching the video, participants were instructed to complete the dependent measures. Attitude towards smoking was measured by eight semantic differential items (e.g., 'good–bad', 'pleasant–unpleasant') on a 7-point Likert scale (Cronbach's α = 0.69; Huijding & De Jong, 2006). For further analyses, the scores of items 3, 5, 7, and 8 were reversed. Scores on all items were summed, with a higher overall score representing a more negative attitude towards smoking. To assess risk perception towards smoking, participants were asked to evaluate the likelihood of developing one of six smoking-related diseases during their lifetime (e.g., 'How likely is it for you to develop lung cancer?') on a 10-point Likert scale, ranging from 'no risk at all' to 'the highest risk' (Cronbach's α = 0.90; Glock et al., 2013). Scores on all items were summed, with a higher overall score representing a higher risk perception.

Subsequently, all participants received an attention check task. They were given five labels and asked to indicate whether the labels were previously presented in the video or not. Out of the five labels, three were derived from the video, and two were filler labels with comparable content. Only participants who gave at least three correct answers were included in the final analysis. Finally, participants completed a suspicion probe and were thanked. After data collection was completed, all participants were debriefed via email and added to an online lottery software. The four winners received the coupons by mail.

All the data of the current research were stored on the RU file server according to the data management protocol of Behavioural Science Institute, Radboud University.

Results and Discussion

The statistical analyses were conducted in SPSS 25 and JASP 0.8.4 (JASP Team, 2017). First, ANOVAs with persuasion and label content as two independent variables were conducted on the four secondary variables as randomization checks (**Table 1**). No main effects or interaction effects were found (minimal p = 0.058, maximal ηp^2 = 0.031), indicating that the randomization was successful.

To test our hypotheses, a MANOVA was conducted on attitude and risk perception, with persuasion and label content as factors, and self-construal as a covariate. Specifically, all the three-way and two-way interactions between persuasion, label content and self-construal were included in the model to investigate the assumed moderation effect. Using Pillai's trace, the multivariate testing showed a significant three-way interaction (V = 0.08, $F(2, 110)$ = 4.81, p = 0.010, ηp^2 = 0.080) and a significant two-way interaction between persuasion and self-construal (V = 0.06, $F(2, 110)$ = 3.63, p = 0.030, ηp^2 = 0.062).

Univariate testing showed a significant three-way interaction between persuasion, label content, and self-construal on attitude towards smoking, $F(1, 111)$ = 5.92, p = 0.017, ηp^2 = 0.051; and a significant two-way interaction between persuasion and self-construal, $F(1, 111)$ = 4.18, p = 0.043, ηp^2 = 0.036. All the other main effects and interaction effects on attitude did not reach significance (minimal p = 0.130, maximal ηp^2 = 0.021). Breaking down the three-way interaction, the interaction between persuasion and self-construal was only significant under the condition of health-related labels, $F(1, 52)$ = 8.03, p = 0.007, ηp^2 = 0.134. No significant two-way interaction was found under the condition of POE-related labels, p = 0.759, ηp^2 = 0.002 (**Figure 1**). Simple slope analysis showed a significant effect of self-construal on attitude towards smoking for participants who were exposed to the direct-persuasive health-related labels, B = 2.38, p = 0.037, 95% CI [0.16, 4.60]. For participants who were exposed to the self-persuasive health-related labels, the effect showed a non-significant trend, B = −1.36, p = 0.099, 95% CI [−2.99, 0.27].

Similarly, univariate testing showed a significant three-way interaction between persuasion, label content, and self-construal on risk perception, $F(1, 111)$ = 4.15, p = 0.044, ηp^2 = 0.036. All the other main effects and interaction effects did not reach significance (minimal p = 0.067,

Table 1: Mean scores and standard deviations on secondary variables of Study 1.

	DP & Health (N = 27)	DP & POE (N = 32)	SP & Health (N = 29)	SP & POE (N = 31)
Number of cigarettes smoked per day	9.89 ± 7.02	10.38 ± 7.67	9.03 ± 4.95	10.32 ± 6.76
Number of cigarettes smoked on the day of the experiment	3.41 ± 2.59	3.50 ± 3.24	4.35 ± 4.21	4.81 ± 5.50
Number of years smoked	11.56 ± 11.02	10.34 ± 12.48	8.03 ± 7.61	7.15 ± 5.30
Education	3.00 ± 0.73	2.63 ± 0.75	3.00 ± 0.71	2.87 ± 0.76

Note: Education was reported on a 5-point scale: 1 = lower than high school; 2 = high school; 3 = bachelor; 4 = master; 5 = doctor. DP: direct persuasion, SP: self-persuasion, Health: the health-related labels, POE: the POE-related labels.
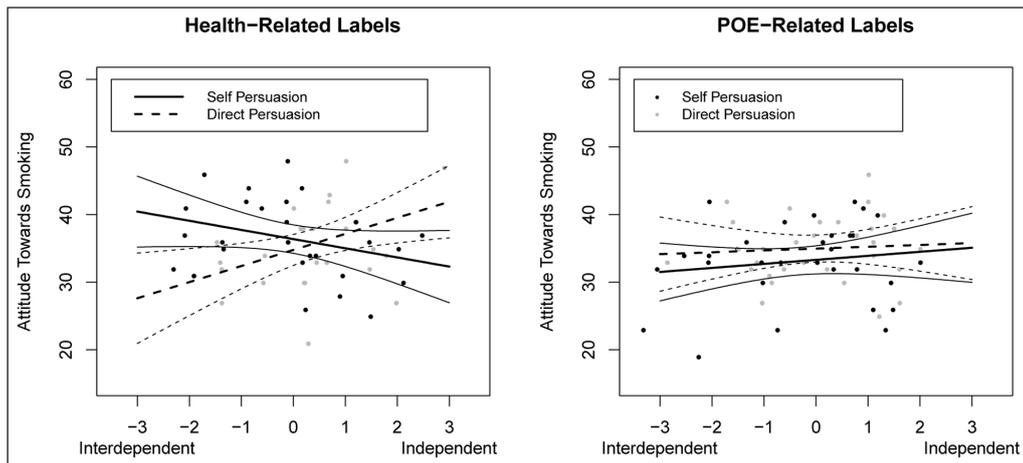
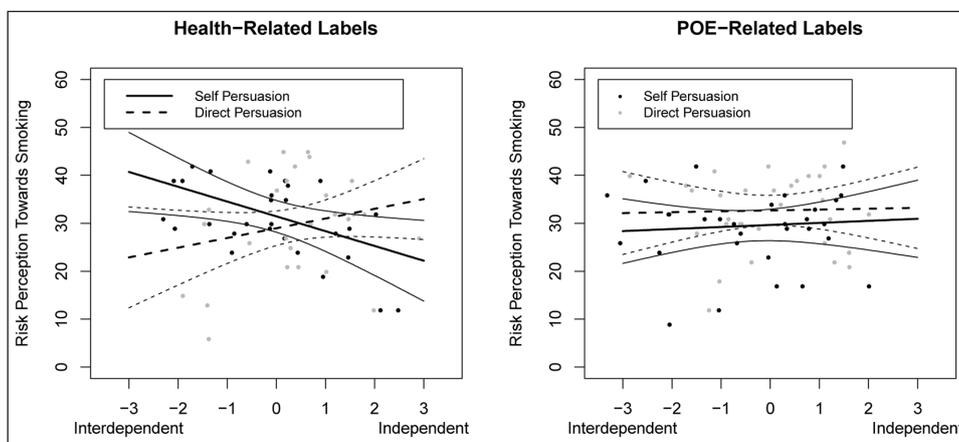**Figure 1:** Effect of self-construal on attitude towards smoking.

Figure 2: Effect of self-construal on risk perception towards smoking.

maximal $\eta p^2 = 0.030$). Breaking down the three-way interaction, again the result showed the interaction between persuasion and self-construal was only significant under the condition of health-related labels, $F(1, 52) = 6.15$, $p = 0.016$, $\eta p^2 = 0.106$. No significant two-way interaction was found under the condition of POE-related labels, $p = 0.884$, $\eta p^2 = 0.000$ (**Figure 2**). Simple slope analysis demonstrated that the effect of self-construal on risk perception was significant for participants who were exposed to the self-persuasive health-related labels, $B = -3.09$, $p = 0.014$, 95% CI [−5.50, −0.68]. For participants who were exposed to the direct-persuasive health-related labels, the effect was not significant, $B = 2.03$, $p = 0.258$, 95% CI [−1.58, 5.63].

To further investigate the three-way interaction between persuasion, label content, and self-construal, Bayesian Linear Regressions were performed on smoking attitude and risk perception. Similar results were obtained as the results from the Null Hypothesis Significant Test (NHST): On attitude, there was moderate evidence supporting the inclusion of the three-way interaction, BF10 = 4.654. On risk perception, there was anecdotal evidence supporting the inclusion of the interaction, BF10 = 2.355.

These results suggested that self-construal only moderates the effect of (self-) persuasion on smoking-related outcomes when the persuasive messages are health-related. When the messages are designed to challenge

smokers' positive outcome expectancies, no significant interactions between persuasion and self-construal were found. The main effect of label content was not significant, which is in line with previous findings obtained by Glock and colleagues (2013): The POE-related labels did not differ from the health-related labels in influencing smokers' smoking behavior. Therefore, POE-related labels were excluded from the following studies.

Unexpectedly, participants with independent self-construal showed a more negative attitude towards smoking after exposure to direct persuasive health-related labels, and participants with interdependent self-construal showed a higher risk perception towards smoking after exposure to self-persuasive health-related labels. The reason could be that people with different self-construal have different tendencies to generate negative predictions about the future. In particular, researchers found that interdependent people tend to generate more negative predictions and prepare for negative predicted outcomes more readily than independent people (Dean & Gardner, 2014). It is possible that in the present study, interdependent smokers generated more negative arguments towards the self-persuasion questions than independent smokers, which resulted in a higher risk perception towards smoking. However, it is hard to explain why independent smokers were more vulnerable to direct persuasive labels.

It is important to mention that the high uncertainty about the expected effect size had made it difficult to estimate a proper sample size, and due to resource constraints, we had to stop data collection at a certain point. These two points make the evidence of the obtained results relatively weak. To clarify the unexpected direction of the interactions and further investigate the moderation effect of self-construal, a second study was conducted in which a different paradigm was used to induce direct persuasion and self-persuasion. Participants were asked to either read some provided arguments about the negative consequences of smoking, or to generate arguments by themselves. In addition, since intention was found to be a strong predictor of actual behavior (e.g., Topa & Moriano, 2010), intention to limit smoking was included as another dependent variable in Study 2 to provide more information.

Study 2
Method
Participants and design. A single-factor (persuasion: self-persuasion vs. direct persuasion) between-subjects design was used, with persuasion as the factor, self-construal as a continuous predictor, and attitude, risk perception, and intention to limit smoking as dependent variables. With an estimated effect size $\eta p^2 = 0.106$ (based on Study 1) for the proposed interaction between persuasion and self-construal, a prior power analysis indicated 69 participants for achieving 80% power when 5% was used as the alpha level. For Study 2 and all following studies, we used G*Power to conduct the power analyses (Faul, Erdfelder, Lang, & Buchner, 2007).

Study 2 was programmed in Google Forms and disseminated in the same way as in Study 1. Seventy-five daily smokers participated in this study for a lottery to win one of two 25-euro shop coupons. Six participants were excluded because they had already participated in Study 1. One participant was excluded because of failing in the attention check task. Sixty-eight participants (41 females, age ranging from 18 to 50, $M_{age} = 26.04$ years, $SD_{age} = 7.44$; unstandardized self-construal ranging from –25 to 39, unstandardized $M_{self\text{-}construal} = 7.57$, unstandardized $SD_{self\text{-}construal} = 11.81$) were included in the final analysis.

Procedure and materials. Similar to Study 1, participants were first directed to either the Dutch, German, or English version of the study and were then asked the demographic and smoking habit questions. Subsequently, they completed the Self-Construal Scale (Cronbach's α of the Independence items and the Interdependence items are 0.77 and 0.80, respectively). In both the direct persuasion and self-persuasion condition, participants were asked to read a paragraph with reasons why 'animal testing is bad'. Later participants in the direct persuasion condition were asked to read another paragraph with reasons why 'smoking is bad', while participants in the self-persuasion condition had to generate their own arguments about why 'smoking is bad' and to write them down (no minimum or maximum amount of arguments was required). The topic 'animal testing' served partly as an argumentation example, partly as a cover story (see Müller et al., 2009). Both paragraphs can be found in the Replication package.

After the persuasion manipulation, all participants were instructed to complete the dependent measures. Besides the two dependent variables used in Study 1,[2] intention to limit smoking was added as a new dependent variable. To access it, participants were asked to indicate their current thoughts about limiting smoking on three items using a 9-point Likert scale (Cronbach's $\alpha = 0.95$; Keer, van den Putte, Neijens, & de Wit., 2013), ranging from 'absolutely will not' to 'absolutely will'. An example item is 'I will try to limit my cigarette consumption'. Scores on all items were summed, with a higher overall score representing a higher intention to limit smoking.

Subsequently, participants in the direct persuasion condition encountered an attention check task and asked to indicate whether they saw seven sentences in the former task or not. Three sentences were derived from the smoking paragraph, two were fillers with comparative content, and two were fillers from the animal testing paragraph. Only those who gave at least three correct answers on the five smoking-related sentences were included in the final analysis. Lastly, all participants completed a suspicion probe and were thanked. After data collection was completed, all participants were debriefed via email. The lottery was drawn and coupons were sent to the winners by mail.

Results and Discussion
First, ANOVAs with persuasion as the independent variable were conducted on four secondary variables as randomization checks (**Table 2**). Differences were found on the number of cigarettes smoked per day ($p = 0.024$, $\eta p^2 = 0.074$), and the number of cigarettes smoked on the day of the experiment ($p = 0.044$, $\eta p^2 = 0.060$). Therefore, these two variables were controlled for in later analyses.

Table 2: Mean scores and standard deviations on secondary variables of Study 2.

	DP (N = 31)	SP (N = 37)
Number of cigarettes smoked per day	12.23 ± 7.07	8.78 ± 5.23
Number of cigarettes smoked on the day of the experiment	6.65 ± 5.39	4.30 ± 4.04
Number of years smoked	10.08 ± 7.11	8.05 ± 7.46
Education	3.06 ± 0.57	3.05 ± 0.78

Note: Education was reported on a 5-point scale: 1 = lower than high school; 2 = high school; 3 = bachelor; 4 = master; 5 = doctor. DP: direct persuasion, SP: self-persuasion.

To test our hypotheses, a MANCOVA was conducted on attitude, risk perception, and intention to limit smoking, with persuasion as the factor, and the two aforementioned control variables and self-construal as covariates. Specifically, the interaction between persuasion and self-construal was included in the model to investigate the proposed moderation effect. Using Pillai's trace, the multivariate testing showed that none of the effects reached significance (minimal $p = 0.115$, maximal $\eta p^2 = 0.093$).

Univariate testing found no significant main effects or interactions on attitude (minimal $p = 0.325$, maximal $\eta p^2 = 0.016$). A main effect of persuasion on risk perception was found, $F(1, 62) = 4.66$, $p = 0.035$, $\eta p^2 = 0.070$, showing that self-persuasion ($M = 33.78$, $SD = 9.18$) induced a higher risk perception than direct persuasion ($M = 30.48$, $SD = 7.94$).[3] However, the expected interaction between persuasion and self-construal on risk perception was not significant, $F(1, 62) = 0.84$, $p = 0.364$, $\eta p^2 = 0.013$. No significant main effects or interactions were found on intention to limit smoking (minimal $p = 0.476$, maximal $\eta p^2 = 0.008$).

Additional Bayesian Linear Regressions were conducted to verify the non-significant interactions between persuasion and self-construal obtained from NHST. For all three dependent variables, anecdotal evidence supporting the null hypothesis was found, $BF10_{attitude} = 0.724$; $BF10_{risk\ perception} = 0.613$; $BF10_{intention} = 0.597$.

In Study 2, we found a significant main effect of persuasion showing that self-persuasion efficiently increased smokers' risk perception, which is in line with previous findings (e.g., Glock et al., 2013). However, the proposed moderation effect of self-construal was not found. One possibility could be that this effect disappeared due to the differences in paradigms: Self-persuasion was manipulated by asking participants to watch the open questions in Study 1, whereas it straightforwardly required participants to think about and write the self-arguments down in Study 2, which could be too strong for a potential moderation effect to occur. Therefore, in Study 3, both paradigms were used to examine this possibility. Moreover, participants' cognitive effort in the persuasion tasks was measured to investigate whether those who write arguments exert more cognitive effort than those who read the arguments and watched the videos.[4] Study 3 was pre-registered on the Open Science Framework (https://osf.io/czhn9/).

Study 3
Method
Participants and design. A 2 (persuasion: self-persuasion vs. direct persuasion) × 2 (paradigm: video paradigm vs. text paradigm) between-subjects design was used, with persuasion and paradigm as factors, self-construal as a continuous predictor, and attitude, risk perception, and intention to limit smoking as dependent variables.

This study was programmed in Qualtrics and distributed via the online recruiting platform Prolific. Using an estimated effect size $\eta^2 = 0.042$ obtained by combining the former two studies, a prior power analysis indicated 182 participants for achieving 80% power when 5% was used as the alpha level. Two hundred and thirty-eight daily smokers participated for 1.7 pounds as compensation. None of these participants took part in previous

studies. Twenty-one participants were excluded because they spent less than 20 seconds ($M = 9.44$, $SD = 4.37$) in the 24-item Self-Construal Scale, indicating that they did not read the questions carefully. Twenty participants were excluded because they failed in the attention check task. Therefore, 197 participants (103 females, age ranging from 18 to 61, $M_{age} = 33.38$ years, $SD_{age} = 12.24$; unstandardized self-construal ranging from −29 to 46, unstandardized $M_{self\text{-}construal} = 5.66$, unstandardized $SD_{self\text{-}construal} = 13.96$) were included in the final analyses.

Procedure and materials. All materials were presented in English. Demographic and smoking habit questions were asked at the beginning of the study, and self-construal (Cronbach's α of the Independent items and Interdependent items are 0.81 and 0.78, respectively) was measured subsequently. The procedure of Study 3 was similar to previous studies, except for the following parts. Study 3 combined the two persuasion paradigms which were used previously. All participants were randomly assigned by the Qualtrics randomizer to one of the four conditions: watching the health-related statement video; watching the health-related question video, reading a text of arguments; or writing arguments by themselves. Cognitive effort was measured after the persuasion tasks, by three items on an 11-point Likert scale from 'not at all' to 'extremely' (Cronbach's α = 0.90; Petty, Harkins, Williams, & Latane, 1977). An example item is 'How much effort did you make to think about the video messages/to think about the content of the text provided/to generate the arguments while doing the task?'. Self-efficacy to limit cigarette intake was tested as an additional secondary variable, by a single item 'I can easily cut down the cigarettes I smoke' (Schüz, Eid, Schüz, & Ferguson, 2016) on a 7-point Likert scale from 'totally disagree' to 'totally agree'. The same dependent variables were measured as in Study 2.[5] After data collection was completed, all the participants were debriefed and compensated.

Results and Discussion
First, ANOVAs were done on all secondary variables with persuasion and paradigm as the independent variables as randomization checks (**Table 3**). The interaction between persuasion and paradigm was found to be significant on the number of cigarettes smoked per day ($p = .036$, $\eta p^2 = 0.023$). Therefore, it was controlled for in later analyses. All other main effects and interaction effects did not reach significance (minimal $p = 0.060$, maximal $\eta p^2 = 0.018$).

To test our hypotheses, a MANCOVA was conducted on attitude, risk perception, and intention to limit smoking, with persuasion and paradigm as factors, and the number of cigarettes smoked per day and self-construal as covariates. Specifically, all the three-way and two-way interactions between persuasion, paradigm, and self-construal were included in the model to investigate the proposed moderation effect of self-construal. Using Pillai's trace, the multivariate testing only showed a significant effect of one of the covariates – the number of cigarettes smoked per day, $V = 0.13$, $F(3, 180) = 8.70$, $p < 0.001$, $\eta p^2 = 0.127$.

Univariate testing showed that none of the main effects and interactions were significant on the three

Table 3: Mean scores and standard deviations on secondary variables of Study 3.

	DP & P1 (N = 50)	DP & P2 (N = 46)	SP & P1 (N = 51)	SP & P2 (N = 50)
Number of cigarettes smoked per day	10.82 ± 7.61(1)	12.33 ± 6.53(1)	12.84 ± 7.07(2)	9.85 ± 6.06(2)
Number of cigarettes smoked on the day of the experiment	4.16 ± 4.25	5.72 ± 6.03	5.90 ± 5.77(1)	5.96 ± 5.24
Number of years smoked	14.04 ± 11.54	15.78 ± 11.15(1)	16.10 ± 10.21	11.90 ± 11.97(4)
Education	2.48 ± 0.74	2.72 ± 0.81	2.57 ± 0.70	2.42 ± 0.61
Self-efficacy	4.20 ± 1.85	3.76 ± 1.64	4.49 ± 1.67	4.08 ± 1.76

Note: Education was reported on a 5-point scale: 1 = lower than high school; 2 = high school; 3 = bachelor; 4 = master; 5 = doctor. DP: direct persuasion, SP: self-persuasion, P1: the video paradigm, P2: the text paradigm. The number of missing values in each group is presented in brackets.

dependent variables (minimal p = 0.121, maximal ηp^2 = 0.013). Additional Bayesian Linear Regressions provided anecdotal evidence supporting excluding the three-way interaction between persuasion, paradigm, and self-construal, $BF10_{attitude}$ = 0.450; $BF10_{risk\ perception}$ = 0.409; $BF10_{intention}$ = 0.442.

A 2 (persuasion) × 2 (paradigm) ANOVA on cognitive effort showed a significant main effect of persuasion, $F(1, 193)$ = 6.49, p = 0.012, ηp^2 = 0.033: Surprisingly, participants exposed to self-persuasion reported less perceived cognitive effort (M = 22.46, SD = 7.13) than those exposure to direct persuasion (M = 25.02, SD = 7.23).

Results from this study showed that both the main effects and the moderation effect of self-construal were not significant, irrespective of which paradigm was used. It is important to mention, however, that most of the participants in the current and previous studies were from Western countries, which are often seen as more independent-oriented (e.g., Markus & Kitayama, 1991; Singelis, 1994; Triandis, 1989). Since self-construal is originally determined as culturally nurtured (Markus & Kitayama, 1991), one could argue that the current findings resulted from a predominantly independent sample which has less variation in self-construal. Therefore, we conducted Study 4 where participants were recruited from the U.S. and China – two prototypical cultures with independent and interdependent self-construal (e.g., Cross et al., 2011).

Study 4

In Study 4, a control condition was added in addition to the self-persuasion and direct persuasion conditions. Besides the three dependent variables we used before, two other variables were added: The number of cigarettes participants smoked within 24 hours after the experiment, and the change of craving for cigarettes before and right after the persuasion manipulation. The former was included as a behavioral index and the latter was added because the pretest-posttest design is introduced as a way to increase experiments' internal validity (Campbell & Stanley, 1963; Cook, & Campbell, 1979). Study 4 was pre-registered on the Open Science Framework (https://osf.io/gw8rb/).

Method
Participants and design. A 3 (persuasion: self-persuasion vs. direct persuasion vs. no persuasion) × 2 (culture: China vs. the U.S.) between-subjects design was used, with persuasion and culture as independent variables, and the five smoking-related outcomes as dependent variables.

In case there is a moderation effect, a relatively small effect size ηp^2 = 0.03 (Cohen, Cohen, West & Aiken, 2003) for the significant interaction between persuasion and culture should be achieved. Therefore, we estimated a minimum sample size of 315 (α = 0.05, 1–β = 0.80, ηp^2 = 0.03), resulting in a minimum sample size of around 160 of each culture. The present study was programmed in Qualtrics both in English and Chinese. U.S. participants were recruited on MTurk, and Chinese participants were recruited via the Students Forum (Southwest University, China) and via the social network of a Chinese research assistant. The U.S. study link was entered 357 times on MTurk. However, after excluding the data which were not validated (for a detailed exclusion criteria, please see pre-registration of this study), 203 U.S. participants (112 females, age ranging from 18 to 73, M_{age} = 38.14 years, SD_{age} = 11.29; unstandardized self-construal ranging from –40 to 48, unstandardized $M_{self-construal}$ = 7.12, unstandardized $SD_{self-construal}$ = 13.31) were included in the final analyses. The Chinese study link was entered 810 times in total. According to the same exclusion criteria, 193 Chinese participants (37 females, age ranging from 18 to 68, M_{age} = 30.48 years, SD_{age} = 9.94; unstandardized self-construal ranging from –30 to 32, unstandardized $M_{self-construal}$ = –3.73, unstandardized $SD_{self-construal}$ = 10.97) were included in the final analyses. None of these participants participated in previous studies. As compensation, each U.S. participant was paid 1 dollar and each Chinese participant was paid 10 RMB.

Procedure and materials. Both Chinese and U.S. participants' chronic self-construal was measured by the Self-Construal Scale (Singelis, 1994) at the beginning of the study (Cronbach's α of the Independent items and Interdependent items are 0.79 and 0.86, respectively). Subsequently, participants were randomly assigned by the Qualtrics randomizer into self-persuasion condition, direct

persuasion condition, or control condition. The same text paradigm as in Study 2 was used. In the control condition, no persuasion task was given, and thus participants immediately received dependent measures after the self-construal measurement. In addition to previously-used dependent variables (i.e., attitude, risk perception, intention to limit smoking),[6] two more variables were assessed. The craving for cigarettes was tested before and right after persuasion tasks: All participants were asked to indicate their craving for cigarettes on a 7-point Likert scale from 'not at all' to 'very much' at those two moments. Furthermore, on the following day, we sent participants a message asking the number of cigarettes they smoked within 24 hours after the experiment. In addition to the original attention check items, one item 'For this item, please click 1' was assembled in the attitude scale, to check whether the participants paid attention to the task. After data collection was completed, all the participants were debriefed and compensated.

Results and Discussion

First, an independent-samples t-test was conducted to compare self-construal scores between Chinese and U.S. participants. As expected, U.S. participants ($M = 0.31$, $SD = 0.98$) had significant higher score than Chinese participants ($M = -0.33$, $SD = 0.82$) in self-construal, $t(1, 394) = 7.06$, $p < 0.001$, indicating that U.S. participants held a more independent chronic self-construal.

ANOVAs were done on all secondary variables with persuasion and culture as the independent variables as randomization checks (**Table 4**). The main effect of culture was found significant on the number of cigarettes smoked per day ($p = 0.004$, $\eta p^2 = 0.022$); on the number of cigarettes smoked on the day of the experiment ($p < 0.001$, $\eta p^2 = 0.032$); on the number of years smoked ($p < 0.001$, $\eta p^2 = 0.143$); and on education ($p = 0.001$, $\eta p^2 = 0.030$). Therefore, these four secondary variables were controlled for in later analyses.

To test whether the effect of persuasion on attitude, risk perception, and intention to limit smoking differed between two cultures, a MANCOVA was conducted on these three dependent variables, with persuasion and culture as independent variables and the four aforementioned control variables as covariates. Using Pillai's trace, the multivariate testing showed a significant main effect of culture ($V = 0.07$, $F(3, 371) = 9.87$, $p < 0.001$, $\eta p^2 = 0.074$) and a significant effect of one covariate – the number of cigarettes smoked per day ($V = 0.07$, $F(3, 371) = 9.86$, $p < 0.001$, $\eta p^2 = 0.074$).

Univariate testing showed that the interactions between culture and persuasion did not reach significance on all the dependent variables (minimal $p = 0.383$, maximal $\eta p^2 = 0.005$). The change of craving for cigarettes and the real amount of cigarette intake were not included in the MANCOVA, because a number of participants did not respond to these two dependent variables. Out of 396 participants, only 267 who were assigned to self-persuasion and direct persuasion conditions reported on the craving item before and after the persuasion task. Only 319 participants out of 396 responded to the message asking real cigarette intake on the second day. Therefore, two ANCOVAs were conducted separately on these two dependent variables. The interaction between culture and persuasion was not significant on both change of craving ($p = 0.655$, $\eta p^2 = 0.001$) and real amount of cigarette intake ($p = 0.067$, $\eta p^2 = 0.018$).[7] Additional Bayesian analysis provided moderate evidence supporting excluding the interaction effect on attitude, risk perception, intention to limit smoking, and the change of craving: $BF10_{attitude} = 0.075$; $BF10_{risk\ perception} = 0.059$; $BF10_{intention} = 0.122$, $BF10_{change\ of\ craving} = 0.194$. Anecdotal evidence to exclude the interaction effect was obtained on the real smoking intake on the next day: $BF10_{cigarette\ smoked\ within\ 24h} = 0.650$.

The main effect of persuasion did not reach significance on any dependent variable (minimal $p = 0.142$, maximal $\eta p^2 = 0.009$). However, we consistently found a

Table 4: Mean scores and standard deviations on secondary variables of Study 4.

	SP & C (N = 71)	DP & C (N = 64)	No & C (N = 58)	SP & U (N = 68)	DP & U (N = 64)	No & U (N = 71)
Number of cigarettes smoked per day	10.63 ± 7.36	10.69 ± 9.49	8.98 ± 6.93(2)	13.10 ± 7.92(1)	12.54 ± 9.72(3)	11.97 ± 7.61
Number of cigarettes smoked on the day of the experiment	6.52 ± 5.10	7.95 ± 7.28	5.38 ± 6.42	5.26 ± 5.36	4.32 ± 4.84(1)	4.32 ± 3.51
Number of years smoked	11.16 ± 9.51(3)	10.84 ± 9.63	8.79 ± 7.88(1)	19.42 ± 10.63(2)	18.17 ± 11.90(1)	17.63 ± 10.02(1)
Education	2.96 ± 0.95	2.66 ± 0.88	2.90 ± 0.85	2.62 ± 0.77	2.48 ± 0.62	2.56 ± 0.69
Self-efficacy	4.34 ± 1.92	4.20 ± 1.79	4.55 ± 1.91	4.24 ± 1.60	4.50 ± 1.84	4.01 ± 1.64

Note: Education was reported on a 5-point scale: 1 = lower than high school; 2 = high school; 3 = bachelor; 4 = master; 5 = doctor. SP: self-persuasion, DP: direct persuasion, No: No persuasion, C: Chinese participants, U: U.S. participants. The number of missing values in each group is presented in brackets.

significant main effect of culture on the dependent variables. It was significant on attitude and risk perception, $F(1, 373) = 14.30$, $p < 0.001$, $\eta p^2 = 0.037$; $F(1, 373) = 5.78$, $p = 0.017$, $\eta p^2 = 0.015$: U.S. participants ($M_{attitude} = 40.01$, $SE_{attitude} = 0.59$) ($M_{riskperception} = 40.87$, $SE_{riskperception} = 0.92$) held a higher negative attitude and a higher risk perception towards smoking than Chinese participants ($M_{attitude} = 36.56$, $SE_{attitude} = 0.61$) ($M_{riskperception} = 37.46$, $SE_{riskperception} = 0.94$). Culture non-significantly trended on intention to limit smoking, $F(1, 373) = 3.56$, $p = 0.060$, $\eta p^2 = 0.009$: Chinese participants ($M = 15.58$, $SE = 0.35$) reported a higher intention to limit their cigarette intake than U.S. participants ($M = 14.58$, $SE = 0.34$). Culture also had a significant effect on the cigarette intake during the second day, $F(1, 297) = 6.68$, $p = 0.010$, $\eta p^2 = 0.022$: U.S. participants ($M = 12.40$, $SE = 0.51$) on average smoked 1.91 cigarettes more than Chinese participants during the 24 hours after the experiment ($M = 10.49$, $SE = 0.44$). The main effect of culture was not found on the change of craving for cigarettes ($p = 0.379$, $\eta p^2 = 0.003$).

Furthermore, U.S. participants perceived higher cognitive effort ($M = 27.37$, $SE = 0.48$) in the persuasion tasks, irrespective of direct persuasion or self-persuasion task, than Chinese participants ($M = 24.98$, $SE = 0.48$), $F(1, 263) = 12.49$, $p < 0.001$, $\eta p^2 = 0.045$.

The findings that U.S. participants reported more negative attitude, higher risk perception towards smoking, and higher cognitive effort in the tasks could possibly be explained by people's different views on how acceptable smoking behavior is in different cultures. By 2017, over half of the states in the U.S. have enacted bans on smoking in all enclosed workplaces, all bars, and restaurants, whereas China still lags behind in implementing tobacco control policies. The bans may form U.S. citizens' view that smoking is a highly-disapproved behavior, which is likely activated when encountering anti-smoking messages. To the contrary, as Pan (2004) stated, smoking serves an important social function for Chinese people to build connections, to show respect and hospitality, and to reinforce friendships or relationships. Since the link between smoking and negative views is more salient and emphasized in the U.S. culture, it is reasonable that U.S. participants were more responsive towards the tasks than Chinese participants. Interestingly, however, the behavioral index demonstrated a reversed pattern: U.S. participants smoked more cigarettes than Chinese participants did during the 24 hours after the experiment. This weak attitude-behavior link has been found several times in previous studies (e.g., Smith & Louis, 2009; Topa & Moriano, 2010).

With regard to the methodology, instead of measuring self-construal of participants from Western cultures, Study 4 selected participants from two prototypical interdependent and independent cultures. Consequently, we found the expected differences in self-construal between the two cultures. However, results did not support the moderating role of the chronic self-construal. Furthermore, no differences were found among self-persuasion, direct persuasion, and the control group.

It is noteworthy to mention that divergent sampling procedures were used for recruiting the U.S. and Chinese

participants due to resource constraints. Although as expected in our sample, Chinese participants were more interdependent than the U.S. participants, there were many other differences between the two groups of participants. Future research should, therefore, take into account confounding factors that emerge from different sampling procedures.

Study 5

Given the notion that cultural differences should be to a large extent understood by the different representation of self (Markus & Kitayama, 1999; Trandis, 1989; Triandis, 1995), we used culture as a proxy for variation in self-construal in Study 4. However, it should be recognized that people from different cultures differ from each other in many ways, and self-construal only represents one of them (Cross et al., 2011). Culture, in this sense, is an umbrella concept which accounts for the specific differences in self-construal while cannot be regarded as the same concept as self-construal.

Though widely deemed as the product of culture, self-construal can also be determined by situations, and a number of priming tasks were developed to temporarily access certain aspects of self-construal (e.g., Brewer & Gardner, 1996; Gardner, Gabriel, & Lee, 1999; Holland, Roeder, van Baaren, Brandt, & Hannover, 2004). As researcher announced, 'This development allows researchers to move from reliance on culture as a proxy for self-construal or on explicit self-report measures to experimental manipulations of these constructs' (Cross et al., 2011, p. 150). Therefore, Study 5 manipulated self-construal (interdependence vs. independence) by priming participants with one of the two self-construal aspects to examine whether situational self-construal possibly has a different influence than chronic self-construal on (self-)persuasion and smoking. Study 5 was pre-registered on the Open Science Framework (https://osf.io/v4xaw/).

Method

Participants and design. A 2 (persuasion: self-persuasion vs. direct persuasion) × 2 (priming: independence vs. interdependence) between-subjects design was used, with the same dependent variables used in Study 4, and persuasion and priming as two independent variables.

A relatively small effect size $\eta p^2 = 0.03$ (Cohen et al., 2003) for the significant interaction between persuasion and primed self-construal was used in the prior power analysis, which indicated a minimum sample size of 256 ($\alpha = 0.05$, $1\text{-}\beta = 0.80$, $\eta p^2 = 0.03$). This study was programmed in Qualtrics in English and distributed via Prolific. In total, 692 responses were recorded. After excluding the participants whose data were not validated (for detailed exclusion criteria, see the pre-registration of this study), 283 participants (144 females, age ranging from 18 to 68, $M_{age} = 36.74$ years, $SD_{age} = 11.28$, with one missing value on age and gender) were included in the final analysis. None of these participants participated in previous studies. Each participant was paid 2 pounds as compensation.

Procedure and materials. First, participants were randomly assigned by the Qualtrics randomizer into one of the two priming conditions. In the independent priming

condition, participants were given three minutes to think about and write down their differences from the members in their communities and society, and what they expect themselves to do to achieve their uniqueness. In the interdependent priming condition, participants were given three minutes to think about and write down their similarities with the members in their communities and society, and what they are expected to do as a member of the society (adapted from Trafimow, Triandis, & Goto, 1991). Subsequently, participants were again randomly assigned by the Qualtrics randomizer into either the self-persuasion or direct persuasion condition. They were presented one of the two videos that were used in Study 3.

The same dependent variables were measured as in Study 4, namely, attitude, risk perception, intention to limit smoking,[8] the change of craving for cigarettes, and the number of cigarettes consumed during 24 hours after the experiment. After data collection was completed, all participants were debriefed and compensated.

Results and Discussion
First, five ANOVAs were done with persuasion and self-construal priming as two independent variables as randomization checks (**Table 5**). A significant main effect of persuasion ($p = 0.019$, $\eta p^2 = 0.019$) and an interaction effect ($p = 0.031$, $\eta p^2 = 0.017$) were found significant on education. The main effect of persuasion was also found significant on the number of cigarettes smoked per day ($p = 0.038$, $\eta p^2 = 0.016$), and on the number of cigarettes smoked on the day of the experiment ($p = 0.048$, $\eta p^2 = 0.014$). Therefore, these three variables were controlled for in later analyses.

To test whether primed self-construal moderates the effect of persuasion on attitude, risk perception, intention to limit smoking, and change of craving, a MANCOVA was conducted with persuasion and primed self-construal as independent variables, and the three aforementioned control variables as covariates. Using Pillai's trace, the multivariate testing showed a significant effect of education ($V = 0.04$, $F(4, 262) = 2.46$, $p = 0.046$, $\eta p^2 = 0.036$) and a significant effect of the number of cigarettes smoked per day ($V = 0.06$, $F(4, 262) = 4.24$, $p = 0.002$, $\eta p^2 = 0.061$). Univariate testing found no significant main effects or interaction effect on the four dependent variables (minimal $p = 0.137$, maximal $\eta p^2 = 0.008$).

A separate ANCOVA was conducted with the same independent variables and covariates on participants' self-reported cigarette intake during the day after the experiment (N = 240). No significant main effects or interaction were found (minimal $p = 0.117$, maximal $\eta p^2 = 0.011$).[9] Additional Bayesian analysis also anecdotally or moderately supported excluding the interaction effect, $BF10_{attitude} = 0.528$; $BF10_{risk\ perception} = 0.351$; $BF10_{intention} = 0.189$, $BF10_{change\ of\ craving} = 0.239$, $BF10_{cigarette\ smoked\ within\ 24h} = 0.366$. An ANOVA was done on cognitive effort with persuasion and priming as independent variables. Neither the main effects nor the interaction effect was significant (minimal $p = 0.388$, maximal $\eta p^2 = 0.003$), indicating participants in the four conditions exerted the same amount of cognitive effort.

Results from Study 5 suggest that similarly to chronic self-construal, situational self-construal does not moderate the effect of (self-) persuasion on smoking-related outcomes. It should be mention that no manipulation check was conducted after the self-construal priming task due to the concern that otherwise the priming effect might fade away. Although we selected the most effective priming task 'Similarities and Differences between Families and Friends (SSDF, with a d = 0.44, see Oyserman & Lee, 2008) and handled strict criteria for excluding participants who failed in writing about their similarities and differences with/from social others, we cannot rule out the possibility that the task did not successfully prime situational self-construal. This could be a possible reason for the null-results.

General Discussion
Persuasion has been extensively researched in recent decades, and self-persuasion has been declared to be more effective in attitude and behavioral change (e.g., Aronson, 1999; Glock, et al., 2013). Nevertheless, little attention has been paid to the potential moderation effect of self-construal. With five studies, we examined this proposed moderation effect on (self-) persuasion in relation to smoking-related outcomes. In the first study, an unexpected interaction between persuasion and self-construal was found on attitude and risk perception towards smoking. Bayesian statistics provided moderate and anecdotal evidence for including this moderation effect on these

Table 5: Mean scores and standard deviations on secondary variables of Study 5.

	DP & IN (N = 77)	DP & INTER (N = 70)	SP & IN (N = 69)	SP & INTER (N = 67)
Number of cigarettes smoked per day	13.49 ± 9.77(2)	13.26 ± 7.82(2)	11.20 ± 6.90(3)	11.45 ± 7.66(1)
Number of cigarettes smoked on the day of the experiment	6.13 ± 7.05(1)	6.94 ± 7.41(1)	4.42 ± 3.62(2)	5.63 ± 6.53
Number of years smoked	18.81 ± 12.17(2)	18.38 ± 11.00(2)	15.52 ± 11.31(5)	17.89 ± 11.56(1)
Education	2.55 ± 0.72(1)	2.47 ± 0.61	2.54 ± 0.76	2.87 ± 0.83
Self-efficacy	4.42 ± 1.70	4.44 ± 1.66	4.57 ± 1.85	4.36 ± 1.57

Note: Education was reported on a 5-point scale: 1 = lower than high school; 2 = high school; 3 = bachelor; 4 = master; 5 = doctor. SP: self-persuasion, DP: direct persuasion, IN: Priming Independence, INTER: Priming Interdependence. The number of missing values in each group is presented in brackets.

two dependent variables. It should be mentioned here that Study 1 was likely underpowered due to its exploratory nature and the resource constraint of recruiting sufficient participants. Therefore, we conducted four follow-up studies to examine whether the observed effect was found by chance and to further investigate the proposed moderation effect. The following experiments, which used different ways to access self-construal and to manipulate persuasion, consistently found that the proposed moderation effect was not significant, and these null results were supported by Bayesian statistics, moderately or anecdotally.

It is important to mention that the current research implemented several important aspects to improve generalizability. Previous research that studied persuasion and smoking-related outcomes was oftentimes conducted in a laboratory setting and used small sample sizes with college students as participants (e.g., Glock et al., 2013; Müller et al., 2016; Müller, van Someren, Gloudemans, van Leeuwen, & Greifeneder, 2017). The current research was conducted online with 1063 daily smokers in total, aged from 18 to 73. This diverse population helps to generalize the research outcomes to a larger group rather than college students only. Methodologically, a variety of methods was applied to assess self-construal. We examined self-construal chronically, in different cultures and situationally, thus providing a comprehensive understanding of its role in the proposed model. Moreover, different dependent variables were measured to access participants' responses to smoking, including self-reports of actual smoking behavior.

The current research provides social influence researchers with insights that the effect of persuasion on smoking-related outcomes is to a large extent not regulated by self-construal when the source of persuasive messages differs. Notably, our research challenges the idea of the self-persuasion effect on smoking-related outcomes within independent countries. Throughout five studies, we did not find a significant difference in most of the smoking-related dependent variables between self-persuasion and direct persuasion condition, with only one exception in Study 2 (on risk perception). It is possible that both messages were derogated, because nowadays smokers are exposed so frequently to anti-smoking persuasive messages (e.g., Schüz & Ferguson, 2014) that they become immune to such kind of messages. Even if not derogated, the self-generated reasons and the given arguments can be very similar to each other since smokers are so familiar with the negative consequences of smoking (Kneer et al., 2012). Furthermore, research has shown that people are less volitional to habit-driven behaviors, although sometimes the habits do harm to their life and health (Best & Papies, 2017). As highly addictive and habitual, daily smokers' smoking behavior can hardly be changed based only on exposure to the persuasive messages once. According to the Cognitive Dissonance Theory (Festinger, 1962), when smokers assume that they would not decrease their cigarettes consumption after perceiving the message, they would probably report corresponding cognitions towards smoking in order to keep it consistent with their subsequent action. This can happen independently of which

persuasion technique is used, which could lead to a non-significant main effect of persuasion.

Several limitations should be addressed. Firstly, some participants in the current research detected the study aim as influencing their attitude and behavior, which could undermine the impact of self-persuasion (e.g., Strack, Schwarz, Bless, Kübler, & Wänke, 1993; Williams, Fitzsimons, & Block, 2004). Previous research often manipulated self-persuasion in a subtle way or under a cover story so that participants could experience the information as their own thoughts and rely on these thoughts in arriving at a judgment (Müller et al., 2009; Müller et al., 2016). In our research, although the research goal was covered by the idea of understanding daily smokers' cognition towards smoking, the successive smoking-related measures right after persuasion tasks could make the link of persuasion and attitude change unavoidably suspicious. When looking into the suspicion probe in each study, several participants were able to detect that the research was about smoking intervention, although concrete hypotheses on the moderation effect of self-construal were not speculated. Secondly, a core element making self-persuasion effective is to raise the targets' hypocrisy (Aronson, 1999), which is normally diminished by practicing what they preached. In the online context, hypocrisy is more difficult to be raised since no social interaction and self-involvement are involved. This could have been solved by making participants' self-arguments published online via social media to increase their self-involvement in the task. Thirdly, health warnings were used as persuasive messages in Study 1, Study 3, and Study 5 in order to provide smokers with real-life information. However, ecological validity stays low as several warnings were presented sequentially, and each one was presented for a fixed time period of 15 seconds, making it not representative of how individuals view warning labels in real life. Lastly, no attention check was performed in the self-persuasion condition. Future research could consider creating such a task for checking participants' attention during the argument-generation process.

Furthermore, several statistical drawbacks need to be addressed. Firstly, as Albers and Lakens (2018) stated, power analyses based on pilot data are often biased, and follow-up bias could lead to underpowered studies. In the current research, power analyses of both Study 2 and Study 3 were conducted based on the effect size observed in former studies. In addition, for these two studies, no smallest effect size of interest (SESOI) was determined (see Lakens, 2014), due to the lack of knowledge of which effect sizes are meaningful and which are not. Taken as a whole, it is still pending whether the null results obtained reflected a real non-existent effect or whether the actual effect size is too small to be detected with the potentially biased sample size. Moreover, the evidence of null hypothesis by Bayesian statistics was mostly anecdotal and moderate – not strong enough to give an assertive conclusion. Therefore, we recommend the readers to interpret the current results with caution, and it could be helpful to calculate the equivalence bounds of the meta-analytical effect size with a mini-meta-analysis (Lakens, 2017). Secondly, baseline homogeneity was tested after randomization, and covariates were included

accordingly in the current research. However, it has been argued that this practice can be inappropriate (e.g., de Boer, Waterlander, Kuijper, Steenhuis, & Twisk, 2015; Gruijters, 2016). De Boer and colleagues (2015) recommended to extract the appropriate covariates from previous studies, make decisions before starting the experiment, and pre-register the planned covariates. Since previous studies had no consensus on the prognostic variables for the current research topic, we chose to pre-register and test all the potential covariates at baseline and use the ones which differed significantly between conditions as covariates. Nevertheless, future studies should pay more attention when selecting covariates and try to apply structural equation modeling (SEM)-based statistical approaches, which can make the measurement error associated with each factor an explicit part of the full model (for more information, see Westfall & Yarkoni, 2016). Lastly, the default prior was used to provide a reference point (Wagenmakers, 2018) for conducting Bayesian statistics, since there was no strong pre-data knowledge for us to anticipate the effect size. However, a better practice would have been to follow the WAMBS-Checklist (When to worry and how to Avoid the Misuse of Bayesian Statistics; for more information, please see Depaoli & van de Schoot, 2017).

To conclude, the current research initiates the investigation of (self)-persuasion in a cultural framework and found inconclusive evidence about the moderating role of self-construal. We think our preliminary results need to be replicated in future studies with more statistical power. In addition, it would be also interesting to examine the relationship between persuasion and self-construal in different domains (e.g., helping, consuming, exercising) to explore whether the results vary across different target behaviors. Other cultural factors, such as power distance and uncertainty avoidance, can be explored as well in order to learn more about how certain persuasion techniques work from a cultural perspective.

Notes

[1] This line of research acquired the ethical approval from the ethical committee of the Faculty of Social Sciences at Radboud University. The reference number of the approval is ECSW2016-0905-399.

[2] Cronbach's α of the Attitude and Risk Perception Scales in Study 2 are 0.71, 0.90 respectively.

[3] Without controlling the number of cigarettes smoked per day and the number of cigarettes smoked on the day of the experiment, the main effect of persuasion on risk perception became non-significant, $F(1, 64) = 2.66$, $p = 0.108$, $\eta p^2 = 0.040$. All the other main and interaction effects remained at the same significance level.

[4] For exploratory reasons, several other elements (i.e., power distance, inclusion of other in the self, psychological reactance) were tested in Study 3, Study 4, and Study 5. The results of these variables were omitted, as there were no differences between the experimental groups in all studies.

[5] Cronbach's α of the Attitude, Risk Perception, Intention to limit smoking Scales in Study 3 are 0.74, 0.88 and 0.96 respectively.

[6] Cronbach's α of the Attitude, Risk Perception, Intention to limit smoking Scales in Study 4 are 0.77, 0.92 and 0.91 respectively.

[7] Without including the covariates, the main effect of culture became significant on intention to limit smoking: $F(1, 390) = 17.14$, $p < 0.001$, $\eta p^2 = 0.042$; the interaction between culture and persuasion became significant on real amount of cigarette intake on the second day: $F(2, 313) = 3.65$, $p = 0.027$, $\eta p^2 = 0.023$. However, simple contrasts comparisons showed that the intervention effect (between self-persuasion, direct persuasion, and control group) was still not significant in both the Chinese sample (minimal $p = 0.233$) and the U.S. sample (minimal $p = 0.136$). All the other main and interaction effects remained at the same significance level.

[8] Cronbach's α of the Attitude, Risk Perception, Intention to limit smoking Scales in Study 5 are 0.77, 0.93 and 0.95 respectively.

[9] Without including the covariates, the main effect of persuasion became significant on the cigarette intake during the second day, $F(1, 236) = 6.26$, $p = 0.013$, $\eta p^2 = 0.026$. On average, participants in the direct persuasion condition consumed 2.40 more cigarettes than those in the self-persuasion condition. All the other main and interaction effects remained at the same significance level.

Competing Interests

The authors have no competing interests to declare.

References

Albers, C., & **Lakens, D.** (2018). When power analyses based on pilot data are biased: Inaccurate effect size estimators and follow-up bias. *Journal of Experimental Social Psychology*, *74*, 187–195. DOI: https://doi.org/10.1016/j.jesp.2017.09.004

Aronson, E. (1999). The power of self-persuasion. *American Psychologist*, *54*(11), 875–884. DOI: https://doi.org/10.1037/h0088188

Baldwin, A. S., Rothman, A. J., Vander Weg, M. W., & **Christensen, A. J.** (2013). Examining causal components and a mediating process underlying self-generated health arguments for exercise and smoking cessation. *Health Psychology*, *32*(12), 1209–1217. 10. DOI: https://doi.org/10.1037/a0029937

Baška, T., Warren, C. W., Bašková, M., & Jones, N. R. (2009). Prevalence of youth cigarette smoking and selected social factors in 25 European countries: findings from the Global Youth Tobacco Survey. *International Journal of Public Health, 54*(6), 439–445. DOI: https://doi.org/10.1007/s00038-009-0051-9

Bernritter, S. F., van Ooijen, I., & Müller, B. C. (2017). Self-persuasion as marketing technique: the role of consumers' involvement. *European Journal of Marketing, 51*(5/6), 1075–1090. DOI: https://doi.org/10.1108/EJM-04-2015-0213

Best, M., & Papies, E. K. (2017). Right here, right now: situated interventions to change consumer habits. *Journal of the Association for Consumer Research, 2*(3), 333–358. DOI: https://doi.org/10.1086/695443

Brewer, M. B., & Gardner, W. (1996). Who is this "we"? Levels of collective identity and self representations. *Journal of Personality and Social Psychology, 71*(1), 83–93. DOI: https://doi.org/10.1037/0022-3514.71.1.83

Campbell, D. T., & Stanley, J. C. (1963). Experimental and quasi-experimental designs for research. Chicago, IL: Rand-McNally.

Chen, Z., Peto, R., Zhou, M., Iona, A., Smith, M., Yang, L., & China Kadoorie Biobank (CKB) collaborative group, et al. (2015). Contrasting male and female trends in tobacco-attributed mortality in China: evidence from successive nationwide prospective cohort studies. *The Lancet, 386*(10002), 1447–1456. DOI: https://doi.org/10.1016/S0140-6736(15)00340-2

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). Applied multiple correlation/regression analysis for the behavioral sciences. UK: Taylor & Francis.

Cook, T. D., & Campbell, D. T. (1979). Quasi-experimentation: Design and analysis issues for field settings. Boston, MA: Houghton Mifflin Company.

Cross, S. E., Hardin, E. E., & Gercek-Swing, B. (2011). The what, how, why, and where of self-construal. *Personality and Social Psychology Review, 15*(2), 142–179. DOI: https://doi.org/10.1177/1088868310373752

Croyle, R. T., Sun, Y. C., & Louie, D. H. (1993). Psychological minimization of cholesterol test results: moderators of appraisal in college students and community residents. *Health Psychology, 12*(6), 503–507. DOI: https://doi.org/10.1037/0278-6133.12.6.503

Damen, T. G., Müller, B. C., van Baaren, R. B., & Dijksterhuis, A. (2015). Re-examining the agentic shift: the sense of agency influences the effectiveness of (Self) persuasion. *PloS one, 10*(6). DOI: https://doi.org/10.1371/journal.pone.0128635

Dawson, A. P., Cargo, M., Stewart, H., Chong, A., & Daniel, M. (2012). "I know it's bad for me and yet I do it": exploring the factors that perpetuate smoking in Aboriginal Health Workers-a qualitative study. *BMC Health Services Research, 12*(1), 102–114. DOI: https://doi.org/10.1186/1472-6963-12-102

Dean, K. K., & Gardner, W. L. (2014). How will "I" versus "we" perform? An investigation of future outlooks and self-construals. *Personality and Social Psychology Bulletin, 40*(8), 947–958. DOI: https://doi.org/10.1177/0146167214532137

de Boer, M. R., Waterlander, W. E., Kuijper, L. D., Steenhuis, I. H., & Twisk, J. W. (2015). Testing for baseline differences in randomized controlled trials: an unhealthy research behavior that is hard to eradicate. *International Journal of Behavioral Nutrition and Physical Activity, 12*, 4. DOI: https://doi.org/10.1186/s12966-015-0162-z

Depaoli, S., & van de Schoot, R. (2017). Improving transparency and replication in Bayesian statistics: The WAMBS-Checklist. *Psychological Methods, 22*(2), 240–261. DOI: https://doi.org/10.1037/met0000065

Erceg-Hurn, D. M., & Steed, L. G. (2011). Does exposure to cigarette health warnings elicit psychological reactance in smokers? *Journal of Applied Social Psychology, 41*(1), 219–237. DOI: https://doi.org/10.1111/j.1559-1816.2010.00710.x

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*(2), 175–191. DOI: https://doi.org/10.3758/BF03193146

Festinger, L. (1962). A Theory of Cognitive Dissonance. 2. Stanford, CA: Stanford University Press.

Gawronski, B. (2012). Back to the future of dissonance theory: Cognitive consistency as a core motive. *Social Cognition, 30*(6), 652–668. DOI: https://doi.org/10.1521/soco.2012.30.6.652

Gelfand, M. J., Erez, M., & Aycan, Z. (2007). Cross-cultural organizational behavior. *Annu. Rev. Psychol., 58*, 479–514. DOI: https://doi.org/10.1146/annurev.psych.58.110405.085559

Glock, S., & Kneer, J. (2009). Are deterrent pictures effective? The impact of warning labels on cognitive dissonance in smokers. *Applied Psychology: Health and Well Being, 1*(3), 356–373. DOI: https://doi.org/10.1111/j.1758-0854.2009.01019.x

Glock, S., Müller, B. C., & Ritter, S. M. (2013). Warning labels formulated as questions positively influence smoking-related risk perception. *Journal of health psychology, 18*(2), 252–262. DOI: https://doi.org/10.1177/1359105312439734

Glock, S., Unz, D., & Kovacs, C. (2012). Beyond fear appeals: Contradicting positive smoking outcome expectancies to influence smokers' implicit attitudes, perception, and behavior. *Addictive Behaviors, 37*(4), 548–551. DOI: https://doi.org/10.1016/j.addbeh.2011.11.032

Grandpre, J., Alvaro, E. M., Burgoon, M., Miller, C. H., & Hall, J. R. (2003). Adolescent reactance and anti-smoking campaigns: A theoretical approach. *Health Communication, 15*(3), 349–366. DOI: https://doi.org/10.1207/S15327027HC1503_6

Gruijters, S. L. (2016). Baseline comparisons and covariate fishing: Bad statistical habits we should have broken yesterday. *The European Health Psychologist, 18*(5), 205–209.

Gudykunst, W. B., Matsumoto, Y., Ting-Toomey, S., Nishida, T., Kim, K., & Heyman, S. (1996). The

influence of cultural individualism-collectivism, self construals, and individual values on communication styles across cultures. *Human communication research*, *22*(4), 510–543. DOI: https://doi.org/10.1111/j.1468-2958.1996.tb00377.x

Hannover, B., Birkner, N., & Pöhlmann, C. (2006). Ideal selves and self-esteem in people with independent or interdependent self-construal. *European Journal of Social Psychology*, *36*(1), 119–133. DOI: https://doi.org/10.1002/ejsp.289

Holland, R. W., Roeder, U., van Baaren, R. B., Brandt, A. C., & Hannover, B. (2004). Don't stand so close to me: The effects of self-construal on interpersonal closeness. *Psychological Science*, *15*(4), 237–242. DOI: https://doi.org/10.1111/j.0956-7976.2004.00658.x

Huijding, J., & de Jong, P. J. (2006). Automatic associations with the sensory aspects of smoking: Positive in habitual smokers but negative in non-smokers. *Addictive Behaviors*, *31*(1), 182–186. DOI: https://doi.org/10.1016/j.addbeh.2005.04.014

JASP Team. (2017). JASP (Version 0.8.4) [Computer software]. Retrieved from: https://jasp-stats.org/download/.

Keer, M., van den Putte, B., Neijens, P., & de Wit, J. (2013). The influence of affective and cognitive arguments on message judgement and attitude change: The moderating effects of meta-bases and structural bases. *Psychology & Health*, *28*(8), 895–908. DOI: https://doi.org/10.1080/08870446.2013.764428

Kneer, J., Glock, S., & Rieger, D. (2012). Fast and Not Furious?: Reduction of Cognitive Dissonance in Smokers. *Social Psychology*, *43*(2), 81–91. DOI: https://doi.org/10.1027/1864-9335/a000086

Kok, G., Peters, G. J. Y., Kessels, L. T., Ten Hoor, G. A., & Ruiter, R. A. (2018). Ignoring Theory and Misinterpreting Evidence: The False Belief in Fear Appeals. *Health Psychology Review*, *12*(2), 111–125. DOI: https://doi.org/10.1080/17437199.2017.1415767

Koplan, J., & Eriksen, M. (2015). Smoking cessation for Chinese men and prevention for women. *The Lancet*, *386*(10002), 1422–1423. DOI: https://doi.org/10.1016/S0140-6736(15)00416-X

Krischler, M., & Glock, S. (2015). Alcohol warning labels formulated as questions change alcohol-related outcome expectancies: A pilot study. *Addiction Research & Theory*, *23*(4), 343–349. DOI: https://doi.org/10.3109/16066359.2015.1009829

Kühnen, U., Hannover, B., & Schubert, B. (2001). The semantic–procedural interface model of the self: The role of self-knowledge for context-dependent versus context-independent modes of thinking. *Journal of personality and social psychology*, *80*(3), 397–409. DOI: https://doi.org/10.1037//0022-3514.80.3.397

Lakens, D. (2014). Performing high-powered studies efficiently with sequential analyses: Sequential analyses. *European Journal of Social Psychology*, *44*(7), 701–710. DOI: https://doi.org/10.1002/ejsp.2023

Lakens, D. (2017). Equivalence tests: a practical primer for t tests, correlations, and meta-analyses. *Social Psychological and Personality Science*, *8*(4), 355–362. DOI: https://doi.org/10.1177/1948550617697177

Liu, I. M. (1986). Chinese cognition. In: Bond, M. H. (ed.), *The psychology of the Chinese people*, 73–105. New York, NY, US: Oxford University Press.

Loman, J. G. B., Müller, B. C. N., Oude Groote Beverborg, A., van Baaren, R. B., & Buijzen, M. A. (2018). Self-persuasion in media messages: Reducing alcohol consumption among students with open-ended questions. *Journal of Experimental Psychology: Applied*, *24*(1), 81–91. DOI: https://doi.org/10.1037/xap0000162

Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, *98*(2), 224–253. DOI: https://doi.org/10.1037/0033-295X.98.2.224

Morris, M. W., & Peng, K. (1994). Culture and cause: American and Chinese attributions for social and physical events. *Journal of Personality and Social psychology*, *67*(6), 949–971. DOI: https://doi.org/10.1037//0022-3514.67.6.949

Müller, B. C. N., Ritter, S. M., Glock, S., Dijksterhuis, A., Engels, R. C. M. E., & van Baaren, R. B. (2016). Smoking-related warning messages formulated as questions positively influence short-term smoking behavior. *Journal of Health Psychology*, *21*(1), 60–68. DOI: https://doi.org/10.1177/1359105314522083

Müller, B. C. N., van Baaren, R. B., Ritter, S. M., Woud, M. L., Bergmann, H., Harakeh, Z., Engels, R. C. M. E., & Dijksterhuis, A. (2009). Tell me why… The influence of self-involvement on short term smoking behavior. *Addictive Behaviors*, *34*(5), 427–431. DOI: https://doi.org/10.1016/j.addbeh.2008.12.016

Müller, B. C. N., van Someren, D. H., Gloudemans, R. T. M., van Leeuwen, M. L., & Greifeneder, R. (2017). Helping made easy: Ease of argument generation enhances intentions to help. *Social Psychology*, *48*, 113–121. DOI: https://doi.org/10.1027/1864-9335/a000293

Oyserman, D., & Lee, S. W. (2008). Does culture influence what and how we think? Effects of priming individualism and collectivism. *Psychological Bulletin*, *134*(2), 311–342. DOI: https://doi.org/10.1037/0033-2909.134.2.311

Pan, Z. (2004). Socioeconomic predictors of smoking and smoking frequency in urban China: evidence of smoking as a social function. *Health Promotion International*, *19*(3), 309–315. DOI: https://doi.org/10.1093/heapro/dah304

Peters, G. J. Y., Ruiter, R. A. C., & Kok, G. (2013). Threatening communication: a critical re-analysis and a revised meta-analytic test of fear appeal theory. *Health Psychology Reviews*, *7*(sup1), S8–S31. DOI: https://doi.org/10.1080/17437199.2012.703527

Petty, R. E., Harkins, S. G., Williams, K. D., & Latane, B. (1977). The effects of group size on cognitive effort

and evaluation. *Personality and Social Psychology Bulletin*, *3*(4), 579–582. DOI: https://doi.org/10.1177/014616727700300406

Reitsma, M. B., Fullman, N., Ng, M., Salama, J. S., Abajobir, A., Abate, K. H., Adebiyi, A. O., et al. (2017). Smoking prevalence and attributable disease burden in 195 countries and territories, 1990–2015: a systematic analysis from the Global Burden of Disease Study 2015. *The Lancet*, *389*(10082), 1885–1906. DOI: https://doi.org/10.1016/S0140-6736(17)30819-X

Riemer, H., Shavitt, S., Koo, M., & Markus, H. R. (2014). Preferences don't have to be personal: Expanding attitude theorizing with a cross-cultural perspective. *Psychological Review*, *121*(4), 619–648. DOI: https://doi.org/10.1037/a0037666

Ruiter, R. A., & Kok, G. (2005). Saying is not (always) doing: cigarette warning labels are useless. *The European Journal of Public Health*, *15*(3), 329–329. DOI: https://doi.org/10.1093/eurpub/cki095

Schneider, S., Mohnen, S. M., & Pust, S. (2008). The average age of smoking onset in Germany—trends and correlates. *International Journal of Public Health*, *53*(3), 160–164.

Schüz, N., Eid, M., Schüz, B., & Ferguson, S. G. (2016). Immediate effects of plain packaging health warnings on quitting intention and potential mediators: Results from two ecological momentary assessment studies. *Psychology of Addictive Behaviors*, *30*(2), 220–228. DOI: https://doi.org/10.1037/adb0000146

Schüz, N., & Ferguson, S. G. (2014). Australian smokers' and nonsmokers' exposure to antismoking warnings in day-to-day life: a pilot study. *Nicotine & Tobacco Research*, *17*(7), 876–881. DOI: https://doi.org/10.1093/ntr/ntu253

Shaw, R. J., Pollak, K., Zullig, L. L., Bennett, G., Hawkins, K., & Lipkus, I. (2015). Feasibility and Smokers' Evaluation of Self-Generated Text Messages to Promote Quitting. *Nicotine & Tobacco Research*, *18*(5), 1206–1209. DOI: https://doi.org/10.1093/ntr/ntv268

Singelis, T. M. (1994). The measurement of independent and interdependent self-construals. *Personality and Social Psychology Bulletin*, *20*(5), 580–591. DOI: https://doi.org/10.1177/0146167294205014

Smith, J. R., & Louis, W. R. (2009). Group norms and the attitude-behavior relationship. *Social and Personality Psychology Compass*, *3*(1), 19–35. DOI: https://doi.org/10.1177/0146167296228002

Strack, F., Schwarz, N., Bless, H., Kübler, A., & Wänke, M. (1993). Awareness of the influence as a determinant of assimilation versus contrast. *European Journal of Social Psychology*, *23*, 53–62. DOI: https://doi.org/10.1002/ejsp.2420230105

Strahan, E. J., White, K., Fong, G. T., Fabrigar, L. R., Zanna, M. P., & Cameron, R. (2002). Enhancing the effectiveness of tobacco package warning labels: A social psychological perspective.

Tobacco control, *11*(3), 183–190. DOI: https://doi.org/10.1136/tc.11.3.183

Tan, D. (2012). *Smoking in Asia: A Looming Health Epidemic. Asian Scientist Magazine.* Retrieved from: http://www.asianscientist.com/2012/08/features/smoking-in-asia-looming-health-epidemic-2012/.

Topa, G., & Moriano, J. A. (2010). Theory of planned behavior and smoking: Meta-analysis and SEM model. *Substance Abuse and Rehabilitation*, *1*, 23–33. DOI: https://doi.org/10.2147/SAR.S15168

Trafimow, D., Triandis, H., & Goto, S. (1991). Some tests of the distinction between the private self and the collective self. *Journal of Personality and Social Psychology*, *60*(5), 649–655. DOI: https://doi.org/10.1037/0022-3514.60.5.649

Triandis, H. C. (1989). The self and social behavior in differing cultural contexts. *Psychological Review*, *96*(3), 506–520. DOI: https://doi.org/10.1037//0033-295X.96.3.506

Triandis, H. C. (1995). Individualism and collectivism. Boulder, CO: Westview Press.

van Baaren, R. B., Maddux, W. W., Chartrand, T. L., de Bouter, C., & van Knippenberg, A. (2003). It takes two to mimic: Behavioral consequences of self-construals. *Journal of Personality and Social Psychology*, *84*(5), 1093–1102. DOI: https://doi.org/10.1037/0022-3514.84.5.1093

Wagenmakers, E. J. (2018, May 3). Re: Reviewer wants justification for the default prior [Online forum comment]. Retrieved from: https://forum.cogsci.nl/discussion/4092/reviewer-wants-justification-for-the-default-prior.

Weisz, J. R., Rothbaum, E. M., & Blackburn, T. C. (1984). Standing out and standing in: The psychology of control in America and Japan. *American Psychologist*, *39*(9), 955–969. DOI: https://doi.org/10.1037/0003-066X.39.9.955

Westfall, J., & Yarkoni, T. (2016). Statistically controlling for confounding constructs is harder than you think. *PloS one*, *11*(3), e0152719. DOI: https://doi.org/10.1371/journal.pone.0152719

Williams, P., Fitzsimons, G. J., & Block, L. G. (2004). When consumers don't recognize "benign" intentions questions as persuasion attempts. *Journal of Consumer Research*, *31*, 540–550. DOI: https://doi.org/10.1086/425088

Wolburg, J. M. (2006). College students' responses to antismoking messages: Denial, defiance, and other boomerang effects. *Journal of Consumer Affairs*, *40*(2), 294–323. DOI: https://doi.org/10.1111/j.1745-6606.2006.00059.x

World Health Organization (WHO). (2015). *World No Tobacco Day 2015: Stop illicit trade of tobacco products.* Retrieved from: http://www.who.int/campaigns/no-tobacco-day/2015/event/en/.

Yuki, M., Maddux, W. W., Brewer, M. B., & Takemura, K. (2005). Cross-cultural differences in relationship-and group-based trust. *Personality and Social*

Psychology Bulletin, 31(1), 48–62. DOI: https://doi.org/10.1177/0146167204271305

Zhao, X., Peterson, E. B., Kim, W., & **Rolfe-Redding, J.** (2014). Effects of self-affirmation on daily versus occasional smokers' responses to graphic warning labels. *Communication Research, 41*(8), 1137–1158. DOI: https://doi.org/10.1177/0093650212465433

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