This is [not] who I am : understanding identity in continued smoking and smoking cessation
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CHAPTER | 4

STRENGTHENING QUITTER SELF-IDENTITY: AN EXPERIMENTAL STUDY

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ABSTRACT

Objectives

Identity is important for smoking and quitting smoking. We examined whether quitter self-identity (i.e., identification with quitting smoking as a behavior) could be strengthened experimentally through a writing exercise. In addition, we examined whether expected social support for quitting, manipulated through experimental vignettes, could facilitate identification with quitting.

Design

Participants (*N* = 339 daily smokers) were randomly assigned to a 2 (identity: strengthened quitter self-identity vs. control) x 3 (social support: present vs. absent vs. neutral control) between-participants design.

Main Outcome Measures

The main outcome was post-test quitter self-identity.

Results

Post-test quitter self-identity appeared to be stronger among participants in the experimental condition, with the effect being marginally significant. The social support manipulation did not facilitate identification with quitting. Secondary content analyses showed that quitter self-identity was strengthened more among participants who linked quitting smoking to their lifestyle, wanted to become a quitter for health reasons, and whose reasons for becoming a quitter included approach of positive aspects of quitting, but not among participants who linked quitter self-identity to their self-perception.

Conclusions

Results provide insight into the content of smokers' self-conceptualizations as quitters and suggest that writing exercises are a potentially useful method to strengthen quitter identities.

Keywords: smoking; identity; future selves; social support; writing exercise; vignettes.

People are motivated to act in line with their identity. According to PRIME theory, when people strongly identify with a behavior as being part of the "self", this is an important source of behavior (West, 2006). In addition to identification with behaviors, people may base self-perceptions on group memberships (Tajfel & Turner, 1979, 1986; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). Next to views of the self in the present (current selves), people form representations of who they might become (Markus & Nurius, 1986). These future self-conceptions may include views of ideal (wished for) and feared selves. Future selves are likely to mobilize behavior that helps to achieve ideal selves and avoid feared selves. People are motivated to engage in behavior that will lead them to become their ideal future self, and to avoid behavior that will lead them to become their feared future self (Barreto & Frazier, 2012; Oyserman & James, 2011). Future selves may also shape the evaluation of a current identity, such that a current identity as a smoker may be evaluated more negatively in the light of, for instance, a feared future self as an ill continuing smoker than with reference to an ideal future self as an occasional smoker without health problems (Markus & Nurius, 1986).

Identity also plays an important role in smoking cessation. Cross-sectional and prospective quantitative research has shown that smokers with stronger quitter self-identities and nonsmoker self- and group-identities are more likely to (intend to) quit, while smokers with stronger smoker self-identities are less likely to quit (Meijer et al., 2017; Høie, Moan, Rise, 2010; Meijer, Gebhardt, Dijkstra, Willemsen, & Van Laar, 2015; Meijer, Gebhardt, Van Laar, Kawous, Beijk, 2016; Moan & Rise, 2005; Moan & Rise, 2006; Tombor, Shahab, Brown, & West, 2013; Tombor, Shabab, Brown, Notley, & West, 2015; Van den Putte, Yzer, Willemsen, & De Bruijn, 2009). In addition, qualitative work has shown that smoking may become increasingly less central to the way ex-smokers perceive themselves following a successful quit attempt (Brown, 1996; Luck & Beagan, 2015; Shadel, Mermelstein, & Borrelli, 1996; Vangeli & West, 2012). Evidence suggests that identification with nonsmoking or quitting (future self) may be more important for smoking cessation than identification with smoking (current self) (Meijer et al., 2015; 2016; 2017). Furthermore, quitter identity may play a central role in the initial process of quitting smoking, as it can be a 'transitional identity' that helps smokers to become nonsmokers (Vangeli & West, 2012).

Identity may be enhanced by social support, such that receiving social support may enable people to develop new identities (e.g., Amiot, Terry, Wirawan, & Grice, 2010; Gleibs, Haslam, Haslam, & Jones, 2011; Van Laar, Bleeker, Ellemers, & Meijer, 2014; Van Laar, Bleeker, & Ellemers, 2017; Walsh et al., 2015). For example, a qualitative study among ex-smokers suggested that 'a supportive family environment was most contributory to redefining smoking and the self as a nonsmoker' (Brown, 1996, p. 419). Similarly, the social identity model of cessation maintenance (SIMCM: Frings & Albery, 2015) and the social identity model of recovery (SIMOR; Best et al., 2015) propose that the social

environment plays a central role in facilitating identity change in the process of recovery from addiction. For example, SIMCM states that people who recover from addiction identify more easily with recovery (i.e., self-perception as someone in recovery) when their social environment supports their recovery, is a source of self-esteem and self-efficacy, and increases the accessibility of the recovery identity. These findings suggest that, in the context of smoking cessation, identification with quitting and nonsmoking is easier when the quit attempt is supported by the social environment.

Current Study

The current experimental study among daily smokers aimed to strengthen quitter self-identity (i.e., identity as someone who quits smoking), as well as expected social support for quitting (i.e., positive, negative and practical support) as a potential facilitating factor of identification with quitting. Consistent with evidence suggesting that future selves are particularly important (Meijer et al., 2015; 2017), and that (temporary) identification with quitting may facilitate the transition from being a smoker to becoming a nonsmoker (Vangeli & West, 2012), we manipulated quitter self-identity rather than nonsmoker or smoker self-identity.

To our knowledge, no studies manipulating identities relevant to quitting have been published. Research on strengthening possible selves more generally suggests that writing exercises are a promising tool to strengthen quitter identities. Aspects of identity (e.g., related to physical exercise) can be enhanced through simple interventions such as imagining and writing about relevant possible selves, and these identities subsequently affect motivation, behavior and well-being (King, 2001; Layous, Nelson, & Lyuobomirksy, 2013; Murru & Martin Ginis, 2010; Ouellette, Hessling, Gibbons, Reis-Bergan, & Gerrard, 2005; Oyserman, Destin, & Novin, 2015). Moreover, imagining oneself as quitting smoking has been found to increase quit-intentions (Rennie, Herris, & Webb, 2014). Analysis of responses to such interventions is valuable, because the (types of) words that people use convey information about their thoughts, emotions and motivations, and can predict (health) outcomes (e.g., Pennebaker, Mayne, & Francis, 1997; Tausczik & Pennebaker, 2010).

The current study aimed to strengthen quitter self-identity by asking participants in the experimental condition to imagine and write about themselves as someone who is in the process of quitting smoking (experimental/control). Expected support for quitting was subsequently manipulated through vignettes (Marigold, Cavallo, Holmes, & Wood, 2014; Mojaverian & Kim, 2012) describing that participants would (social support present) or would not (social support absent) receive support. The type of support (i.e., positive, negative or practical) was tailored to participants' individual preferences, given that people have individual preferences for the type of support that they find helpful (High & Solomon, 2014; Meijer et al., 2016), and that support which matches these pref-

erences may be more helpful (Rafaeli & Gleason, 2009). Those in the control condition read no support vignette. We hypothesized that post-test quitter self-identity would be stronger in the experimental condition than in the control condition of the quitter self-identity manipulation (H1). Moreover, we hypothesized that post-test expected support for quitting would be stronger in the support present condition than in the support absent condition of the social support manipulation (H2). In addition, corresponding with research showing that identity may be facilitated by social support, we expected combined effects of the quitter self-identity (experimental) and social support (present) manipulations (H3). Furthermore, we analyzed the content of written responses to the manipulations to examine how smokers responded when they pictured themselves as quitters and imagined presence of absence of social support. Finally, we analyzed which written responses were associated with strengthened quitter self-identity compared to pre-test levels.

METHOD

Participants

Participants were recruited in the Netherlands from April-September 2014 for a study about smokers' experiences with smoking through a national newspaper (n = 74), previous research participation (n = 68), the researchers' social networks or other participants (n = 47), social media such as Facebook (n = 46), face-to-face recruitment at train stations (n = 25) and at a college of higher education (n = 21), and through other media (e.g., website about smoking for the general public www.rokeninfo.nl, n = 58). Participants who smoked daily at recruitment and were 18 years or older were eligible for participation in a four-wave longitudinal design. Participants who completed at least the pre-test and post-test measure (the first session) were included in the analyses. In total, 552 people met inclusion criteria and started the survey, of whom 339 completed the pre-test and post-test questionnaire (61%; N = 339, $n_{lower\ SES}$ = 63, $n_{middle\ SES}$ = 108, $n_{higher\ SES}$ = 168; n_{female} = 217). On average participants were 44.85 years old (SD = 17.39), smoked 15.71 cigarettes daily (SD = 8.16), and had been smoking for 26.75 years (SD = 17.37). Three gift coupons of € 100.- and six of € 50.- were distributed through a raffle.

Design and Procedure

Participants were randomly assigned to a 2 (identity: strengthened quitter self-identity vs. control) x 3 (social support: present vs. absent vs. control) between-participants design. The study was part of a prospective study with four waves divided over three sessions: a pre-test, which was directly followed by the experimental manipulations of quitter self-identity and social support, and a post-test immediately after the manipula-

tions; and 1-month and 6-month follow-ups. The current paper reports on the pre-test, manipulations and post-test (see Meijer et al., 2016 for pre-test findings). The procedure was approved by the University's Ethical Board. We piloted the pre-test and post-test survey by means of a think aloud procedure and adapted the surveys accordingly.

The survey was presented to participants using Qualtrics (www.qualtrics.com). At pre-test, relevant control variables were measured. Participants were also asked to indicate the particular types of social support for quitting smoking they would most desire from the people who are important to them (see below). Quitter self-identity (vs. control) was then manipulated, followed by the social support manipulation (social support present vs. absent vs. control). The manipulations of quitter self-identity and social support were followed by manipulation checks for social support, and measures of post-test quitter self-identity and expected social support. Taken together, completion of the pre-test, experimental manipulations, and post-test measurement took on average 50 minutes.

Quitter self-identity manipulation.
Participants in the strengthening quitter self-identity condition were asked to imagine being in the process of quitting smoking and to write down (through structured questions) all positive aspects that they thought about when thinking of themselves as a quitter. Next, participants were asked to write down the most important of these positive aspects. Similarly, participants in the control condition were asked to imagine washing their hands more often, to write down all positive aspects they thought about when thinking of themselves as washing their hands more often, and to write down the most important aspect of these (see Appendix A for the full text of the manipulation).

Social support manipulation.
The social support manipulation was constructed to match each participant's need for particular types of social support. As part of this procedure, participants selected at pre-test which three types, from twenty pre-described types of social support for quitting smoking, they would most desire from the people important to them (see Meijer et al., 2016 for frequencies). The items were based on the Partner Interaction Questionnaire (Cohen & Lichtenstein, 1990). A principal component analysis showed three components in the data, reflecting positive support (e.g., 'Compliment me on not smoking'), negative support (e.g., 'Criticize my smoking if I would smoke'), and a third practical support factor (e.g., 'Participate in an activity that keeps me from smoking'; see also Meijer et al., 2016). During the manipulation participants in the support present (absent) condition were presented with a tailored vignette describing that they would often (almost never) receive their three desired types of social support if they were in the process of quitting smoking. Participants in the social support control condition read a short story about the heart and blood circulation that did not involve social support. Participants in all

conditions were then asked to write about how they would feel in the situation and how it would affect them (see Appendix B for the full text of the manipulation).

Measures

The variables were measured in the order described below, except that post-test quitter self-identity was measured after the social support manipulation checks and expected support.

Pre-test.
<u>Background variables.</u>

<u>Demographics.</u>
We asked participants' gender, age, number of cigarettes smoked per day and number of years smoking.

   Quit-intention. Following Dijkstra, Bakker and De Vries (1997), participants were asked when (if at all) they intended to quit smoking: 'I intend to [1] 'quit within 1 month'; [2] 'quit within 6 months'; [3] 'quit within 2 years'; [4] 'quit within 5 years'; [5] 'quit within 10 years'; [6] 'quit sometime ever, but not within 10 years'; [7] 'always continue smoking, but less'; or [8] 'always continue smoking, and not less'. This variable was recoded such that higher scores indicated stronger quit-intention.

   Quitter self-identity. We measured quitter self-identity at pre-test with seven items. We based three items on the four-item Abstainer Self-Concept Scale (Shadel & Mermelstein, 1996) to measure quitter self-identity, that is, 'I am able to see myself as a quitter', 'Quitting smoking belongs with "who I am"', and 'I feel at ease with the idea of being a quitter'. We adapted three items from the Smoker Self-Concept Scale (Shadel & Mermelstein, 1996): 'Quitting is part of my personality (or can be part of my personality)', 'Quitting is a large part of my daily life (or can be a large part of my daily life)', and 'Others can picture me as a quitter', and added 'I would like to be a quitter' (adapted from Tombor et al., 2013). Answer categories ranged from [1] 'strongly disagree' to [5] 'strongly agree' (α = .86).

Post-test.
<u>Social support manipulation checks.</u>
Manipulation checks were measured among participants in the support present and absent conditions. To check whether participants read carefully, participants were asked what they had imagined [1] 'I received no support at all'- [7] 'I received much support'. Second, to examine whether participants successfully imagined the support situations, two items assessed *credibility of imagined social support*, that is, 'I can easily imagine the

situation' and 'I find the situation credible' (r = .65, p < .001), [1] 'not at all' to [7] 'very much'.

<u>*Outcome variables.*</u>
<u>*Quitter self-identity.*</u>
Two items measured post-test quitter self-identity, that is, 'Quitting smoking within 6 months fits with who I am' and 'Quitting smoking within 6 months fits with how I want to live', [1] 'strongly disagree'- [5] 'strongly agree' (adapted from Van den Putte et al., 2009), r = .52, p < .001. To prevent social desirability bias, different items were used compared to the pre-test.

<u>*Expected social support.*</u>
Expected support for quitting was assessed with three questions (α = .82), for example 'If I would attempt to quit smoking, people around me will strongly support me', [1] 'completely disagree' – [7] 'completely agree'.

RESULTS

We first conducted preliminary and main analyses to test the hypotheses, followed by secondary (qualitative) analyses of the written responses to the manipulations. We tested and found that assumptions of all analyses were met. We also tested for effects of the manipulations on post-test quit-intention, and changed smoking behavior and quit attempts at 1-month and 6-month follow-ups, but did not find such effects.

Attrition Analyses
We examined whether participants who completed the pre-test and post-test measures differed from those who did not, using one-way ANOVAs and Chi-square analyses. Attrition was not significantly related to the conditions of the identity manipulation (χ^2(1) = .51, p = .48, V = .04) nor the social support manipulation (χ^2(2) = 2.92, p = .23, V = .09), nor to gender and the number of cigarettes smoked daily. Participants were significantly more likely to drop out if they were younger and had been smoking for fewer years (see Appendix D).

Preliminary Analyses
One-way ANOVAs and Chi-square test were then used to test for pre-test differences between experimental conditions to examine effectiveness of random assignment (see Appendix E). The conditions did not differ on age, years smoked and number of cigarettes smoked per day, but we found marginally significant interactions between identity and support conditions on pre-test quitter self-identity and quit-intention. Ad-

ditional analyses of simple main effects showed that, within the support present condition, pre-test quitter self-identity ($F(1,318) = 6.18$, $p = .01$, $\eta_p^2 = .02$) and quit-intention ($F(1,318) = 4.28$, $p = .04$, $\eta_p^2 = .01$) were stronger in the strengthened quitter self-identity condition than in the control condition.

Fifteen participants did not comply with instructions for the identity manipulation and were excluded from the main analyses. Of these, nine participants explicitly denied quitter identity (see Secondary analyses), whereas others wrote question marks or 'not applicable'. Participants who did not comply were significantly older, had been smoking longer, and had weaker quitter self-identities at pre-test than other respondents (see Appendix F).

Quitter self-identity

Main analysis: Post-test quitter self-identity.
To examine whether the manipulations were successful, we performed an ANCOVA with the identity and support manipulations as independent factors, pre-test quitter self-identity as a covariate, and post-test quitter self-identity as dependent variable (see Table 1). A marginally significant effect of the quitter self-identity manipulation was found, such that participants in the strengthened quitter self-identity condition had stronger quitter self-identities at post-test than participants in the control condition (H1). Pre-test quitter self-identity was strongly and positively associated with post-test quitter self-identity ($b = .74$, $p < .001$, $\eta_p^2 = .42$). We found no significant differences in strength of post-test quitter self-identity between the conditions of the support manipulation and, in contrast to H3, no interaction between identity and support. In sum, means on post-test quitter self-identity were in the hypothesized direction, although the effect was marginally significant.

Secondary analyses: Analyses of written responses to the quitter self-identity manipulation.
We subsequently examined the content of written responses to the quitter self-identity manipulation and examined which responses were associated with increases in quitter self-identity. A coding scheme was developed to capture presence of relevant categories in the responses to the identity manipulation (see Appendix C). Cohen's Kappa values were calculated for interrater agreement on a random subset of 20% of cases. We evaluated the interrater agreement based on the criteria by Landis and Koch (1977), that is, a Kappa of .01-.20 indicates slight agreement, .21-.40 fair, .41-60 moderate, .61-.80 substantial, and .81-1.00 indicates (almost) perfect agreement. For dichotomous variables prevalence and bias indices were calculated, as these may effect (and explain) Kappa values. Interrater reliability of responses to the experimental condition of the quitter self-identity manipulation ranged from substantial to almost perfect for about two-thirds of the variables (see Table 2).

Table 1. Differences between experimental conditions on manipulation checks and outcome measures (post-test): Two-way AN(C)OVAs (N = 218-324).

Manipulation condition		Mean (Standard deviation)			
Social support	Identity	Quitter self-identity	Imagined social support[a]	Credibility of social support[a]	Expected social support[a]
Present	Quitter	3.57 (.77)	5.27 (1.58)	5.26 (1.18)	5.05 (1.25)
	Control	3.08 (.92)	5.32 (1.46)	5.13 (1.18)	5.29 (1.15)
	Total	3.28 (.89)	5.30 (1.50)	5.19 (1.15)	5.19 (1.19)
Absent	Quitter	3.17 (.91)	3.35 (1.82)	4.70 (1.47)	5.01 (1.11)
	Control	3.08 (.95)	2.94 (1.46)	4.58 (1.58)	4.80 (1.28)
	Total	3.12 (.93)	3.12 (1.63)	4.63 (1.53)	4.89 (1.21)
Control	Quitter	3.32 (.84)			5.44 (1.25)
	Control	3.30 (.92)			5.42 (1.22)
	Total	3.31 (.87)			5.43 (1.23)
Total	Quitter	3.34 (.85)	4.13 (1.88)	4.97 (1.34)	5.18 (1.22)
	Control	3.14 (.93)	4.27 (1.95)	4.86 (1.42)	5.15 (1.24)

Independent variable	ANCOVA[a]	ANOVAs		
	Quitter self-identity	Imagined social support[b]	Credibility of social support[b]	Expected social support
Identity condition	$F_{(1,317)} = 3.09, p = .08, \eta_p^2 = .01$	$F_{(1,214)} = .75, p = .39, \eta_p^2 < .01$	$F_{(1,214)} = .43, p = .51, \eta_p^2 < .01$	$F_{(1,318)} < .01, p = .97, \eta_p^2 < .01$
Support condition	$F_{(2,317)} = 1.12, p = .33, \eta_p^2 = .01$	$F_{(1,214)} = 100.04, p < .001, \eta_p^2 = .32$	$F_{(1,214)} = 8.98, p < .01, \eta_p^2 = .04$	$F_{(2,318)} = 4.94, p = .01, \eta_p^2 = .03$
Identity* support interaction	$F_{(2,317)} = .25, p = .78, \eta_p^2 < .01$	$F_{(1,214)} = 1.16, p = .28, \eta_p^2 = .01$	$F_{(1,214)} < .01, p = .98, \eta_p^2 < .01$	$F_{(2,318)} = .89, p = .41, \eta_p^2 = .01$

Notes. a. Pre-test quitter self-identity was included as a covariate. b. Participants in the control condition of the social support manipulation did not answer this question.

Content of responses to the identity manipulation.

Results showed that participants most often wanted to be quitters for health (84%), finances (56%), personal hygiene (35%) and physical condition reasons (30%; see Table 2). The majority of participants mentioned these reasons only with respect to the present (55%), and a substantial subgroup mentioned reasons relevant to the present as well as the future (22%). Moreover, half of participants mentioned reasons that were a combination of positive aspects of quitting (approach) and negative aspects of smoking (avoidance), although a substantial subgroup only mentioned approach reasons (30%). Emotions in relation to smoking and quitting were rarely mentioned. Those who did mention emotions wrote about negative smoking-related emotions (12%) or positive quitting-related emotions (7%). Almost half of participants (43%) made an explicit and positive link between quitting and their self-perception of the person they are (e.g., quitting fits with self-perception as being positive, determined, independent, brave etc.), and almost half of participants (48%) explicitly linked quitting to their lifestyle (e.g., having a healthy and conscious lifestyle). A small number of participants (9%) explicitly denied a quitter self-identity (e.g., 'I am not someone who quits smoking') or self-labelled as smoker (e.g., 'I am a smoker').

Responses and strengthened quitter self-identity.

We then performed hierarchical linear regression analyses among participants in the strengthened quitter self-identity condition to predict post-test quitter self-identity. Pre-test quitter self-identity was entered as a control variable in Step 1, and sets of related coded variables (see Table 2) were added as Step 2 in four separate regression models. Specifically, we added links between quitting and identity in Model 2A, emotions related to smoking and quitting in a separate Model 2B, reasons to become a quitter in a separate Model 2C, and motivation of reasons to become a quitter in terms of approach or avoidance in a separate model 2D. Each set of predictor variables (e.g., emotions) was therefore controlled for pre-test quitter self-identity, but not for other sets of predictors (e.g., reasons). Only categories that were coded as present in responses of at least 10% of participants and had sufficient interrater reliability (kappa ≥ .60) were used in the regression analyses.

   Results showed that those with stronger pre-test quitter self-identities had stronger quitter self-identities after the manipulation (see Table 3, Step 1). Above the effect of pre-test quitter self-identity, quitter self-identity was strengthened among participants who linked quitting smoking to their lifestyle (e.g., healthy), but not among participants who linked quitting smoking to their self-perception as a person (e.g., determined; Model 2A). Furthermore, no effects of smoking-related negative emotions were found (Model 2B). Quitter self-identity was strengthened among participants who wanted to become a quitter for health reasons (Model 2C), but other reasons for becoming a

Table 2. Frequencies and interrater reliability of codes for quitter self-identity (experimental condition, *N* = 165).

Category	Subcategory	Code	Frequency (%)	Interrater reliability		
				K	Prevalence	Bias
Reasons to become quitter	Content	Health	138 (83.6%)	.74***	.55	.09
		Finances	92 (55.8%)	.94***	.06	.03
		Personal hygiene	58 (35.2%)	1.00***	.38	.00
		Physical condition	50 (30.3%)	.90***	.61	.03
		Personal environment	32 (19.4%)	.87***	.72	.03
		Dependence	32 (19.4%)	.67***	.67	.03
		Own convenience	27 (16.4%)	.37**	.61	.21
		Example	20 (12.1%)	1.00***	.88	.00
		Social nuisance	20 (12.1%)	.71***	.61	.03
		Self-esteem	19 (11.5%)	.61***	.72	.03
		Social desirability	17 (10.3%)	.39*	.64	.06
		Social convenience	17 (10.3%)	.43*	.76	.00
		Time	12 (7.3%)	.47**	.88	.00
		Future motherhood[a]	3 (1.8%)			
		Outcast[a]	4 (2.4%)			
		Sleep[a]	1 (0.6%)			
		Sex[a]	1 (0.6%)			
	Temporal orientation	Present	91 (55.2%)	.52***		
		Present + future	37 (22.4%)			
		Unclear	36 (21.8%)			
		Future	1 (0.6%)			
	Approach/avoidance motivation	Approach and avoidance	82 (49.7%)	.72***		
		Approach	50 (30.3%)			
		Unclear	18 (10.9%)			
		Avoidance	15 (9.1%)			
Emotions related to smoking and quitting		Negative about smoking	20 (12.1%)	.87***	.73	.03
		Positive about quitting	11 (6.7%)	-.04	.91	.03
		Positive about smoking	3 (1.8%)	.65***	.91	.03
		Negative about quitting[a]	2 (1.2%)			
Links between quitting and identity		Link lifestyle	80 (48.5%)	.87***	.13	.06
		Link self-perception	71 (43.0%)	.63***	.06	.13
		Denial quitter identity[a]	14 (8.5%)			

* *p* < .05, ** *p* < .01, *** *p* < .001. κ = Cohen's kappa (calculated on data from the experimental condition)
a. Calculation of reliability was impossible because codes were absent in the random subset for reliability analysis for 1 or 2 raters.

quitter were not associated with strengthened identity. Finally, quitter self-identity was strengthened among participants whose reasons were approach-motivated, or both approach-motivated and avoidance-motivated (Model 2D). Quitter self-identity was not strengthened when reasons were only avoidance-motivated, that is, only reasons that included positive aspects of quitting were associated with strengthened quitter self-identity.

Table 3. Explaining post-test quitter self-identity by coding of written responses: Hierarchical linear regression analyses ($N = 165$).

		Predictor	b(SE)	β
Step 1		Pre-test quitter self-identity	.86 (.06)***	.74***
Model 2A		Link self-perception	-.02 (.10)	-.22
		Link lifestyle	.32 (.10)**	.17**
Model 2B		Smoking-related negative emotions	.12 (.15)	.04
Model 2C	Reasons to become quitter	Health	.28 (.14)*	.11*
		Finances	-.02 (.10)	-.01
		Personal hygiene	.11 (.12)	.06
		Physical condition	.12 (.11)	.06
		Personal environment	-.10 (.15)	-.04
		Dependence	.04 (.13)	.02
		Example	-.16 (.16)	-.06
		Social nuisance	.26 (.15)+	.09+
		Self-esteem	.10 (.16)	.03
Model 2D	Motivation of reasons	Avoidance[b]	.05 (.21)	.02
		Approach[b]	.38 (.17)*	.19*
		Avoidance and approach[b]	.41 (.16)*	.22*

Note. $R^2 = .55$ ($p < .001$) for Step 1; $\Delta R^2 = .03$ for Model 2A ($p = .01$); $\Delta R^2 = .00$ for Model 2B ($p = .45$); $\Delta R^2 = .03$ for Model 2C ($p = .28$); $\Delta R^2 = .03$ for Model 2D ($p = .03$);
+$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$.
a. Compared to reference category 'Unclear'.

Social Support

Main analyses.

Manipulation checks for social support.
Two 2-way ANOVAs were used to examine effects of the support manipulation (present/absent, not relevant for control) and identity (strengthened/control) on imagined support and credibility of support (see Table 1). Participants in the support present

condition imagined stronger support and rated the vignette as more credible than participants in the support absent condition. No effects of the identity manipulation and no interactions between support and identity on imagined support or credibility were found.

Furthermore, while 26 participants in the support absent condition scored above the scale midpoint (indicating high social support imagined), and 12 participants in the support present condition scored below the scale midpoint (indicating low support imagined), results for post-test quitter self-identity, credibility of support and expected social support were similar when these participants were excluded from the analyses.

Expected social support.

In contrast to H2, a two-way ANOVA showed that expected support was not strengthened successfully (see Table 1). Tukey post-hoc tests showed that expected support less strong in the support absent condition than in the control condition ($p < .32$), but no significant differences were found between support absent and present ($p = .17$), or the support present and control conditions ($p = .32$). No effects of the identity manipulation and no interaction effect on expected support were found.

Secondary analyses: Analyses of written responses to the social support manipulation.

We subsequently examined the content of responses to the social support manipulation, and found four different responses in each condition (i.e., positive, negative, positive and negative, neutral/unclear responses; see Table 4). The coding scheme to capture relevant categories in the responses to the social support manipulation was developed in the same way as was done for the identity manipulation (see Appendix C). Interrater reliability was almost perfect for responses to the support manipulation ($\kappa = .88$, $p < .001$). Surprisingly, although about two third of participants showed expected responses (i.e., negative response to absence of support and positive response to presence of support), 12% responded positively to absence of support (e.g., they did not want support), and 13% responded negatively to presence of support (e.g., support irritated them). Seven participants who showed such unexpected responses responded incorrectly on the imagined support scale, suggesting that they found it difficult to imagine the situation presented or did not read carefully. Moreover, 18% showed a mixed (positive and negative) response to support present, and 20% responded neutrally to support absent (e.g., it would not affect them). Finally, 10% responded negatively to the control condition (e.g., describing fear and stress in response to the story about blood circulation), but results were very similar when the analyses for post-test quitter self-identity, imagined support, credibility of support and expected support were repeated without these participants.

Table 4. Frequencies of responses to the social support manipulation.

Code	Frequency (%)		
	Support present	*Support absent*	*Control*
Positive response	70 (61.4%)	14 (12.2%)	72 (65.5%)
Negative response	15 (13.2%)	69 (60.0%)	11 (10.0%)
Mixed Response	20 (17.5%)	9 (7.8%)	5 (4.5%)
Neutral / unclear	9 (7.9%)	23 (20.0%)	22 (20.0%)

DISCUSSION

This experimental study was the first to examine whether quitter self-identity could be strengthened through a writing exercise, and whether identification with quitting could be enhanced by expected social support for quitting smoking. A minimal intervention showed marginally significant effects on post-test quitter self-identity, which appeared to be stronger among participants in the experimental condition. As such, although the effect was small, writing exercises may be a promising way to strengthen quitter self-identity (H1). The effect of the identity manipulation was not enhanced by social support (H3). Nine per cent of participants in the experimental condition did not comply with the instructions of the identity manipulation (e.g., denied quitter identity), suggesting that the approach likely does not benefit a small subgroup of smokers.

Participants' written responses to the experimental condition of the quitter self-identity manipulation showed that participants most often wanted to become quitters to improve their health, financial circumstances, personal hygiene or physical condition. Reasons often were a combination of approaching positive aspects of quitting and avoiding negative aspects of smoking. Moreover, about half of participants linked quitting to their lifestyle (e.g., healthy lifestyle), and another half to the person they perceived themselves to be (e.g., self-perception as independent). Strengthened quitter self-identity at post-test was associated with an explicit link between quitting and lifestyle, health reasons for becoming a quitter, and reasons including approach of positive aspects of quitting. Approach of positive aspects of quitting is likely to be closely associated with the (positive) future self as a quitter, whereas negative aspects of smoking are likely related to the (negative) current self as a smoker, and possibly therefore less relevant for strengthening quitter self-identity. Interestingly and unexpectedly, we did not find that quitter self-identity was strengthened among participants who made an explicit and positive link between quitting and their self-perceptions (e.g., quitting fits self-perceptions as independent) compared to those who did not link quitting to their self-perceptions as a person.

The reasons for becoming a quitter found in the current study (e.g., health) cor-respond with reasons for quitting smoking more generally (e.g., McCaul et al., 2006). Moreover, our findings correspond with previous studies showing that identity can be strengthened through writing exercises (King, 2001; Layous et al., 2013; Murru & Martin Ginis, 2010; Ouelette et al., 2005; Oyserman et al., 2015). We found that identity was strengthened among those who linked quitting to their lifestyle, but not among those who linked quitting to aspects of their self-perceptions, suggesting that identity might be strengthened indirectly through lifestyle. This corresponds with findings that changes in meaningful behaviors may enhance identification with nonsmoking, for example when ex-smokers replaced smoking by gardening (Luck & Beagan, 2015). In addition, possible selves have been strengthened successfully by having participants imagine their future life rather than directly imagine their future identity (King, 2001; Layous et al., 2013; Murru & Martin Ginis, 2010).

We were not successful in manipulating expected social support for quitting smoking, (H2), which prevented investigating whether expected support facilitated identification with quitting (H3). It is possible that participants at pre-test already might have had expectations of the social support that they would receive if they would quit, which were not much affected by the manipulation. Furthermore, whereas most participants responded as intended, a relatively large number of participants showed unintended responses (e.g., appreciation of absence of support), even though the received type of support was tailored to their preferences. Given that the vignettes were explicit about support, this can be explained by work showing that support can be unhelpful when the recipient is aware of receiving support (Bolger, Zuckerman, & Kesller, 2000). The authors suggest that being aware of receiving support may point attention toward the problem, or harm self-esteem because it makes people aware of their inability to solve problems independently. Support that is unnoticed or not interpreted as support (i.e., invisible support) may be more beneficial (Bolger et al., 2000).

This study has limitations. First, examination of effects of the manipulations was complicated by marginally significant pre-test differences in quitter self-identity and quit-intention, and by diverse responses to the control condition of social support. Second, the effect of the quitter self-identity manipulation was small and marginally significant, and the manipulation did not benefit a subset of participants. However, this lack of benefit for a subgroup may also be a true representation of likely effects. Third, the absence of certain content in the written responses (e.g., health reasons) does not necessarily mean that this content was irrelevant for participants. Importantly, however, those aspects that participants did write about are likely to be most salient to them, and therefore most important for the current study. Fourth, social desirability may have played a role, although the online nature of the study may have given participants a sense of anonymity that could decrease the desire for positive self-presentation. For

example, several participants indicated that they did not want to be a quitter or resisted complying with the instructions. Fifth, although previous work suggests that vignettes are a valid way to manipulate social support (Hainmueller, Hangartner, & Yamamoto, 2015; Marigold et al., 2014; Mojaverian & Kim, 2012), it is possible that the vignettes were not perceived as fully realistic by participants. Relatedly, the vignettes focused on the type of social support desired by participants, whereas in daily life participants may also be supported in ways that they do not find helpful. Nevertheless, in the current study some support was found for the use of writing exercises to strengthen quitter self-identity, and the study provided insight into smokers' conceptualizations of quitter identities, as well as their responses to imagined social support for quitting.

Future research is needed to replicate the current findings suggesting increases in quitter self-identity, and to investigate ways to make quitter self-identity strengthening exercises more effective and beneficial for a larger group of smokers. For example, participants may spend more time thinking or writing about their mental images (King, 2001; Layous et al., 2013; Murru & Martin Ginis, 2010; Ouelette et al., 2005), and more and more detailed questions (Murru & Martin Ginis, 2010; Ouelette et al., 2005), more frequent writing exercises, or reminders may be used (King, 2001; Layous et al., 2013; Murru & Martin Ginis, 2010; see Frattaroli, 2006 for similar findings regarding expressive writing more generally). Furthermore, an interesting route to explore is the inclusion of undesired possible selves, as desired selves are more effective in success-likely contexts whereas undesired selves are more effective in failure-likely contexts (Oyserman et al., 2015). Given that smokers differ in their expectations of quit success (e.g., Hendricks et al., 2014), different selves may benefit different smokers. It may also be beneficial to strengthen both desired (i.e., quitter) and undesired (i.e., continuing smoker) identities within the same person, as this will facilitate strategies to both approach the desired future identity and avoid the undesired future identity (Oyserman & James, 2008). Relatedly, contrasting desired and undesired future selves, or desired future selves and undesired current selves may facilitate change (Oettingen, 2012). Finally, people differ in their preferences for verbal or visual processing (e.g., Mayer & Massa, 2003), such that writing exercises may benefit some people more than others. People with a stronger visual preference are expected to respond better to a visually oriented exercise, in which they would, for example, draw or select pictures that fit with their new identity, rather than write about their new identity (Mizock, Russinova, & Shani, 2014; Mizock, Russinova, & DeCastro, 2015). It has been suggested that people with lower socio-economic status prefer visual information over verbal information (Stanczyk, Bolman, Muris, & de Vries, 2011), such that identity interventions involving visual material may be more effective for lower socio-economic status smokers and ex-smokers. Future work should explore what works best for whom, taking into account potential moderators such as future

time perspective (Strathman, Gleicher, Boninger, & Edwards, 1994), self-concept clarity (McElwee & Haugh, 2010), and processing preference (Mayer & Massa, 2003).

Notwithstanding the limitations, this study was the first attempt to experimentally strengthen quitter self-identity and to manipulate expected support for quitting among daily smokers. Results provide insight into the content of smokers' self-conceptualizations as quitters and suggest that writing exercises are a potentially useful method to strengthen quitter self-identities. In addition, the findings point to potential negative effects of social support for quitting smoking among subgroups of smokers. In sum, our findings provide important building blocks for future research into strengthening identities relevant to smoking cessation.

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APPENDIX A. FULL TEXT OF QUITTER SELF-IDENTITY MANIPULATION.

Note: The text that is specific to the strengthened quitter identity (S) and control condition (C) is between brackets.

On the next screen we will ask you to think about a situation. Please try to immerse yourself in the situation as well as possible and to write down as much as possible about the situation. There are no right or wrong answers, we are interested in your thoughts when you imagine the situation.

(*Next screen*)
Please imagine that you are someone who is in the process of [S: quitting smoking/C: washing hands more often]. Try to immerse yourself in this situation as much as possible. Imagine that you are in the process of [S: quitting smoking/C: washing hands more often] and think of which ***positive*** effects this has on you as a person.
Take your time to imagine the situation and to immerse yourself in the situation as well as possible. Please describe as elaborately as possible all ***positive*** things that you think about when you are in the process of [S: quitting smoking/C: washing hands more often] in response to the questions:
Why would I want to [S: be a quitter/C: wash my hands more often]? (Mention all positive things that you can think of)
I would want to [S: be a quitter/ C: wash my hands more often], because…

(Text box)
Why does [S: being a quitter/C: washing my hands more often] fit with who I am? (Mention all positive things that you can think of)
[S: Being a quitter/ C: Washing my hands more often] fits with who I am, because…

(Text box)
Why does [S: quitting smoking/ C: washing my hands more often] fit with how I live? (Mention all positive things that you can think of)
[S: Quitting smoking/ C: Washing my hands more often] fits with how I live, because…

(Text box)
You have just noted all positive things that you think about when you would [S: quit smoking/ C: wash your hands more often]. Which of these positive things if **most important** for you?
(Text box)

APPENDIX B. FULL TEXT OF SOCIAL SUPPORT MANIPULATION.

Note: Vignettes for support present and support absent were tailored to the types of support that participants desired. The vignettes for support present and absent shown below are examples. The text that is specific to the support present (P) and support absent condition (A) is between brackets. An example vignette is provided for support present and support absent. The content of the vignette depended on the types of support that participants selected during the pre-test.

All conditions:

Please imagine that you are someone who is in the process of quitting smoking. Try to immerse yourself in this situation as much as possible. Take your time to imagine the situation and to immerse yourself in the situation as well as possible. Imagine the following situation as if you are the person in this situation:

Support present / support absent (example):

I am in the process of quitting smoking. The people around me know about this, but do not support me. They [P: often/ A: almost never] compliment me on not smoking. They also [P: often/ A: almost never] express pleasure at my efforts to quit and they [P: often/ A: almost never] help to calm me down when I am feeling stressed or irritable.

Control:

My heart beats almost every second, without me being aware of it. When I am relaxed, it beats calmly and frequently, but when I am busy my heart beats faster and I can feel the beats. Because movement increases heart rate and lung capacity, much movement improves blood circulation. Quitting smoking also affects the blood circulation.

All conditions:

Imagine this situation. How would it feel?

(Text box)
What would it do to you?
(Text box)

APPENDIX C. DATA CODING FOR RESPONSES TO IDENTITY AND SUPPORT MANIPULATIONS.

Two independent raters coded the responses to the identity and support manipulations for all participants on each of the categories in the coding scheme. The content of the written responses was coded in five sets of variables that captured whether each response concerned (A) reasons to become a quitter, (B) emotions in relation to smoking and quitting, and (C) presence of a positive link between quitting and identity (i.e., lifestyle and self-perception as a person). In addition, (D) the type of motivation (i.e., approach of positive aspects of quitting, or avoidance of negative aspects of smoking) as well as (E) the temporal orientation of the written responses (i.e., present or future) were taken into account. For example, the response 'Less damage to my health when I am older' would be coded as a health reason that is focused on the future and on avoidance of negative aspects of smoking. Instead, the response 'It's better for my health and I will breath more easily' would be coded as a health reason that is focused on the present and on positive aspects of quitting. Codes for the quitter identity manipulation were based on the combination of responses to the four questions that were used in the identity manipulation. Similarly, the codes for the social support manipulation were based on the combination of responses to the two question of the support manipulation. We coded whether participants responded positively (e.g., 'It would motivate me to persist'), negatively (e.g., 'I would feel alone'), mixed (e.g., 'Supported but also irritated'), or in a neutral way (e.g., 'Does not matter', or 'Nothing').

APPENDIX D. DIFFERENCES BETWEEN 'DROP-OUTS' AND 'RESPONDERS' IN BACKGROUND VARIABLES: CHI-SQUARE TEST AND ONE-WAY ANOVAS.

		Drop-outs *(n = 202-213)*	*Responders* *(n = 326-339)*	
Characteristic		*Frequency (Expected count)*		χ^2 *statistic*
Gender	Male	92 (83)	122 (131)	$\chi^2(1) = 2.86, p = .09, V = .07$
	Female	121 (130)	217 (208)	
		M (SD)		*t statistic*
Age		36.10 (16.87)	44.85 (17.39)	$t(550) = -5.82, p < .001, d = .51$
Years smoked		17.34 (15.36)	26.75 (17.37)	$t(464) = -6.55, p < .001, d = .57$
Number of cigarettes per day		14.68 (10.80)	15.71 (8.16)	$t(528) = -1.25\ p = .21, d = .11$

* $p < .05$; ** $p < .01$.

Note. 'Responders' were defined as those who completed the post-test measure, and 'drop-outs' were those who did not complete the post-test measure.

APPENDIX E. DIFFERENCES BETWEEN EXPERIMENTAL CONDITIONS ON BACKGROUND VARIABLES AND PRE-TEST MEASURES: TWO-WAY ANOVAS (N = 324).

Manipulation condition		Mean (Standard deviation)				
Social support	*Identity*	*Age*	*Years smoked*	*Number of cigarettes per day*	*Quitter self-identity*	*Quit-intention*
Present	Quitter	42.57 (15.84)	24.27 (15.05)	14.14 (7.95)	3.29 (.72)	5.50 (1.91)
	Control	45.67 (17.32)	27.64 (18.01)	17.13 (8.64)	2.91 (.81)	4.60 (2.48)
	Total	44.39 (16.72)	26.23 (16.84)	15.92 (8.46)	3.06 (.79)	4.97 (2.30)
Absent	Quitter	40.40 (17.13)	22.50 (16.62)	14.15 (7.28)	2.97 (.64)	4.85 (2.22)
	Control	46.44 (17.43)	28.35 (17.98)	15.54 (8.52)	3.02 (.85)	4.63 (2.11)
	Total	43.87 (17.48)	25.82 (17.57)	14.94 (8.00)	3.00 (.76)	4.73 (2.15)
Control	Quitter	44.84 (15.72)	27.41 (15.34)	16.22 (7.15)	3.06 (.76)	4.78 (2.16)
	Control	42.67 (18.97)	23.58 (18.21)	15.42 (8.04)	3.13 (.82)	5.31 (2.24)
	Total	43.86 (17.22)	25.68 (16.73)	15.86 (7.54)	3.09 (.78)	5.02 (2.20)
Total	Quitter	42.79 (16.21)	24.92 (15.72)	16.10 (8.43)	3.10 (.72)	4.81 (2.29)
	Control	45.12 (17.79)	26.77 (18.06)	14.94 (7.45)	3.01 (.83)	5.01 (2.12)
		ANOVAs				
		Age	*Years smoked*	*Number of cigarettes per day*	*Quitter self-identity*	*Quit-intention*
Independent variable	Identity condition	$F(1,318) = 1.42$, $p = .23$, $\eta_p^2 < .01$	$F(1,318) = .88$, $p = .35$, $\eta_p^2 < .01$	$F(1,318) = 1.69$, $p = .19$, $\eta_p^2 < .01$	$F(1,318) = .97$, $p = .33$, $\eta_p^2 < .01$	$F(1,318) = .61$, $p = .44$, $\eta_p^2 < .01$
	Support condition	$F(2,318) = .04$, $p = .96$, $\eta_p^2 < .01$	$F(2,318) = .03$, $p = .97$, $\eta_p^2 < .01$	$F(2,318) = .43$, $p = .65$, $\eta_p^2 = .01$	$F(2,318) = .60$, $p = .55$, $\eta_p^2 < .01$	$F(2,318) = .68$, $p = .51$, $\eta_p^2 < .01$
	Identity/ support interaction	$F(2,318) = 1.55$, $p = .21$, $\eta_p^2 = .01$	$F(2,318) = 2.32$, $p = .10$, $\eta_p^2 = .01$	$F(2,318) = 1.40$, $p = .25$, $\eta_p^2 = .01$	$F(2,318) = 2.82$, $p = .06$, $\eta_p^2 = .02$	$F(2,318) = 2.75$, $p = .07$, $\eta_p^2 = .02$

APPENDIX F. DIFFERENCES BETWEEN PARTICIPANTS WHO DID AND DID NOT COMPLY WITH IDENTITY MANIPULATION INSTRUCTIONS IN BACKGROUND CHARACTERISTICS: CHI-SQUARE TESTS AND ONE-WAY ANOVAS (N = 339).

		Frequency (Expected count)		
		Non-compliers (n = 15)	Compliers (n = 311-324)	χ^2 statistic
Gender	Male	7 (5)	115 (116)	$\chi^2(1) = .78, p = .38, V = .05$
	Female	8 (10)	209 (207)	
		M (SD)		t statistic
Age		62.40 (14.74)	44.04 (17.09)	$t(15.80) = 4.68, p < .001, d = 1.15$
Years smoked		44.80 (15.67)	25.91 (17.01)	$t(335) = 4.22, p < .001, d = 1.16$
Number of cigarettes per day		18.73 (10.81)	15.57 (8.00)	$t(324) = 1.47, p = .14, d = .33$
Quitter self-identity		1.99 (.97)	3.05 (.78)	$t(337) = -5.10, p < .001, d = 1.20$

Note. Those who did and did not comply with identity manipulation instructions are referred to as 'compliers' and 'non-compliers', respectively.