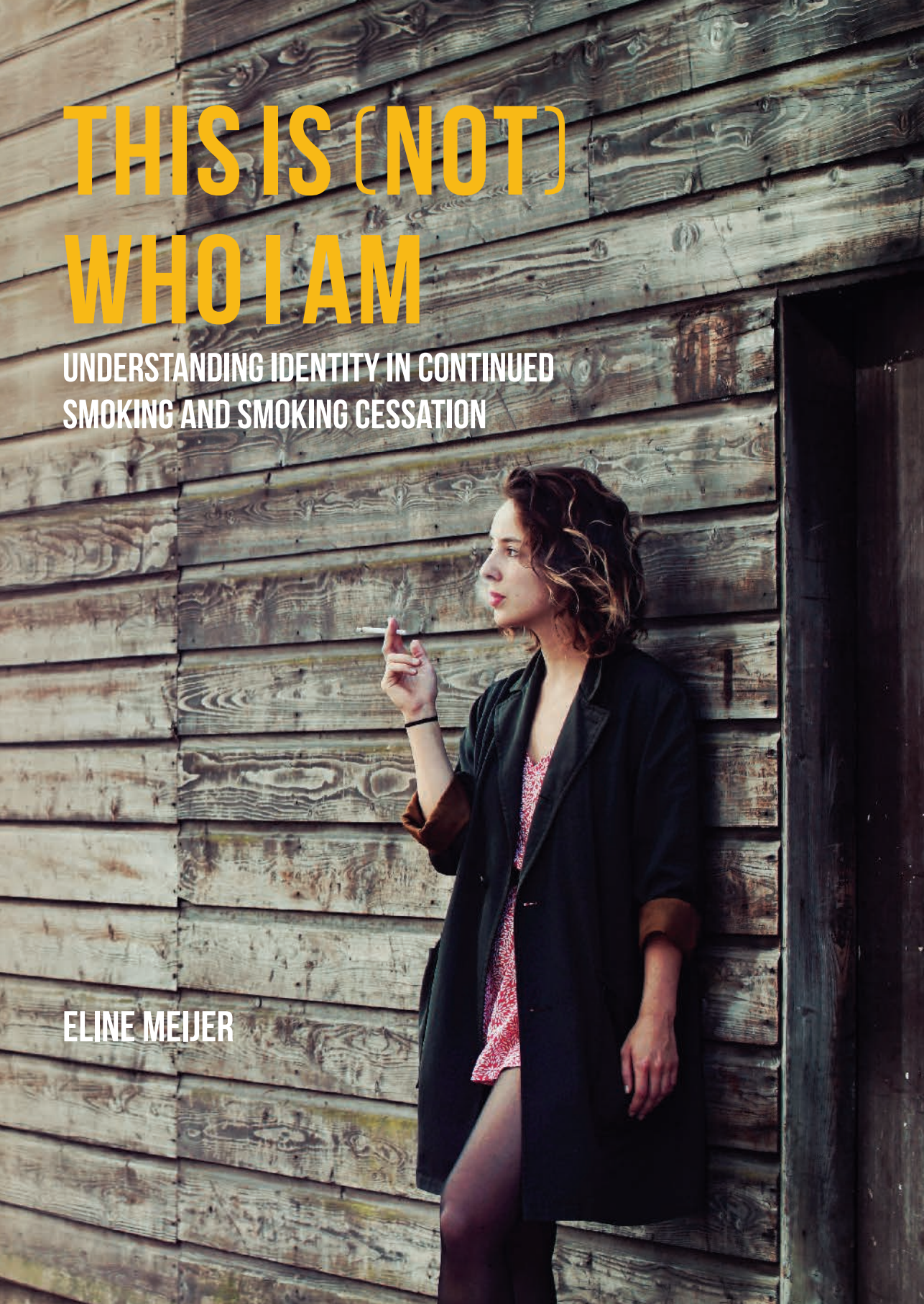
This is [not] who I am : understanding identity in continued smoking and smoking cessation

Meijer, E.

THIS IS (NOT) WHO I AM

UNDERSTANDING IDENTITY IN CONTINUED SMOKING AND SMOKING CESSATION



ELINE MEIJER

This is (not) who I am

Understanding identity in continued smoking and smoking cessation

Eline Meijer

Ontwerp: Susanne Keilhack (Buro Fritz) en Thessa Meijer
Fotografie: Myrthe Mosterman

Layout: Ridderprint BV - www.ridderprint.nl
Printed by: Ridderprint BV - www.ridderprint.nl

This is (not) who I am

Understanding identity in continued smoking and smoking cessation

Proefschrift

ter verkrijging van
de graad van Doctor aan de Universiteit Leiden,
op gezag van Rector Magnificus prof. mr. C. J. J. M. Stolker,
volgens besluit van het College voor Promoties
te verdedigen op dinsdag 14 november 2017
klokke 11.15 uur

Door

Eline Meijer
geboren te Leeuwarden
in 1990

PROMOTIECOMMISSIE

Prof. dr. W. van Dijk
Prof. dr. A. J. W. van der Does
Prof. dr. N. Ellemers, Universiteit Utrecht
Prof. dr. R. West, University College London

Promotores:	Prof. dr. A. W. M. Evers
	Prof. dr. C. van Laar, Katholieke Universiteit Leuven
Co-promotor:	Dr. W. A. Gebhardt

CONTENTS

CHAPTER 1

INTRODUCTION

I am working in the health area, but that's what they say, it's easier to teach something to someone else than to do it yourself. I have that, that causes friction. Like, for example, that I smoke, people always say "it does not fit with you". And initially.. It sounds so stupid, with whom would it fit? What would that be? But actually it does not fit with me at all.. And, and my job, and, and… Things that I find important. (Esther, smoker for eight years)

I find myself a real, I find myself a real smoker yes. Yes. Yes. I don't really know why though, but err, yes. I find err... yes. You have these people who smoke and you think, yeah, are you, you just shouldn't smoke, because it is, it looks ridiculous, sorry, but err yes (…) *but I find myself a real smoker, yeah. I think it really fits with me, yeah.* (Louis, smoker for 30 years)

These are quotes from two smokers, Esther and Louis, who smoked 23 and 20 cigarettes per day, respectively. Although their smoking behavior is similar, the role that smoking plays in the way they see themselves is very different. Whereas Louis appears to feel comfortable with being a 'real smoker', Esther feels that smoking conflicts with her job, the things that she finds important in life, and, essentially, with who she is. Esther experiences a discrepancy between her behavior and the way that she perceives herself, her identity. Such a discrepancy may be the start of a process of quitting smoking. Other smokers, such as Louis, perceive smoking as fitting with who they are, and do not experience the friction that Esther experiences. These identities in relation to smoking and quitting are the focus of this dissertation. Specifically, this dissertation examines how different identities that are relevant to smoking affect smoking behavior (RQ1); how identity changes over time (RQ2); and whether associations between identity and smoking-related outcomes, as well as identity change processes, differ between people with lower and higher socio-economic status (RQ3).

The problem of smoking

Smoking constitutes a major health problem worldwide. The consequences of smoking are well known: smoking tobacco is a major risk factor for various severe diseases such as cancer, cardiovascular diseases and lung diseases; smoking negatively affects surgery outcomes; and smoking during pregnancy harms the unborn child both in the short term and long term, amongst other effects (US Department of Health and Human Services, 2014). In the Netherlands alone, smoking leads to the estimated premature death of 20.000 smokers per year, who on average die ten years earlier than nonsmokers (Nationaal Expertisecentrum Tabaksontmoediging, 2015). The associated health care costs are estimated to be almost 3 billion euros annually (Nationaal Expertisecentrum Tabaksontmoediging, 2015). In addition, smoking is associated with subsequent depression and anxiety (Fluharty, Taylor, Grabski, & Munafo, 2017). Conversely, quitting smoking not only improves physical health outcomes, but also increases psychological

well-being (Krebs et al., 2016). Smokers typically are aware of the dangers of smoking and the advantages of quitting smoking, and around 80% of smokers in the Netherlands want to quit smoking in the future. Nevertheless, many smokers continue to smoke and the large majority of smokers who attempt to quit relapse. Each year, around 30% of Dutch smokers attempt to quit, but around 90% of them relapse within a year (Nationaal Expertisecentrum Tabaksontmoediging, 2015).

Smoking and socio-economic status

Importantly, smoking is more prevalent and persistent among those with lower socio-economic status (i.e., a person's relative position in the social hierarchy (Mackenbach & Kunst, 1997)), and thereby increases health inequalities (Bricard, Jusot, Beck, Khlat, & Legleye, 2016; Reid, Hammond, Boudreau, Fong, & Siahpush, 2010). In the Netherlands in 2015, 26% of people with lower socio-economic status (SES) were smokers, compared to 12% of those with higher SES (Nationaal Expertisecentrum Tabaksontmoediging, 2016). Lower SES-smokers have weaker intentions to quit, are less successful when attempting to quit, and experience a quit attempt more negatively than their higher SES counterparts (Fernandez et al., 2006; Pisinger, Aadahl, Toft, & Jorgensen, 2011; Reid et al., 2010; Wetter et al., 2005). Moreover, antismoking measures such as mass media campaigns are less effective among lower SES smokers than higher SES smokers (Giskes et al., 2007; Nagelhout, Willemsen, & de Vries, 2011).

Lower SES smokers are more likely to be part of groups in which smoking is common, whereas higher SES smokers are more likely to find themselves in groups that encourage them to quit (Honjo, Tsutsumi, Kawachi, & Kawakami, 2006; Sorensen, Emmons, Stoddard, Linnan, & Avrunin, 2002; Wiltshire, Bancroft, Parry, & Amos, 2003). As such, lower SES smokers who attempt to quit may have to swim against the tide, whereas higher SES smokers are more likely to conform to the social norms in their environment by quitting smoking. For example, a qualitative study among blue-collar workers showed that quitting smoking was perceived as 'leaving the gang', and that group members attempted to evoke relapse to keep the quitter within the group (Katainen, 2012). Relatedly, social support for quitting smoking is less available for lower SES smokers (Pisinger et al., 2011; Sorensen et al., 2002), while we know that receiving social support for quitting is associated with stronger intentions to quit, quitting self-efficacy, adaptive coping and, importantly, quit success (Rayens, Hahn, & Nicholson, 2011; Rice et al., 1996; Sorensen et al., 2002; Webb Hooper, Baker, & McNutt, 2013). Taken together, this means that lower SES smokers, for whom quitting smoking is more difficult than for higher SES smokers, have fewer health-promoting resources that may help them to quit successfully.

Why traditional theories are limited in their explanations of smoking behavior

Two influential psychological theories -the theory of planned behavior (Ajzen, 1988, 1991) and social cognitive theory (Bandura, 1991, 2001)- can and have been used to explain continued smoking and quit attempts. The theory of planned behavior proposes that behavior results from intentions to engage in behavior, which results from social norms, attitudes and perceived behavioral control. As such, smokers who perceive that other people disapprove of smoking and approve of quitting, who evaluate smoking negatively, and perceive that quitting smoking is relatively easy for them should form stronger intentions to quit smoking, and subsequently attempt to quit. Social cognitive theory proposes that people are agents who steer their own behavior in the context of factors associated with the behavior (e.g., skills), cognitions (e.g., outcome expectancies) and the environment (e.g., other people's behaviors). The regulation of behavior is strongly affected by self-efficacy, that is, individuals' perceptions of their capability to perform the behavior (Bandura, 1991, 2001), with people who endorse stronger self-efficacy beliefs being more inclined to persist in the face of difficulty. In addition, behavior is motivated by anticipation of future outcomes of the behavior. As such, smokers who feel capable of quitting and believe that quitting will result in better health are more likely to attempt to quit. Furthermore, people learn new behaviors and adapt existing behavioral patterns as they observe others and engage in similar behaviors (Bandura, 1969).

Although the processes described by the theory of planned behavior and social cognitive theory are well supported, both theories are limited in that they rely heavily on rational factors to explain intentions and behavior, and leave a large share of the variance in intentions and behavior unexplained. For example, theory of planned behavior variables typically explain a maximum of 40% of variance in behavioral intentions, leaving at least 60% of variance unexplained (Rise, Sheeran, & Hukkelberg, 2010). Applying this to smoking means that it is not sufficient for smokers to believe that smoking leads to disease, that other people disapprove of smoking, or that they are capable of quitting, in order for them to quit (e.g., Høie, Moan, & Rise, 2010).

A main proposition of this dissertation is that smoking cessation is compromised when cognitions about the dangers of smoking and advantages of quitting are not sufficiently relevant to the *self*. We propose that smokers should perceive smoking as conflicting with who they are and who they want to become in the future, and nonsmoking as fitting with who they are now and who they want to become, for them to quit smoking. Such self-perceptions are more fundamental, and therefore imbued with stronger emotions, than perceptions of behaviors as being good or harmful, or leading to beneficial or undesirable outcomes. Interestingly, a meta-analysis showed that self-identity explains additional variance in health behavioral intentions beyond the traditional theory of planned behavior variables of attitude, perceived behavioral control and social norms (Rise et al., 2010). Furthermore, although identity does not play an important role in

social cognitive theory, Bandura occasionally mentioned identity as an influence on behavior. For example, he stated that "Those who have a firm sense of identity and are strongly oriented toward fulfilling their personal standards display a high level of self-directedness. Those who are not much committed to personal standards adopt a pragmatic orientation, tailoring their behavior to fit whatever the situation seems to call for" (Bandura, 1991, p. 253). In other words, identity may serve as a stable source of behavior (West, 2006), and is therefore very likely to be relevant in the context of smoking. The sections below will explain what identity is, and what is already known about the relationship between identity and smoking.

What is identity?

Identity refers to the core perceptions that we, as humans, have of who we are. Identity has been studied widely, and many different conceptualizations and theories of identity have been forwarded. A fundamental question is whether identity, the essence of who we are, can change after adolescence which is typically considered as the main period in which identity is formed (Erikson, 1968). Approaches that conceptualize identity as stable describe identity as a collection of unchanging characteristics that people perceive themselves to have (e.g., Hagger, Anderson, Kyriakaki, & Darkings, 2007; Hitlin, 2003), or as a set of personally relevant values, such that people perceive themselves in terms of their 'ideals worth striving for' (Hitlin, 2003, p. 121). In line with this reasoning, people prefer to perceive themselves in a consistent way, such that they actively search for information about themselves that verifies their self-perceptions, and may also ignore or reject information that is discrepant with their identity (Asencio & Burke, 2011; Markus & Kunda, 1986). However, in this dissertation it is assumed that identity can change. In other words, people may perceive themselves differently in different (social) situations and identity may develop over time (Markus & Kunda, 1986). For example, identity theory (Stets, 2006) states that identity is based on the social roles that people have, such as the role identity as a partner or teacher. According to this theory, people's self-perceptions are based on the behaviors, meanings and expectations that are associated with these roles, and people behave in line with the roles that are central to their identity in a given situation. Similarly, the active self account suggests that people hold multiple self-concepts, of which only a subset is active in the 'active self-concept' and exerts influence on behavior (Wheeler, Demarree, & Petty, 2007).

Two theoretical approaches are particularly relevant for this dissertation: PRIME theory of motivation (West, 2006) and the social identity approach (Tajfel & Turner, 1979, 1986; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). PRIME theory was developed to explain addiction, and states that identity affects behavior more strongly than other representations (e.g., outcome expectations such as 'smoking causes COPD') (West, 2006). Identity consists of labels (e.g., 'I am a nonsmoker'), attributes (e.g., 'independent')

and rules (e.g., 'I stay abstinent'). An important tenet of PRIME theory is that behavior results from the balance in a specific moment between wants - such as anticipation of pleasure, and needs - such as anticipation of relief. For example, when smokers who are in the process of quitting smoking encounter a situation in which they might smoke, the balance between their needs and urges to smoke or to refrain from smoking at that specific moment will affect whether the individual will smoke or not. Identity directly affects these wants and needs through the rules associated with the identity, whereas intentions and beliefs are further away from behavior. As such, a deeply embedded identity is a source of stable behavior, whereas intentions and beliefs are less likely to influence the impulses and urges that may strongly fluctuate across situation and over time. We therefore expect smokers who strongly perceive themselves 'to be' smokers to continue smoking, and to be more likely to relapse if they attempt to quit, whereas we expect smokers who identify more strongly with nonsmoking to be more likely to quit smoking successfully.

PRIME theory does not specify the sources of identity, but other theories shed light on how identities are formed. The social identity approach (Turner et al., 1987) states that a large part of identity is based on memberships in groups or social categories, such that people may hold a social identity for example as a student or woman, or as a smoker or nonsmoker. People are motivated to behave in line with the group's social norms when their social identification with the group is strong (Tajfel & Turner, 1979, 1986). As such, compared to smokers who identify with nonsmokers, those who strongly perceive themselves as part of the group of smokers are more likely to engage in smoking behavior, in line with the norms associated with their social smoker identity. As people are part of multiple groups, they also hold multiple social identities. However, only those identities that are salient in a given situation exert an influence on behavior, and thus behavior depends on which identities are salient in a particular context. In addition to social identities, people have a personal identity, which refers to a person's perception of the self as a unique person that is different from others.

This dissertation integrates PRIME theory and social identity theory, and focuses on 'self-identity' and 'group-identity' in relation to smoking. Self-identity refers to perceptions of the self as a person, which can be based on certain behaviors. For example, a strong smoker self-identity means that smoking as a behavior is important for how a smoker perceives himself. As shown in the quote above this introductory chapter, engaging in the behavior of smoking is not necessarily associated with a strong smoker self-identity. Instead, smokers may identify more strongly with quitting or nonsmoking (i.e., perceive quitting or nonsmoking as fitting with who they are) than with smoking. Based on PRIME theory, we maintain that strong self-identities are a stable guide for behavior. The concept of self-identity is different from the construct of personal identity in social identity theory, which concerns an individual's self-perception as being dif-

ferent from other people. As such, self-identities (e.g., as a smoker) may be part of an individual's personal identity as a unique human being. Group-identity refers to the part of a person's identity that is based on membership in groups, and thereby resembles the construct of social identity in the social identity approach. For example, a smoker with a strong smoker group-identity identifies strongly with other smokers and perceives himself as a member of this group. In analogy with self-identity, smokers may identify more strongly with nonsmokers than with smokers. Self-identities and group-identities, together, define how smokers and ex-smokers perceive themselves in relation to smoking.

Finally, in addition to current self-perceptions, people have expectations of who they will become in the future, that is, their possible selves (Markus & Nurius, 1986). Possible selves "represent individuals' ideas of what they might become, what they would like to become, and what they are afraid of becoming" (Markus & Nurius, 1986, p. 954), and can therefore be positive or negative. For smokers, the identities as quitter or nonsmoker mentioned above can be conceived of as possible selves. For example, smokers who identify with nonsmoking hold an ideal possible self as a nonsmoker. Possible selves provide a source of motivation for behavior in the present. People are motivated to engage in behavior that will lead them to become their ideal possible self, and to avoid behavior that will lead them to become their feared possible self (Barreto & Frazier, 2012; Oyserman & James, 2011). Possible 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 a feared possible self as an ill continuing smoker than with reference to an ideal possible self as an occasional smoker without health problems (Markus & Nurius, 1986). In sum, this dissertation focuses on self- and group-identities relevant to smoking and quitting, which can be current selves (as a smoker) or possible selves (as a nonsmoker or quitter). Identities are assumed to be changeable over time.

How does identity change?

Different aspects of identity are likely to be important across different situations, as was stated above. However, in addition to such changes, which are likely to be relatively subtle, identity may also change more profoundly. Identity shift theory (Kearney & O'Sullivan, 2003) proposes that people may come to perceive themselves differently in response to negative experiences associated with their current identity. Specifically, accumulating evidence of conflict between behavior and values may initiate identity change. For example, a smoker who is smoking outside in the rain may experience conflict between this behavior and important values such as independence. Subsequent changes in identity affect, and are effected by, behavior change. Identity control theory (Burke, 2006) also suggests that identity change is initiated by conflict. Specifically, this theory proposes that an identity change process is initiated by conflict between mean-

ings of two identities such as the identities as smoker and parent, or by conflict between an identity and self-relevant meanings in a situation, for example being a smoker and becoming pregnant. People are then motivated to change the meaning of an identity to make it more compatible with another, more important identity, or with self-relevant meanings of the situation. For example, smokers may come to perceive their identity as a smoker in less negative terms in order to decrease conflict with their identity as a parent. They may come to perceive their smoking as actually being positive because of their belief that quitting smoking would make them irritable in the presence of their children. In sum, both identity shift theory (Kearney & O'Sullivan, 2003) and identity control theory (Burke, 2006) propose that identity change is initiated by a conflict that people wish to resolve.

The social environment also plays a role in identity change. For example, work on identity compatibility shows that people more easily adopt new identities that fit in with their social environment (Iyer, Jetten, Tsivrikos, Postmes, & Haslam, 2009). Furthermore, two recently developed models underscore the contribution of the social environment to activating and strengthening new identities in the process of recovery from addiction. According to the Social Identity Model of Cessation Maintenance (Frings & Albery, 2015), therapeutic groups may facilitate the activation of recovery identities, for example 'I am a person in recovery from alcohol abuse'. Individuals may also derive self-esteem and self-efficacy from group membership. Recovery identities can be strengthened when groups provide social support for cessation maintenance, and encourage recovering individuals to behave corresponding with pro-recovery group norms. Similarly, the Social Identity Model of Recovery states that recovery identities are strengthened when shared with other members of social groups who favour recovery (Best et al., 2015). When individuals become increasingly identified with the group - and internalize its norms and values - the new social identity and its associated norms will guide subsequent behavior. Eventually, behavior becomes increasingly dependent on rooted identities and increasingly independent of social norms.

Identity and smoking

There is already existing research suggesting the importance of identity in relation to smoking behavior. In general, smoker identities have been investigated more than non-smoker identities. Controlled for other important factors, smokers who identify more strongly with smoking as a behavior or with the group of smokers have weaker intentions to quit, whereas smokers who identify more strongly with quitting have stronger intentions to quit (Høie et al., 2010; Moan & Rise, 2005, 2006; Van den Putte, Yzer, Willemsen, & de Bruijn, 2009). Moreover, longitudinal studies have shown that smokers who identify more strongly with quitting and less strongly with smoking are also less likely to attempt to quit (Moan & Rise, 2005, 2006; Van den Putte et al., 2009). In line

with this, smokers who liked being a smoker were less likely to have attempted to quit six months later (Tombor, Shahab, Brown, & West, 2013), and adolescent smokers with stronger smoker self-identities increased their smoking over time (Hertel & Mermelstein, 2012). Furthermore, intervention studies showed that smokers with a weaker smoker self-identity, a stronger nonsmoker self-identity and negative images of the typical smoker were more likely to be abstinent after treatment (Gibbons & Eggleston, 1996; Shadel, Mermelstein, & Borrelli, 1996). As such, previous work has shown that identity is associated with intentions to quit smoking and smoking cessation. In addition, there is some evidence to suggest that identity may change over time among smokers who quit smoking. Two retrospective qualitative studies among ex-smokers showed that they redefined themselves in the process of quitting, such that they came to perceive themselves more as nonsmokers over time (Brown, 1996; Vangeli & West, 2012). Social support and identification with other quitters appeared to facilitate the identity change toward a nonsmoker identity in these studies. Smokers may also continue to perceive themselves (in part) as smokers after they quit smoking, although identification with smoking decreases with longer abstinence (Vangeli, Stapleton, & West, 2010). In sum, existing work showed that identity is important for smoking and smoking cessation, and that identity may change over time among smokers who quit smoking.

Furthermore, some novel work was published while the studies presented in this dissertation were performed. The finding that ex-smokers come to perceive themselves less as smokers and more as nonsmokers following a successful quit attempt (Brown, 1996; Vangeli et al., 2010) was confirmed by a prospective quantitative study (Tombor, Shahab, Brown, Notley, & West, 2015) and a retrospective qualitative study (Luck & Beagan, 2015). In addition, the prospective study showed that ex-smokers who come to perceive themselves as nonsmokers over time are more likely to stay abstinent (Tombor et al., 2015). Furthermore, the retrospective qualitative study suggests that identification with nonsmoking may be enhanced by changes in meaningful behaviors, for example when ex-smokers replace smoking by physical exercise, which can be a way of expressing the new identity (Luck & Beagan, 2015). Finally, a longitudinal study among adolescents also shed some light on how identity may change, showing that as smokers become more inclined to smoke in order to cope with negative emotions smoker self-identities increase over time (Hertel & Mermelstein, 2016). In addition, in this study male smokers who increasingly smoked for social reasons also came to perceive themselves more strongly as smokers over time. In sum, these recent studies confirm the key role of identity. They show that identity may change after quitting smoking, suggest that identity change may facilitate successful quitting, and provide some insight into how identity may change.

What does this dissertation contribute?

Several questions remained unanswered in the existing literature, and guided the studies that are presented in this dissertation. First, the relative importance of smoker, nonsmoker and quitter self- and group-identities for smoking behavior is unknown, as these identities have as yet not been studied jointly. Chapters 2, 3, 5 and 6 therefore examine how different identities that are relevant to smoking affect smoking behavior (RQ1; see Table 1).

Table 1. Examination of associations between identity constructs and smoking-related variables (RQ1) and moderation by SES (RQ3) in the chapters in this dissertation.

	Smoking-related variables (RQ1)			SES (RQ3)	
Identity constructs	***Intention to quit***	***Smoking behavior***	***Responses to smoking ban in hospitality venues***	***Differences in identity strength***	***Moderation association identity and smoking-related variables***
Self-identity					
Nonsmoker	2, 3, 5	2, 5	2	2,3	2, 3
Quitter	3, 5, 6	5, 6		3	3, 6
Smoker	2, 3, 5, 6	2, 5, 6	2	2,3	2, 3, 6
Group-identity					
Nonsmoker	2, 3, 5	2, 5	2	2,3	2, 3
Quitter	3, 5			3	3
Smoker	2, 3, 5, 6	2, 5, 6	2	2,3	2, 3, 6

Note. Numbers in the table refer to the chapters in this dissertation. Given the deductive nature of the study presented Chapter 5 (interpretative phenomenological analysis), the analysis in that chapter focused on a broader range of identity constructs than those mentioned here.

Second, the process of identity change - both before and after a quit attempt - largely remains unclear. Chapters 4 to 7 investigate how identity changes over time in smokers and ex-smokers, both spontaneously and in response to an intervention, and what factors affect identity change (RQ2; see Table 2).

Third, differences in smoking behavior and social environments between lower and higher SES smokers lead us to expect that identities in relation to smoking differ with SES as well. However, little is known about possible effects of SES on identity processes, although such effects are very likely. To this end, Chapters 2, 3, 6 and 7 examine whether associations between identity and smoking-related outcomes - as well as identity change processes - differ between people with lower and higher SES (RQ3; see Tables 1 and 2). These three research questions are examined in different studies that, together, offer a comprehensive analysis of identity and identity change (see Figure 1). A multi-method approach is employed, including cross-sectional and longitudinal studies; observational and experimental studies; and quantitative as well as qualitative methods.

Table 2. Examination of change in identity constructs (RQ2) and moderation by SES (RQ3) in the chapters in this dissertation.

Factors related to identity change	Identity change (RQ2)			SES (RQ3)
	Quitter self-identity	*Smoker self-identity*	*Smoker group-identity*	*Moderation association factors[a] and identity change*
Smoking behavior	5, 6, 7	5, 6, 7	5, 7	6
Intention to quit	6	6	6	6
SES	7	7		
Psychosocial factors[b]	7	7		
Psychological processes[c]	5	5	5	
Intervention (writing exercise)	4			

Note. Numbers in the table refer to the chapters in this dissertation. Given the deductive nature of the study presented Chapter 5 (interpretative phenomenological analysis), the analysis in that chapter focused on a broader range of identity constructs than those mentioned here.
a. Factors mentioned under "Factors related to identity change".
b. Attitude, perceived health damage, social norms, stigma, acceptance, self-evaluative emotions, health worries, expected social support.
c. As identified (deductively) in the longitudinal interpretative phenomenological analysis study.

In Chapter 2, we use a longitudinal survey with a one-year follow-up among 189 daily smokers to examine how smoker and nonsmoker self- and group-identities and socio-economic status (SES) may predict intention to quit, quit attempts and responses to antismoking measures, in this case, the Dutch smoking ban in hospitality venues (RQ1). In addition, we examine whether these relations are moderated by SES (RQ3), and whether identity predicts quit attempts and responses to antismoking measures beyond intention to quit. This study is the first to directly compare the unique effects of smoker and nonsmoker self- and group-identities, and to examine differences in relations between identity and smoking outcomes between SES groups. It provides new insight into the relative importance of smoker and nonsmoker self- and group-identity, and shows the relevance of considering SES.

Chapter 3 presents the findings of a cross-sectional study among 387 daily smokers. This study investigates how SES is associated with smoking behavior, taking social support and identity factors into account, thereby extending the study presented in Chapter 2. We examine SES differences in the social support that smokers desire and expect to receive if they were to quit smoking, and in the strength of smoker, quitter and nonsmoker self- and group-identities (RQ3). To advance understanding of the role of group identification, we use a comprehensive measure of group-identity that comprises ties (i.e., perceptions of similarity to- and belongingness with group members), centrality (i.e., cognitive centrality of the group), and affect (i.e., feelings associated with

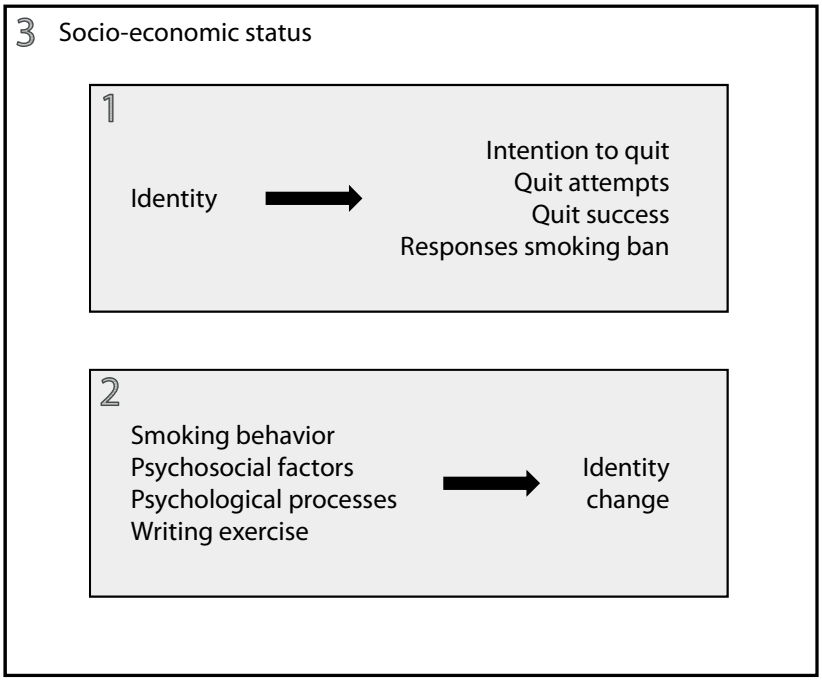


Figure 1. Overview of the research questions that are examined in this dissertation.

group membership) (Cameron, 2004). Furthermore, we use expected social support and identity factors to predict intentions to quit smoking (RQ1), and examine whether these associations differ between lower, middle and higher SES smokers (RQ3). This study shows which particular identity constructs are related to intentions to quit, and highlights the importance of the social environment for lower and higher SES smokers who intend to quit smoking.

Chapter 4 describes the results of an experimental study that examines whether identification with quitting smoking can be strengthened through a writing exercise (RQ2'. This is the first study to attempt to increase identity in the context of smoking. In addition, we examine whether identification with quitting can be facilitated by expected social support for quitting, which is manipulated through experimental vignettes. The study uses a 2 (identity: strengthened quitter identity vs. control) x 3 (social support: present vs. absent vs. control) between-participants design and includes 339 daily smokers who are randomly assigned to the experimental conditions. Results provide insight into the content of smokers' self-conceptualizations as quitters, and provide important building blocks for future research into strengthening identities relevant to smoking cessation.

Chapter 5 presents the in-depth findings of a longitudinal qualitative study on identity change in the process of quitting smoking (RQ1, RQ2). Ten smokers with an intention to quit within two months - including Esther and Louis, whose quotes were shown above –

are interviewed three times over the course of two months. Data are analyzed according to the principles of Interpretative Phenomenological Analysis, which focuses on how people make sense of their experiences and therefore fits very well with the study aims. To date, qualitative work on changes in smoking-related identities is scarce, and no prospective longitudinal studies exist. Importantly, a major benefit of longitudinal work is that identity dynamics can be observed as they occur, whereas retrospective studies may be prone to (recall) bias and are therefore restricted in the identity change processes that they are able to show. In addition, a long-term follow-up allows us to relate the identity dynamics observed in the interviews to smoking status approximately two years later. The findings provide an in-depth understanding of the dynamics of identity change and the mechanisms through which identity change may occur, the factors that may facilitate or hamper this identity change process, and the ways that people find to protect a positive sense of self when they are unsuccessful in quitting smoking.

Chapter 6 examines the reciprocal relations between identity constructs (i.e., smoker self-identity, quitter self-identity and smoker group-identity), and intention to quit and smoking behavior among a large longitudinal sample of 1036 smokers and ex-smokers, using cross-lagged structural equation modeling as an advanced statistical technique (RQ1, RQ2). Moreover, we test whether these relations differ between SES-groups (RQ3). This study is the first large-scale prospective study to disentangle relations between identity and smoking behavior. The results show how identity is related to (subsequent) smoking behavior and intention to quit over time, and vice versa. The findings are replicated using a cross validation sample.

Finally, Chapter 7 examines identity changes over time among both smokers and ex-smokers (RQ2), and whether these changes can be predicted by SES (RQ3) and relevant psychosocial factors (i.e., attitude, perceived health damage, social norms, stigma, acceptance, self-evaluative emotions, health worries, expected social support). This study compliments the studies presented in Chapters 5 and 6 and adds to the understanding of identity change processes. We examine identification with smoking (i.e., smoker self-identity) and quitting (i.e., quitter self-identity) among a large sample of smokers (n = 742) and ex-smokers (n = 201), which allows us to examine identity change both before and after quitting. Latent growth curve modeling is used to model and predict identity change, and results are cross validated beyond the initial sample. This study shows differences in identity development between lower and higher SES smokers and ex-smokers, and identifies which psychosocial factors should be addressed in interventions and campaigns aimed at identity change.

The results of the individual studies described in Chapters 2 to 7 are summarized and integrated in the Discussion. In addition, the implications and limitations of this dissertation are discussed. More insight into identity has the potential to advance theories on identity - such as PRIME theory and the social identity approach - and health

behavior theories more broadly. At a societal level, a deeper understanding of identity and identity change processes among both lower and higher SES groups may serve as the basis for more effective smoking cessation interventions and antismoking measures that help more smokers to quit. Taken together, the studies in this dissertation examine how identity affects smoking behavior, how identity changes, and how these processes differ with SES. It aims to show how smokers like Esther, Louis and many others may move toward becoming a nonsmoker and gain successful abstinence from smoking.

REFERENCES

Ajzen, I. (1988). *Attitudes, personality, and behavior*. Buckingham, UK: Open University Press.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*, 179-211.

Asencio, E. K., & Burke, P. J. (2011). Does incarceration change the criminal identity? A synthesis of labeling and identity theory perspectives on identity change. *Sociological Perspectives, 54*(2), 163-182. doi: 10.1525/sop.2011.54.2.163

Barreto, M. L., & Frazier, L. D. (2012). Coping with life events through possible selves. *Journal of Applied Social Psychology, 42*(7), 1785-1810. doi: 10.1111/j.1559-1816.2012.00918.x

Bandura, A. (1969). Social-learning theory of identificatory processes. In D. A. Goslin (Eds.), *Handbook of Socialization Theory and Research*, (pp. 213-262). Chicago: Rand McNally & Company.

Bandura, A. (1991). Social cognitive theory of self-regulation. *Organizational Behavior and Human Decision Processes*, *50*(2), 248-287.

Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, *52*(1), 1-26. doi: 10.1146/annurev.psych.52.1.1

Best, D., Beckwith, M., Haslam, C., Alexander Haslam, S., Jetten, J., Mawson, E., & Lubman, D. I. (2015). Overcoming alcohol and other drug addiction as a process of social identity transition: the social identity model of recovery (SIMOR). *Addiction Research & Theory, 24*(2), 111-123. doi: 10.3109/16066359.2015.1075980

Bricard, D., Jusot, F., Beck, F., Khlat, M., & Legleye, S. (2016). Educational inequalities in smoking over the life cycle: An analysis by cohort and gender. *International Journal of Public Health, 61*(1), 101-109. doi: 10.1007/s00038-015-0731-6

Brown, J. M. (1996). Redefining smoking and the self as a nonsmoker. *Western Journal of Nursing Research, 18*(4), 414-428. doi: 10.1177/019394599601800404

Burke, P. J. (2006). Identity change. *Social Psychology Quarterly, 69*(1), 81-96.

Cameron, J. E., 2004. A three factor model of social identity. *Self and Identity, 3*(3)*,* 239-262. http://dx.doi.org/10.1080/13576500444000047.

Erikson, E. H. (1968). *Identity: Youth and crisis.* New York: Norton.

Fernandez, E., Schiaffino, A., Borrell, C., Benach, J., Ariza, C., Ramon, J. M., . . . Kunst, A. (2006). Social class, education, and smoking cessation: Long-term follow-up of patients treated at a smoking cessation unit. *Nicotine & Tobacco Research, 8*(1), 29-36. doi: 10.1080/14622200500264432

Fluharty, M., Taylor, A. E., Grabski, M., & Munafo, M. R. (2017). The association of cigarette smoking with depression and anxiety: A systematic review. *Nicotine & Tobacco Research, 19*(1), 3-13. doi: 10.1093/ntr/ntw140

Frings, D., & Albery, I. P. (2015). The Social Identity Model of Cessation Maintenance: formulation and initial evidence. *Addictive Behaviors, 44*, 35-42. doi: 10.1016/j.addbeh.2014.10.023

Gibbons, F. X., & Eggleston, T. J. (1996). Smoker networks and the "typical smoker": A prospective analysis of smoking cessation. *Health Psychology, 15,* 469-477.

Giskes, K., Kunst, A. E., Ariza, C., Benach, J., Borrell, C., Helmert, U., . . . Mackenbach, J. P. (2007). Applying an equity lens to tobacco-control policies and their uptake in six Western-European countries. *Journal of Public Health Policy, 28*(2), 261-280. doi: 10.1057/palgrave.jphp.3200132

Hertel, A. W., & Mermelstein, R. J. (2012). Smoker identity and smoking escalation among adolescents. *Health Psychology, 31*(4), 467-475. doi: 10.1037/a0028923

Hertel, A. W., & Mermelstein, R. J. (2016). Smoker identity development among adolescents who smoke. *Psychology of Addictive Behaviors, 30*(4), 475-483. doi: 10.1037/adb0000171

Høie, M., Moan, I. S., & Rise, J. (2010). An extended version of the theory of planned behavour: Prediction of intentions to quit smoking using past behaviour as moderator. *Addiction Research & Theory, 18*(5), 572-585. doi: 10.3109/16066350903474386

Honjo, K., Tsutsumi, A., Kawachi, I., & Kawakami, N. (2006). What accounts for the relationship between social class and smoking cessation? Results of a path analysis. *Social Science and Medicine, 62*(2), 317-328. doi: 10.1016/j.socscimed.2005.06.011

Iyer, A., Jetten, J., Tsivrikos, D., Postmes, T., & Haslam, S. A. (2009). The more (and the more compatible) the merrier: Multiple group memberships and identity compatibility as predictors of adjustment after life transitions. *British Journal of Social Psychology, 48*(4), 707-733.

Katainen, A. (2012). Smoking and workers' autonomy: A qualitative study on smoking practices in manual work. *Health:, 16*(2), 1-17. doi: 10.1177/1363459311403944

Kearney, M. H., & O'Sullivan, J. (2003). Identity shifts as turning points in health behavior change. *Western Journal of Nursing Research, 25*(2), 134-152. doi: 10.1177/0193945902250032

Krebs, P., Rogers, E., Smelson, D., Fu, S., Wang, B., & Sherman, S. (2016). Relationship between tobacco cessation and mental health outcomes in a tobacco cessation trial. *Journal of Health Psychology*. doi: 10.1177/1359105316644974

Luck, K., & Beagan, B. (2015). Occupational transition of smoking cessation in women: "You're restructuring your whole life". *Journal of Occupational Science, 22*(2), 183-196. doi: 10.1080/14427591.2014.887418

Mackenbach, J. P., & Kunst, A. E. (1997). Measuring the magnitude of socio-economic inequalities in health: An overview of available measures illustrated with two examples from Europe. *Social Science and Medicine, 44*(6), 757-771.

Markus, H., & Kunda, Z. (1986). Stability and malleability of the self-concept. *Journal of Personality and Social Psychology, 51*(4), 858-866.

Markus, H., & Nurius, P. (1986). Possible selves. *American Psychologist, 41*, 954-969.

Moan, I. S., & Rise, J. (2005). Quitting smoking: Applying an extended version of the theory of planned behavior to predict intention and behavior. *Journal of Applied Biobehavioral Research, 10*, 39-68.

Moan, I. S., & Rise, J. (2006). Predicting smoking reduction among adolescents using an extended version of the theory of planned behaviour. *Psychology & Health, 21*(6), 717-738. doi: 10.1080/14768320600603448

Nagelhout, G. E., Willemsen, M. C., & de Vries, H. (2011). The population impact of smoke-free workplace and hospitality industry legislation on smoking behaviour: Findings from a national population survey. *Addiction, 106*(4), 816-823. doi: 10.1111/j.1360-0443.2010.03247.x

Nationaal Expertisecentrum Tabaksontmoediging. (2015). *Roken: een aantal feiten op een rij*. Utrecht: Trimbos Instituut.

Nationaal Expertisecentrum Tabaksontmoediging. (2016). *Roken onder volwassenen en jongeren in Nederland: Kerncijfers 2015*. Utrecht: Trimbos Instituut.

Oyserman, D., & James, L. (2011). Possible identities. In S. J. Schwartz, K. Luyckx, & V. L. Vignoles (Eds.), *Handbook of Identity Theory and Research* (pp. 117-145). New York: Springer.

Pisinger, C., Aadahl, M., Toft, U., & Jorgensen, T. (2011). Motives to quit smoking and reasons to relapse differ by socioeconomic status. *Preventive Medicine, 52*(1), 48-52. doi: 10.1016/j.ypmed.2010.10.007

Rayens, M. K., Hahn, E. J., & Nicholson, D. (2011). Psychosocial characteristics of smokers interested in quitting. *Journal of Health Psychology, 16*(2), 294-302. doi: 10.1177/1359105310373410

Reid, J. L., Hammond, D., Boudreau, C., Fong, G. T., & Siahpush, M. (2010). Socioeconomic disparities in quit intentions, quit attempts, and smoking abstinence among smokers in four western coun-

tries: Findings from the International Tobacco Control Four Country Survey. *Nicotine & Tobacco Research, 12 Suppl*, S20-33. doi: 10.1093/ntr/ntq051

Rice, V. H., Templin, T., Fox, D. H., Jarosz, P., Mullin, M., Seiggreen, M., & Lepczyk, M. (1996). Social context variables as predictors of smoking cessation. *Tobacco Control, 5*(4), 280-285.

Rise, J., Sheeran, P., & Hukkelberg, S. (2010). The role of self-identity in the theory of planned behavior: A meta-analysis. *Journal of Applied Social Psychology, 40*(5), 1085-1105.

Shadel, W. G., Mermelstein, R., & Borrelli, B. (1996). Self-concept changes over time in cognitive-behavioral treatment for smoking cessation. *Addictive Behaviors, 21*, 659-663.

Sorensen, G., Emmons, K., Stoddard, A. M., Linnan, L., & Avrunin, J. (2002). Do social influences contribute to occupational differences in quitting smoking and attitudes toward quitting? *American Journal of Health Promotion, 16*(3), 135-141.

Stets, J. E. (2006). Identity theory. In P. J. Burke (Ed.), *Contemporary social psychological theories*. Stanford, CA: Stanford University Press.

Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33-47). Monterey, CA: Brooks/Cole Publishing Company.

Tajfel, H., & Turner, J. C. (1986). The social identity theory of intergroup behavior. In S. Worchel & W. G. Austin (Eds.), *The psychology of intergroup relations* (pp. 7-24). Chicago, IL: Nelson-Hall.

Tombor, I., Shahab, L., Brown, J., Notley, C., & West, R. (2015). Does non-smoker identity following quitting predict long-term abstinence? Evidence from a population survey in England. *Addictive Behaviors, 45*, 99-103. doi: 10.1016/j.addbeh.2015.01.026

Tombor, I., Shahab, L., Brown, J., & West, R. (2013). Positive smoker identity as a barrier to quitting smoking: findings from a national survey of smokers in England. *Drug and Alcohol Dependence, 133*(2), 740-745. doi: 10.1016/j.drugalcdep.2013.09.001

Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). *Rediscovering the social group: A self-categorization theory*. Oxford: Basil Blackwell.

US Department of Health and Human Services. (2014). The health consequences of smoking- 50 years of progress. A report of the Surgeon General. Atlanta: U.S: Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 17.

Van den Putte, B., Yzer, M., Willemsen, M. C., & de Bruijn, G. (2009). The effects of smoking self-identity and quitting self-identity on attempts to quit smoking. *Health Psychology, 28,* 535-544.

Vangeli, E., Stapleton, J., & West, R. (2010). Residual attraction to smoking and smoker identity following smoking cessation. *Nicotine & Tobacco Research, 12*(8), 865-869. doi: 10.1093/ntr/ntq104

Vangeli, E., & West, R. (2012). Transition towards a 'non-smoker' identity following smoking cessation: an interpretative phenomenological analysis. *British Journal of Health Psychology, 17*(1), 171-184. doi: 10.1111/j.2044-8287.2011.02031.x

Webb Hooper, M., Baker, E. A., & McNutt, M. D. (2013). Associations between coping, affect, and social support among low-income African American smokers. *Addictive Behaviors, 38*(11), 2736-2740. doi: 10.1016/j.addbeh.2013.07.005

West, R. (2006). *Theory of addiction*. Oxford: Blackwell, Addiction Press.

Wetter, D. W., Cofta-Gunn, L., Irvin, J. E., Fouladi, R. T., Wright, K., Daza, P., . . . Gritz, E. R. (2005). What accounts for the association of education and smoking cessation? *Preventive Medicine, 40*(4), 452-460. doi: 10.1016/j.ypmed.2004.07.001

Wheeler, S. C., Demarree, K. G., & Petty, R. E. (2007). Understanding the role of the self in prime-to-behavior effects: the Active-Self account. *Personality and Social Psychology Review, 11*(3), 234-261. doi: 10.1177/1088868307302223

Wiltshire, S., Bancroft, A., Parry, O., & Amos, A. (2003). 'I came back here and started smoking again': perceptions and experiences of quitting among disadvantaged smokers. *Health Education Research, 18*(3), 292-303. doi: 10.1093/her/cyf031

CHAPTER 2

QUITTING SMOKING: THE IMPORTANCE OF NONSMOKER IDENTITY IN PREDICTING SMOKING BEHAVIOR AND RESPONSES TO A SMOKING BAN

Eline Meijer, Winifred A. Gebhardt, Arie Dijkstra,
Marc C. Willemsen, and Colette van Laar

This chapter was published in *Psychology & Health*.

Meijer, E., Gebhardt, W. A., Dijkstra, A., Willemsen, M. C., & Van Laar, C. (2015). Quitting smoking: The importance of non-smoker identity in predicting smoking behaviour and responses to a smoking ban. *Psychology & Health*, *30*(12), 1387-1409. DOI: 10.1080/08870446.2015.1049603

ABSTRACT

Objective

We examined how 'smoker' and 'nonsmoker' self- and group-identities and socio-economic status may predict smoking behavior and responses to antismoking measures (i.e. the Dutch smoking ban in hospitality venues). We validated a measure of responses to the smoking ban.

Design

Longitudinal online survey study with one year follow-up (N = 623 at T1 in 2011; N = 188 at T2 in 2012) among daily smokers. Main Outcome Measures: Intention to quit, quit attempts, and 'rejecting', 'victimizing', 'socially conscious smoking', and 'active quitting' responses to the smoking ban.

Results

Nonsmoker identities are more important than smoker identities in predicting intention to quit, quit attempts, and responses to the smoking ban, even when controlling for other important predictors such as nicotine dependence. Smokers with stronger non-smoker identities had stronger intentions to quit, were more likely to attempt to quit between measurements, and showed less negative and more positive responses to the smoking ban. The association between nonsmoker self-identity and intention to quit was stronger among smokers with lower than higher SES.

Conclusion

Antismoking measures might be more effective if they would focus also on the identity of smokers, and help smokers to increase identification with nonsmoking and nonsmokers.

Keywords: identity; socio-economic status/educational level; smoking cessation; responses; antismoking measures; smoking ban.

How we see ourselves determines greatly our feelings and behavior. According to PRIME theory, our identity likely influences our behavior more strongly than other representations such as specific outcome-expectations (West, 2006). Also, a strong identity will provide relative behavioral stability, whereas impulses and urges may vary in direction and strength over time and across situations, and may lead to less stable behavior. As well as current self-representations, we have expectations and desires with regard to who we want to be (Barreto & Frazier, 2012). People are committed to behave in line with their self-perception of identity, and therefore, behavior change and identity change depend upon each other (Kearney & O'Sullivan, 2003). In line with this, the Transtheoretical Model suggests that an important process of change is 'self-reevaluation', in which people who change an important part of their behavior assess how they think and feel about themselves with regard to this behavior, and create a new self-image (e.g., Prochaska, DiClemente, & Norcross, 1992; Velicer et al., 2008). In addition to perceptions of the self as a person, people derive important parts of their identity from their memberships in groups. In line with social identity theory (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987), smokers may identify with nonsmoking as a behavior (i.e., self-identification as a nonsmoker), or nonsmokers as a group (i.e., group-identification as part of the group of nonsmokers) or both. When identification with a group is stronger, people are more likely to behave in line with the group norms (Tajfel & Turner, 1979; 1986). In the case of smoking, we maintain that smokers are more likely to quit smoking if they can picture themselves as nonsmokers and as part of the group of nonsmokers (i.e., stronger nonsmoker self- and group-identity), and if smoking as a *behavior* and smokers as a *group* are of less importance to their perception of who they are (i.e., weaker smoker self- and group-identity). In the present study, we examined relations between smoker and nonsmoker self- and group-identities and intention to quit, quit attempts and responses to an antismoking measure, the Dutch smoking ban in hospitality venues such as cafés and restaurants. We examined socio-economic status as a possible moderator of the effects of identity, as smokers from lower and higher socioeconomic backgrounds have been found to differ in smoking behavior (e.g., Reid, Hammond, Boudreau, Fong, & Shiapush, 2010).

Smoker and nonsmoker self- and group-identity

The importance of identity in relation to smoking behavior and responses to antismoking measures has been clearly shown. However, direct comparisons between the effects of smoker and nonsmoker self- and group-identities were not possible in the existing literature as the effects of smoker *and* nonsmoker self- *and* group-identity have not been explored jointly. In general, smoker identities have been investigated more than nonsmoker identities. Longitudinal studies using self-report measures have shown that stronger smoker group-identity (the extent to which the person identifies with the *group*

of smokers) predicts lower intentions to quit, and that stronger smoker self-identity (thinking of the self as a person who smokes) predicts fewer quit attempts (Høie, Moan, & Rise, 2010; Moan & Rise, 2005; but see also Moan & Rise, 2006). Also, smokers who liked being 'a smoker' were less likely to have attempted to quit six months later (Tombor, Shahab, Brown, & West, 2013). Intervention studies have shown that smokers participating in smoking cessation treatment were more likely to be abstinent after treatment if they had negative images of the typical smoker, a weak smoker identity and a strong *nonsmoker* identity (Gibbons & Eggleston, 1996; Shadel, Mermelstein & Borrelli, 1996). In line with this, a longitudinal study showed that stronger *quitter* self-identity (thinking of the self as a person who quits smoking) predicted stronger intentions to quit, and both a stronger quitter self-identity and a weaker smoker self-identity predicted more actual quit attempts (Van den Putte, Yzer, Willemsen, & De Bruijn, 2009). To summarize, smokers with weaker smoker self- and group-identities and stronger nonsmoker or quitter self-identities are more likely to move towards nonsmoking.

Identity is not only associated with intention to quit and quit attempts, but also predicts how smokers respond to antismoking measures. Indeed, two experimental studies have shown that smokers with a strong smoker self- or group-identity react defensively when confronted with antismoking measures. Specifically, when confronted with antismoking measures, stronger identity smokers perceived increased support from friends for smoking, and rated the measures as less effective than weaker identity smokers (Falomir-Pichastor & Invernizzi, 1999; Freeman, Hennessy & Marzullo, 2001). Also, a quasi-experimental study showed that, when confronted with a strong antismoking norm, smokers who derived a larger part of their self-esteem from being a smoker responded more defensively and were less positive about quitting smoking than smokers whose self-esteem was less based on being a smoker (Falomir-Pichastor, Mugny, Berent, Pereira, & Krasteva, 2013). In addition to sometimes being ineffective, antismoking measures may even lead to aversive outcomes for some smokers. In a qualitative study, four different responses to the Dutch smoking ban in hospitality venues emerged (Van der Heiden, Gebhardt, Willemsen, Nagelhout, & Dijkstra, 2013). Whereas in response to the ban some smokers became more motivated to quit smoking ('active quitting'), and other smokers agreed to refrain from smoking in areas where smoking is not allowed ('socially conscious smoking'), other smokers responded aversively. Specifically, some smokers felt cornered by the smoking ban and indicated resisting compliance ('rejecting'), and still others felt unable to comply because they considered themselves too addicted to smoking ('victimizing'). In line with the findings described above, we expected identity factors to play a major role in differential responses to antismoking measures. We aimed to extend previous research by investigating the relations of smoker *and* nonsmoker identity with these different responses to the smoking ban in hospitality venues.

Socio-economic status

Identity factors may also interact with socio-economic status (SES) in predicting smoking behavior and responses to antismoking measures. Smoking prevalence is higher among people with a lower SES than among those with a higher SES (Reid et al., 2010). Therefore, the (social) implication of a stronger smoker or nonsmoker identity is likely to be different to smokers from lower and higher SES backgrounds. Whereas for higher SES smokers quitting probably means that they comply with group norms, lower SES smokers who quit smoking may actually need to act against the norms of their group and doing so may entail negative social consequences. Indeed, smokers with lower SES have a higher proportion of smoking peers than higher SES smokers, are more likely to be part of groups in which smoking is the norm, and experience less social pressure to quit (Honjo, Tsutsumi, Kawachi, & Kawakami, 2006; Sorensen, Emmons, Stoddard, Linnen, & Avrunin, 2002; Wiltshire, Bancroft, Parry, & Amos, 2003). A qualitative study even showed that among a group of blue collar workers quitting smoking was associated with leaving the 'gang', and attempts were made to trigger a relapse as a way of keeping the quitter within the group (Katainen, 2011). The impact of antismoking policy has also been found to differ depending on the person's SES (Giskes et al., 2007). For example, workplace smoking bans are less effective among lower SES smokers, and therefore increase rather than decrease socio-economic inequity with regard to health differences (Nagelhout, Willemsen, & De Vries, 2010). Based on these findings, we expect smoker and nonsmoker identities to predict outcomes differently among lower and higher SES smokers. Extending previous work, we included and compared both smoker *and* nonsmoker self- and group-identities, and added SES as a possible moderator of relations between identity and smoking.

Hypotheses

The current study aims to further explore relations between identity and intention to quit, quit attempts and responses to antismoking measures, as well as the moderating influence of SES. We conducted an online longitudinal study among a large group of daily smokers. Data were collected at two time-points, one year apart. We hypothesized that lower SES and stronger smoker self- and group-identities at Time 1 (T1) would predict weaker intentions to quit at T1 and Time 2 (T2) and lower likelihood of one or more quit attempts between T1 and T2 beyond the effects of control variables, whereas higher SES and stronger nonsmoker self- and group-identities at T1 would predict stronger intentions to quit at T1 and T2 and higher likelihood of quit attempts between T1 and T2 beyond controls. We further hypothesized that lower SES, stronger smoker self- and group-identities and weaker nonsmoker self- and group-identities at T1 would predict stronger rejecting and victimizing responses at T2 beyond controls, whereas higher SES, weaker smoker self- and group-identities and stronger nonsmoker self- and group-

identities at T1 would predict stronger active quitting and socially conscious smoking responses at T2 beyond controls. Also, we examined whether the relations between identity and intention to quit, quit attempts and responses to antismoking measures are moderated by SES. Finally, we added intention to quit (T1) in the final steps of the analyses of intention to quit (T2), quit attempts (T2), and responses to the smoking ban (T2) to explore whether identity would still be associated with the outcome variables when intention to quit (T1) was included in the model (see Van den Putte et al., 2009).

METHOD

Participants

Participants were recruited through various media from March 2011 to October 2011. Criteria for inclusion in the analyses were that participants smoked daily at recruitment time and were also daily smokers before the introduction of the Dutch smoking ban in hospitality venues. At T1, each of the participants who completed the entire questionnaire was reimbursed with a gift coupon of 5 Euros, and at T2 five randomly selected participants were rewarded with a gift coupon of 75 Euros.

In total, 1278 smokers started to fill out the T1 questionnaire, of which 623 (48.7%) completed the entire T1 questionnaire. T1 took place in 2011, three years after the instigation of the smoking ban in July 2008. Four-hundred and eighty-seven smokers who participated at T1 and indicated that they were willing to participate again were invited to participate at T2. Of the 487 smokers invited, 189 completed the entire T2 survey instrument (38.8%). Only participants who were still smoking at T2 were included in the statistical analyses ($N = 188$). Participants who were abstinent at T2 were invited to complete an ex-smoker questionnaire, but as this group was too small to use in the analyses ($N = 14$) we will not report on those results here.

Design and procedure

The study employed a longitudinal design. The survey instrument was presented to participants at T1 using the Surveymonkey program (www.surveymonkey.com) and at T2 using the Qualtrics program (www.qualtrics.com). Participants were instructed to fill out the questionnaires by themselves without discussing it with other people. Participants were informed that they could end their participation at any time without having to provide an explanation. After giving informed consent, participants completed the questionnaire. Time needed to complete the T1 and T2 questionnaire was about 30 and 25 minutes, respectively. At the end of the T1 survey instrument, we asked whether participants were interested in participation in a follow-up study. Approximately one year later participants who had indicated willingness to participate in the follow-up re-

ceived a link to the T2 survey instrument by e-mail. Two weeks after the initial invitation, non-responding participants were sent a reminder. The procedure was approved by the University's Ethical Board.

Measures

We measured multiple variables, of which those relevant to the current analyses are described below. All predictor variables were measured at T1. Of the outcome variables intention to quit was measured at T1 and T2, and quit attempts and responses to the smoking ban were measured at T2.

Predictor variables

Demographics.

We asked participants' *gender* and *SES*. To measure SES, we assessed educational level with 1 item asking participants about their highest attained educational level. Educational level is often used as a measure of SES (Schaap & Kunst, 2009). Answer categories ranged from [1] 'no education' – [8] 'university', and [9] 'other, namely…' (this option was not used by participants). For the analyses, SES was converted into two dummy variables representing 3 equally sized groups of participants with lower (no education, only primary school, pre-vocational secondary education, or lower level vocational education), average (middle level vocational education and senior higher secondary education) and higher SES (pre-university education, polytechnic or university level).

Smoking history.

We asked the *number of years participants had been smoking* and their *age at smoking onset*.

Nicotine dependence.

We used the six-item Fagerström Test for Nicotine Dependence (FTND) to measure *nicotine dependence* (Heatherton, Kozlowksi, Frecker, & Fagerström, 1991), for example 'Do you smoke if you are so ill that you are in bed most of the day?'. Instead of measuring the number of cigarettes smoked per day using categories, we asked participants to indicate the actual number of smoked cigarettes. Possible scores on the FTND range from 0 to 10, with higher scores indicating stronger nicotine dependence.

Smoker self-identity.

We used the five-item Smoker Self-Concept Scale to measure strength of smoker self-identity, for example 'Smoking is part of "who I am"' (Shadel & Mermelstein, 1996). A scale was made by averaging scores on the items. Higher scores indicate a stronger smoker self-identity ($\alpha = .85$).

Nonsmoker self-identity.

We used the four-item Abstainer Self-Concept Scale to measure strength of nonsmoker self-identity, for example 'I am able to see myself as a nonsmoker' (Shadel & Mermelstein, 1996). The item 'It is easy to imagine myself as a nonsmoker' (that conceptually overlapped with the item 'I am able to see myself as a nonsmoker') was replaced by an item derived from the Smoker Self-Concept Scale 'Others can view me as a nonsmoker'. A scale was made by averaging scores on the items. Higher scores indicate a stronger nonsmoker self-identity (α = .78).

Smoker group-identity.

We assessed smoker group-identity with one item, 'I feel connected with smokers', [1] 'completely disagree' – [5] 'completely agree'.

Nonsmoker group-identity.

We assessed nonsmoker group-identity with one item, 'I feel connected with nonsmokers', [1] 'completely disagree' – [5] 'completely agree'.

Outcome variables

Intention to quit.

We assessed current levels of *intention to quit*, by asking when (if at all) the participant intended to quit smoking. The answer categories were: 'I intend to [1] quit within 1 month; [2] quit within 6 months; [3] quit within 5 years; [4] quit within 10 years; [5] quit sometime ever, but not within 10 years; [6] always to remain smoking, but less; or [7] always to remain smoking, and not less' (Dijkstra, Bakker, & De Vries, 1997). This variable was recoded, such that higher scores indicated stronger intention to quit.

Number of quit attempts between T1 and T2.

We assessed quit attempts with 1 item, 'How many quit attempts of at least 24 hours did you undertake in 2012?'. This variable was converted into a dichotomous variable (0 = no quit attempts between T1 and T2; 1 = one or more quit attempts between T1 and T2).

Responses to the smoking ban.

We assessed responses to the smoking ban (i.e., rejecting, victimizing, active quitting, socially conscious smoking; Van der Heiden et al., 2013) by asking participants to rate their agreement with 9 items constructed to represent four responses to the smoking ban, for example 'The government has nothing to do with my decision to smoke' (rejecting), 'I am addicted to smoking and cannot quit' (victimizing), 'The smoking ban motivates me to quit' (active quitting), 'If I am not allowed to smoke, I will comply and not do it' (socially conscious smoking) with answers ranging from [1] 'completely disagree'

to [5] 'completely agree'. A principle component analysis confirmed the expected four factors (see Appendix A). Four scales reflecting degree of each of the subtypes were then constructed. The rejecting scale consisted of three averaged items (α = .73), the victimizing scale of one item, the active quitting scale of two averaged items (α = .89), and the socially conscious smoking scale of two averaged items (α = .78). One item was not included in a scale because it loaded on two components. Higher scores indicate a stronger rejecting, victimizing, active quitting, or socially conscious smoking response to the smoking ban.

Analyses

The analyses were conducted in two steps. First we conducted attrition analyses to see if those for whom we had full T1 and T2 data (responders) differed from those for whom we do not have full data (drop-outs). To this end one-way ANOVAs and Chi-square analyses were performed on T1 background variables and T1 variables relevant to the research questions. Preliminary analyses of zero-order correlations between SES and identity were also conducted. Secondly, the main hypotheses were examined using hierarchical linear and logistic regression analyses. We entered gender, age at smoking onset, years smoked and nicotine dependence (measured at T1) as control variables in all analyses by entering them first into the equation (Step 1: enter procedure), together with the two SES dummy variables (as predictors, not controls). We then entered identity variables in Step 2, after which interaction terms were entered in Step 3. Intention to quit (T1) was then added in Step 4 in the analyses of intention to quit, quit attempts and responses to the smoking ban (all measured at T2). Significant interactions were followed by simple slope analyses, using the PROCESS macro for SPSS (Hayes, 2013). Predictor variables were centered. We ensured that assumptions of the analyses were met. We checked for suppression when contrary findings emerged, by examining whether these findings reflected an actual effect of the respective predictor, or whether contrary findings only emerged in the context of the other variables in the analyses.

RESULTS

Attrition analyses

We found no significant differences between responders and drop-outs in SES[1], age at smoking onset, previous quit attempts (lifetime) and nonsmoker self-identity. Compared with drop-outs, responders were significantly older, more likely to be female, had been smoking longer, had stronger smoker self- and group-identities and weaker nonsmoker

1 Although for SES χ^2 was significant, no standardized residuals larger than 1.96 were found for specific cells, indicating absence of significant deviations from the expected counts.

group-identities and were less likely to have attempted to quit since the instigation of the smoking ban (see Appendix B).

Preliminary analyses

Exploration of zero-order correlations between SES and identity showed that SES was significantly and positively correlated with nonsmoker self-identity (r = .18, p = .01) and marginally significant and negatively correlated with smoker self-identity (r = -.14, p = .056), suggesting that the higher their SES, the more smokers see themselves as nonsmokers and the weaker they identify with smoking. Also, the correlation between SES and smoker group-identity was significant and positive (r = .17, p = .02), suggesting that identification with smokers increases with SES (see Appendix C for all correlations).

Hypotheses tests

Identity as a predictor of intention to quit and quit attempts

Intention to quit (T1).

To explore the hypotheses about the effects of identity and SES on intention to quit, we performed two hierarchical linear regression analyses with intention to quit at T1 and T2 as dependent variables. As expected, identity explained intention to quit beyond the control variables and SES (see Table 1). For intention to quit at T1, the first step showed that women, smokers who were less dependent on nicotine, and smokers who had been smoking for a shorter time had significantly stronger intentions to quit. Also, average SES smokers tended to have stronger intentions to quit than lower SES smokers. Importantly, identity predicted intention to quit beyond these variables. As expected, in Step 2 we found that smokers with a stronger nonsmoker self-identity had significantly stronger intentions to quit smoking. Smoker identities did not predict intention to quit. Step 3 subsequently showed a significant interaction between nonsmoker self-identity and higher vs. lower SES (F(1, 169) = 6.38, p =.01, ΔR^2 = .02; see Figure 1). Specifically, the relation between nonsmoker self-identity and intention to quit was stronger among smokers with lower SES (b = 1.95, p < .001) than among those with higher SES (b = 0.83, p < .01).[2]

2 In addition, in the context of these other variables a suppression effect was found, leading the smoker group-identity*SES (higher vs. lower) interaction to take on an unusual form. Specifically, smokers with lower SES had a stronger intention to quit when smoker group-identity was stronger, whereas smoker group-identity was unrelated to intention to quit among higher SES smokers, F(1,169) = 3.24, p = .07, ΔR^2 = .01. This contrary effect became nonsignificant when the analysis was repeated with only the smoker group-identity*SES interaction as predictor of intention to quit in Step 3 (controlled for gender, SES, age at smoking onset, years smoked, nicotine dependence, and identity variables), F(1,176) = 0.43, p = .51, ΔR^2 < .01. Further, regression coefficients for simple slopes became nonsignificant (ps > .10).

Table 1. Explaining 'intention to quit' smoking at T1 and T2 by T1 variables: Hierarchical linear regression analyses ($N = 188$).

	T1			T2			
Predictor	**Model 1**	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Gender (female)	.18*	.15*	.15*	.12^{+}	.10	.09	.01
Age at smoking onset	-.09	-.09	-.12^{+}	.001	.01	.01	.07
Years smoked	-.20**	-.11	-.12^{+}	-.12	-.04	-.06	.003
Nicotine dependence	-.16*	-.03	-.04	-.10	.01	.01	.03
SES (average)[i]	.16^{+}	.13^{+}	.08	.17^{+}	.15^{+}	.10	.06
SES (high)[i]	.08	.04	< .001	.18*	.16^{+}	.14	.14^{+}
Smoker self-identity		-.04	-.07		-.03	-.06	-.02
Nonsmoker self-identity		.50**	.77**		.43**	.54**	.13
Smoker group-identity		-.01	.23^{+}		-.07	.14	.02
Nonsmoker group-identity		-.04	-.02		-.08	.08	.09
Smoker self-identity * SES (average)[i]			.08			.02	-.02
Smoker self-identity * SES (high)[i]			-.02			.02	.03
Nonsmoker self-identity * SES (average)[i]			-.10			.01	.06
Nonsmoker self-identity * SES (high)[i]			-.28*			-.12	.02
Smoker group-identity * SES (average)[i]			-.15			-.16	-.08
Smoker group-identity * SES (high)[i]			-.20^{+}			-.16	-.05
Nonsmoker group-identity * SES (average)[i]			.04			-.21*	-.23
Nonsmoker group-identity * SES (high)[i]			-.10			-.09	-.04
Intention to quit (T1)							.53**

Note. Values in the table are βs. Intention to quit T1 $R^2 = .14$ ($p < .001$) for Step 1, $\Delta R^2 = .22$ for Step 2 ($p < .001$), $\Delta R^2 = .05$ for Step 3 ($p = .08$); Intention to quit T2 $R^2 = .09$ ($p < .01$) for Step 1, $\Delta R^2 = .16$ for Step 2 ($p < .001$); $\Delta R^2 = .04$ for Step 3 ($p = .42$), $\Delta R^2 = .17$ for Step 4 ($p < .001$).

i. Compared with the reference category 'lower SES'.

$^{+}$ $p < .10$; * $p < .05$; ** $p < .01$

Intention to quit (T2).

For intention to quit at T2, results showed that compared with lower SES smokers, smokers with both average and higher SES had stronger intentions to quit at T2. Also, female smokers tended to have stronger intentions to quit. Moreover, on top of these effects, stronger nonsmoker self-identity at T1 significantly predicted stronger intentions to quit at T2. We found no significant effects of smoker identities in Step 2, and no significant

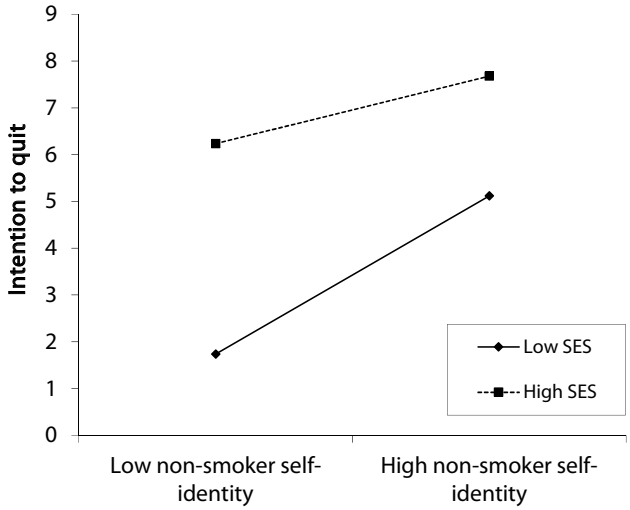


Figure 1. Interaction between nonsmoker self-identity and SES (higher vs. lower) on intention to quit.

interactions in Step 3 (all *p*s > .10).[3] Step 4 showed that smokers with stronger intentions to quit at T1 also had stronger intention to quit one year later (T2). Further, when intention to quit (T1) was added to the model, the association between nonsmoker self-identity and intention to quit (T2) became nonsignificant.

Quit attempts.

To explore the hypotheses about the effects of identity on quit attempts, we performed a hierarchical logistic regression analysis with quit attempts between T1 and T2 as dependent variable. The first step showed no effects of the controls and SES on quit attempts between T1 and T2 (Step 1, see Table 2). As expected, identity predicted quit attempts in Step 2, such that smokers with a stronger nonsmoker self-identity were significantly more likely to have attempted to quit between T1 and T2. We found no significant effects of smoker identities in Step 2, and no significant interactions in Step 3 (all *p*s > .10). Step 4 showed that smokers with stronger intentions to quit at T1 were more likely to have attempted to quit one year later.

3 In addition, in the context of these other variables a suppression effect was found, leading the nonsmoker group-identity*SES (average vs. lower) interaction to take on an unusual form. Specifically, smokers with average SES had a weaker intention to quit when nonsmoker group-identity was stronger, whereas nonsmoker group-identity was unrelated to intention to quit among lower SES smokers, $F(1,169) = 4.34$, $p = .04$, $\Delta R^2 = .02$. This contrary effect became marginally significant when the analysis was repeated with only the nonsmoker group-identity*SES interaction as predictor of intention to quit in Step 3 (controlled for gender, SES, age at smoking onset, years smoked, nicotine dependence, and identity variables), $F(1,176) = 2.78$, $p = .097$, $\Delta R^2 = .01$. Also, the zero-order correlation between nonsmoker group-identity and intention to quit is positive among lower SES smokers ($r = .34$, $p < .01$) and nonsignificant among average SES smokers ($p > .99$).

Table 2. Explaining whether 'quit attempts' were made between T1 and T2 (Y = 1, *n* = 67) or not (Y = 0, *n* = 121) by T1 variables: Hierarchical logistic regression analysis (*N* = 188).

	Model 1		Model 2		Model 3		Model 4	
Predictor	***B***	***OR (95% CI)*** [ii]	***B***	***OR (95% CI)*** [ii]	***B***	***OR (95% CI)*** [ii]	***B***	***OR (95% CI)*** [ii]
Gender (female)	-0.21	0.82 (0.42-1.59)	-0.16	0.85 (0.42-1.71)	-0.15	0.86 (0.43-1.76)	0.11	1.11 (0.53-2.35)
Age at smoking onset	0.01	1.01 (0.93-1.10)	0.02	1.02 (0.93-1.11)	0.02	1.02 (0.93-1.12)	0.05	1.05 (0.95-1.16)
Years smoked	-0.01	0.99 (0.96-1.01)	-0.01	1.00 (0.97-1.11)	-0.004	1.00 (0.97-1.03)	0.003	1.00 (0.97-1.03)
Nicotine dependence	0.03	1.03 (0.90-1.17)	0.08	1.09 (0.94-1.26)	0.08	1.08 (0.93-1.26)	0.10	1.11 (0.94-1.29)
SES (average)[i]	-0.03	0.97 (0.45-2.12)	0.06	1.06 (0.46-2.45)	0.02	1.02 (0.42-2.45)	0.14	1.15 (0.46-2.87)
SES (high)[i]	-0.44	0.65 (0.30-1.39)	-0.35	0.70 (0.31-1.61)	-0.31	0.73 (0.30-1.80)	-0.33	0.72 (0.28-1.84)
Smoker self-identity			0.11	1.11 (0.70-1.77)	0.35	1.42 (0.36-5.62)	0.27	1.32 (0.32-5.47)
Nonsmoker self-identity			0.82**	2.26 (1.43-3.58)	1.24	3.46 (0.77-15.47)	1.23	3.43 (0.73-16.05)
Smoker group-identity			-0.03	0.97 (0.69-1.36)	0.23	1.25 (0.43-3.62)	0.54	1.72 (0.56-5.29)
Nonsmoker group-identity			-0.05	0.96 (0.64-1.43)	0.37	1.45 (0.39-5.36)	0.47	1.60 (0.40-6.39)
Smoker self-identity * SES (average)[i]					-0.03	0.98 (0.30-3.22)	0.10	1.10 (0.33-3.76)
Smoker self-identity * SES (high)[i]					-0.37	0.69 (0.22-2.12)	-0.40	0.67 (0.21-2.18)
Nonsmoker self-identity * SES (average)[i]					-0.21	0.81 (0.22-3.00)	-0.42	0.66 (0.17-2.55)
Nonsmoker self-identity * SES (high)[i]					-0.45	0.64 (0.21-1.99)	-0.85	0.43 (0.13-1.41)
Smoker group-identity * SES (average)[i]					-0.14	0.87 (0.36-2.12)	-0.36	0.70 (0.28-1.77)
Smoker group-identity * SES (high)[i]					-0.30	0.74 (0.30-1.79)	-0.61	0.55 (0.21-1.42)
Nonsmoker group-identity * SES (average)[i]					-0.02	0.98 (0.34-2.86)	0.07	1.07 (0.34-3.37)
Nonsmoker group-identity * SES (high)[i]					-0.56	0.58 (0.21-1.57)	-0.77	0.43 (0.16-1.36)
Intention to quit (T1)							0.34**	1.41 (1.14-1.73)

Note. Step 1 R^2 = .02 (Cox & Snell), .03 (Nagelkerke), Model $\chi^2(6) = 3.57$, $p = .73$; Step 2 R^2 = .10 (Cox & Snell), .13 (Nagelkerke), Block $\chi^2(4) = 15.33$, $p < .01$; Step 3 R^2 = .11 (Cox & Snell), .15 (Nagelkerke), Block $\chi^2(8) = 3.00$, $p = .93$; Step 4 R^2 = .16 (Cox & Snell), .22 (Nagelkerke), Block $\chi^2(1) = 11.22$, $p < .01$.

i. Compared with the reference category 'lower SES'.

ii. OR = Odds Ratio; CI = Confidence Interval.

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

Identity as a predictor of responses to the smoking ban

Next, we examined (above control variables) how identity factors relate to the way smokers respond to the smoking ban in hospitality venues. We performed hierarchical linear regression analysis to explain degree of rejecting, victimizing, active quitting and socially conscious smoking in response to the smoking ban (T2). Specific results can be found in Table 3.

Rejecting.

As expected, identity explained rejecting responses beyond control variables. Step 1 showed that higher nicotine dependence predicted significantly stronger rejecting responses to the smoking ban. Compared with lower SES smokers, higher SES smokers showed significantly weaker rejecting responses, and smokers with average SES showed marginally weaker rejecting responses than lower SES smokers.[4] Controlling for these effects, weaker nonsmoker self- and group-identities significantly predicted stronger rejecting responses (Step 2). Thus, the less smokers pictured themselves as nonsmokers and part of the group of nonsmokers, the more they rejected the smoking ban. We found no effects of smoker identities in Step 2, and no significant interactions in Step 3 (all *p*s > .10). Step 4 showed that smokers with weaker intentions to quit showed significantly stronger rejection responses.

Victimizing.

As expected, identity predicted victimizing responses beyond control variables and SES. Step 1 showed that smokers who were more dependent on nicotine, and who had been smoking for a longer time perceived themselves more as victims in response to the ban. On top of these effects, smokers with a weaker nonsmoker group-identity perceived themselves more as victims in response to the smoking ban (Step 2). We found no effects of smoker identities in Step 2, and no significant interactions in Step 3 (all *p*s > .10). Intention to quit did not predict victimizing responses in Step 4, and the association between nonsmoker group-identity and victimizing remained significant.

Active quitting.

As expected, identity explained active quitting responses beyond control variables. Step 1 showed that the lower smokers' nicotine dependence, the more they showed active quitting responses to the smoking ban. Also, controlling for these effects, smokers with stronger nonsmoker self- and group-identities showed more active quitting responses

4 In addition, in the context of these other variables a suppression effect was found, suggesting that older age at smoking onset marginally predicts more rejecting responses. However, the zero-order correlation between age at smoking onset and rejecting is small and nonsignificant ($r = .08$, $p = .29$).

Table 3. Explaining degree of responses to the smoking ban by T1 variables: Hierarchical linear regression analyses ($N = 188$).

	Rejecting				Victimizing			
Predictor	*Model 1*	*Model 2*	*Model 3*	*Model 4*	*Model 1*	*Model 2*	*Model 3*	*Model 4*
Gender (female)	-.09	-.06	-.07	-.04	.10	.13^{+}	.12^{+}	.12^{+}
Age at smoking onset	.15*	.15*	.16*	.13^{+}	-.07	-.06	-.04	-.03
Years smoked	.01	-.04	-.03	-.06	.17*	.14^{+}	.16*	.16*
Nicotine dependence	.22**	.12	.14^{+}	.13^{+}	.28**	.21**	.21**	.21**
SES (average)[i]	-.15^{+}	-.18*	-.17^{+}	-.15^{+}	-.09	-.11	-.09	-.09
SES (high)[i]	-.17*	-.18*	-.21*	-.21*	-.09	-.09	-.05	-.05
Smoker self-identity		-.05	-.18	-.19		.06	-.03	-.03
Nonsmoker self-identity		-.30**	-.30^{+}	-.12		-.11	-.26^{+}	-.30^{+}
Smoker group-identity		.09	.10	.15		-.04	-.23	-.24
Nonsmoker group-identity		-.16*	-.20	-.21^{+}		-.18*	-.28*	-.27*
Smoker self-identity * SES (average)[i]			.08	.10			.03	.03
Smoker self-identity * SES (high)[i]			.07	.07			.13	.13
Nonsmoker self-identity * SES (average)[i]			-.15	-.18			.15	.16
Nonsmoker self-identity * SES (high)[i]			.11	.05			.09	.10
Smoker group-identity * SES (average)[i]			-.03	-.07			.13	.14
Smoker group-identity * SES (high)[i]			.05	.01			.13	.14
Nonsmoker group-identity * SES (average)[i]			.10	.11			< .01	-.002
Nonsmoker group-identity * SES (high)[i]			.02	-.01			.15	.15
Intention to quit (T1)				-.23**				.05

Note. Values in the table are βs. Rejecting $R^2 = .09$ ($p < .01$) for Step 1, $\Delta R^2 = .15$ for Step 2 ($p < .001$), $\Delta R^2 = .04$ for Step 3 ($p = .38$), $\Delta R^2 = .03$ for Step 4 ($p < .01$); Victimizing $R^2 = .18$ ($p < .001$) for Step 1, $\Delta R^2 = .06$ for Step 2 ($p < .01$), $\Delta R^2 = .03$ for Step 3 ($p = .52$), $\Delta R^2 < .01$ for Step 4 ($p = .58$).

i. Compared with the reference category 'lower SES'.

$^{+}$ $p < .10$; * $p < .05$; ** $p < .01$

Table 3. Explaining degree of responses to the smoking ban by T1 variables: Hierarchical linear regression analyses ($N = 188$) (*cont.*).

	Active quitting				Socially conscious smoking			
Predictor	***Model 1***	***Model 2***	***Model 3***	***Model 4***	***Model 1***	***Model 2***	***Model 3***	***Model 4***
Gender (female)	.05	.03	.03	-.02	.06	.03	.05	.01
Age at smoking onset	-.01	-.01	-.04	.003	.04	.04	.03	.06
Years smoked	-.08	-.05	-.08	-.04	.04	.09	.09	.12
Nicotine dependence	-.20**	-.12	-.12	-.10	-.35**	-.26**	-.28**	-.27**
SES (average)[i]	-.04	-.02	-.06	-.09	-.06	-.05	-.02	-.04
SES (high)[i]	-.07	-.06	-.11	-.11	-.06	-.06	-.02	-.02
Smoker self-identity		.19*	.22	.24		-.04	.12	.13
Nonsmoker self-identity		.40**	.62**	.37*		.21*	.14	-.05
Smoker group-identity		-.12	.20	.12		-.02	-.18	-.23
Nonsmoker group-identity		.17*	.24+	.24*		.12	.13	.13
Smoker self-identity * SES (average)[i]			.002	-.03			-.09	-.11
Smoker self-identity * SES (high)[i]			-.06	-.05			-.13	-.13
Nonsmoker self-identity * SES (average)[i]			-.19	-.16			.11	.13
Nonsmoker self-identity * SES (high)[i]			-.14	-.05			-.01	.06
Smoker group-identity * SES (average)[i]			-.21*	-.16			.11	.15
Smoker group-identity * SES (high)[i]			-.25*	-.18			.10	.15
Nonsmoker group-identity * SES (average)[i]			.02	.01			.03	.02
Nonsmoker group-identity * SES (high)[i]			-.12	-.09			-.06	-.03
Intention to quit (T1)				.32**				.25**

Note. Values in the table are βs. Active quitting $R^2 = .05$ ($p = .15$) for Step 1, $\Delta R^2 = .22$ for Step 2 ($p < .001$), $\Delta R^2 = .04$ for Step 3 ($p = .26$), $\Delta R^2 = .06$ for Step 4 ($p < .001$); Socially conscious smoking $R^2 = .13$ ($p < .001$) for Step 1, $\Delta R^2 = .08$ for Step 2 ($p < .01$), $\Delta R^2 = .02$ for Step 3 ($p = .74$), $\Delta R^2 = .04$ for Step 4 ($p < .01$).

i. Compared with the reference category 'lower SES'.

$^+ p < .10$; * $p < .05$; ** $p < .01$

(Step 2).[5] We found no significant effects of smoker identities in Step 2, and no significant interactions in Step 3 (all *p*s > .10).[6] Step 4 showed that smokers with stronger intentions to quit showed stronger active quitting responses. Importantly, nonsmoker self- and group-identity remained significant predictors of active quitting when intention to quit was controlled for.

Socially conscious smoking.

As expected, identity explained socially conscious smoking responses beyond control variables. Step 1 showed that weaker nicotine dependence significantly predicted stronger socially conscious smoking responses to the smoking ban. Controlling for this, stronger nonsmoker self-identity significantly predicted stronger socially conscious smoking responses. We found no effects of smoker identities in Step 2, and no significant interactions in Step 3 (all *p*s > .10). Step 4 showed that smokers with stronger intentions to quit showed stronger socially conscious smoking responses. In conclusion, nonsmoker identity predicted intention to quit, quit attempts and responses to the smoking ban. Results further suggested that nonsmoker self-identity (T1) might be associated with intention to quit (T2) through intention to quit at T1.

DISCUSSION

The present study examined the role of identity factors and SES (educational level) in smoking behavior and responses to a smoking ban. To the best of our knowledge, this

5 In addition, in the context of these other variables a suppression effect was found, suggesting that smokers with a stronger smoker self-identity showed more active quitting responses to the smoking ban. This contrary effect changed into the expected direction and became nonsignificant when the analysis was repeated with only smoker self-identity as predictor of active quitting (controlled for control variables and SES): smoker self-identity $b = -0.08$, $p = .69$. Further, the zero-order correlation between smoker self-identity and active quitting is in the expected direction ($r = -.13$).

6 In addition, in the context of these other variables two suppression effects were found, leading the smoker group-identity*SES (average vs. lower) and smoker group-identity*SES (higher vs. lower) interactions to take on unusual forms. Specifically, whereas the smoker group-identity*SES (average vs. lower) interaction effect was significant ($F(1,169) = 4.02$, $p = .047$, $\Delta R^2 = .02$), simple slopes among lower and average SES smokers were nonsignificant (*p*s > .10). The interaction effect became nonsignificant when the analysis was repeated with only the smoker group-identity*SES interaction as predictor of intention to quit in Step 3 (controlled for gender, SES, age at smoking onset, years smoked, nicotine dependence, and identity variables), $F(1,176) = 0.65$, $p = .42$, $\Delta R^2 < .01$. Also, whereas the smoker group-identity*SES (higher vs. lower) interaction effect was significant ($F(1,169) = 4.37$, $p = .04$, $\Delta R^2 = .02$), the simple slope among higher SES smokers was only marginally significant ($b = -0.38$, $p = .099$) and the simple slope among lower SES smokers was nonsignificant ($p > .10$). The interaction effect became nonsignificant when the analysis was repeated with only the smoker group-identity*SES interaction as predictor of intention to quit in Step 3 (controlled for gender, SES, age at smoking onset, years smoked, nicotine dependence, and identity variables), $F(1,176) = 0.97$, $p = .33$, $\Delta R^2 < .01$.

was the first study in which the effects of smoker and nonsmoker self- and group-identity were both included and compared.

The results confirmed the importance of identity in changes in smoking behavior and responses to the smoking ban. Importantly, the results suggest that *nonsmoker* identity is more important than smoker identity in explaining smoking behavior and responses to the smoking ban. In other words, the extent to which smokers identify with nonsmoking and nonsmokers is more important than their identification with smoking and smokers. As we took into account other important influences in the analyses, we showed that *nonsmoker* identity was consistently associated with smoking behavior and responses to the smoking ban above and beyond standard predictors. In line with the hypotheses, results show that stronger nonsmoker self-identity was meaningfully associated with stronger intentions to quit smoking, both at the same time and one year later, and a higher likelihood of quit attempts one year later. Thus, when being a nonsmoker fits with how smokers see themselves they have stronger intentions to quit and are more likely to attempt to quit. Importantly, nonsmoker self-identity did not predict intention to quit (at T2) anymore when intention to quit (T1) was included in the model. Results might imply that nonsmoker self-identity (T1) is associated with intentions to quit one year later (T2) through intentions to quit (T1). One would indeed expect intention to quit to play a major role in predicting subsequent intentions to quit. Importantly, the direction of the relationship between identity and intention cannot be established in the current data. Alternatively, nonsmoker self-identity might be a component of a latent intention construct, in which case intention (T1) would predict intention one year later (T2) through nonsmoker self-identity (T1). Results further showed that SES moderated the association between nonsmoker self-identity and intention to quit (T1), such that the association between nonsmoker self-identity and intention to quit was stronger among lower SES smokers than among higher SES smokers. More generally intentions to quit were stronger among smokers with average or higher SES than among lower SES smokers. Results thus suggest that higher SES smokers have relatively strong intentions to quit smoking in general, and that their intentions to quit become somewhat stronger if they can picture themselves more as nonsmokers. However, lower SES smokers have relatively weak intentions to quit in general, but intentions to quit become much stronger if they can picture themselves as nonsmokers. Notably, nonsmoker self-identity was stronger among higher SES smokers than among lower SES smokers, suggesting that intentions to quit might be similar among lower and higher SES smokers if their nonsmoker self-identities were to be equally strong. Also, on top of the effects of background variables, results showed a major role of *nonsmoker* identity in predicting responses to the smoking ban. Smokers with weaker nonsmoker identities responded more negatively to the ban, whereas smokers with stronger nonsmoker identities responded more positively to the ban. Specifically, smokers with stronger

nonsmoker self-identities showed less rejecting responses (i.e., feeling cornered by the ban and resisting complying) and more active quitting (i.e., becoming motivated to quit smoking) and socially conscious smoking responses (i.e., agreeing to refrain from smoking in areas where smoking is not allowed) to the smoking ban, and smokers with stronger nonsmoker group-identities showed less rejecting and victimizing responses (i.e., feeling unable to quit because of perceived addiction to smoking) and more active quitting responses. Also, smokers with stronger intentions to quit showed weaker rejecting responses, and stronger active quitting and socially conscious smoking responses, but intention to quit was not significantly related to victimizing responses. Importantly, stronger nonsmoker self- and group-identities were still significantly associated with active quitting responses in the final model with intention to quit (T1) included. We further found that lower SES smokers showed more rejecting and victimizing responses to the smoking ban than higher SES smokers. To summarize the findings, nonsmoker identity predicted intentions to quit, quit attempts, and responses to the smoking ban, and the influence of nonsmoker self-identity on intention to quit differed between lower and higher SES smokers. Also, nonsmoker self-identity (T1) seemed to predict intentions to quit and quit attempts one year later (T2) through intentions to quit (T1).

Our findings relate to work by Van den Putte and colleagues (2009) who showed that a stronger quitter self-identity predicts stronger intentions to quit and a higher likelihood of quit attempts. In addition, we showed that the influence of nonsmoker self-identity on intention to quit is moderated by SES, showing that the association between nonsmoker self-identity and intention to quit was stronger among lower SES smokers than among higher SES smokers. As smoking is more prevalent among lower than higher SES groups (e.g., Reid et al., 2010), it is not surprising that the effects of identity differ in strength between lower and higher SES smokers. One explanation could be that lower SES smokers may perceive nonsmoking as part of a range of health promoting behaviors that does not fit within their social environment or social class. In line with this idea, a study among members of ethnic minority groups showed that healthy behaviors were perceived by ethnic minority members as characteristics of the higher status outgroup, whereas unhealthy behaviors were perceived as characterizing the lower status ingroup (Oyserman, Fryberg, & Yoder, 2007; see also Fordham & Ogbu, 1986). *How* SES influences the effects of identity is a question in need of further investigation. Both in our study and in the work by Van den Putte and colleagues, identity predicted intentions to quit and quit attempts even when controlling for other important influences. Identity, then, seems to be a relatively stable factor that influences behavior, in other words, smokers behave in ways that fit with who they (believe they) are (West, 2006). Extending previous research, we compared the effects of smoker and nonsmoker self- and group-identity directly. In contrast to previous work (e.g., Høie et al., 2010; Moan & Rise, 2005; Tombor et al., 2013; Van den Putte et al., 2009), we did not find that smoker identity predicted

intention to quit or quit attempts. However, smoker identity might have been predictive in these previous studies because *nonsmoker* identity was often not measured. In one study in which smoker and quitter self-identity were compared, quitter self-identity predicted both intention to quit and quit attempts, whereas smoker self-identity predicted quit attempts but not intention to quit (Van den Putte et al., 2009). Overall, these findings may suggest that the possible self as a nonsmoker is even more important in predicting smoking behavior than the current self as a smoker (see Markus & Nurius, 1986). Similarly, in contrast to findings from three experimental studies suggesting that stronger *smoker* self- or group-identities lead to adverse responses to antismoking measures or norms (Falomir-Pichastor & Invernizzi, 1999; Falomir-Pichastor et al., 2013; Freeman et al., 2001), our results instead suggest that weaker *nonsmoker* self- and group-identities are more important in predicting adverse responses to the smoking ban. Thus, smokers who responded negatively to the smoking ban by rejecting or victimizing did not seem to defend their strong *smoker* identity, but rather did or could not picture themselves as *nonsmokers* or as part of the group of nonsmokers. Again, *nonsmoker* identity was not measured in the three experimental studies. Possibly, effects of smoker identity would have been weaker if nonsmoker identity was measured. In sum, we conclude that nonsmoker identity in and of itself (all other things remaining the same) affects intentions and attempts to quit and responses to the smoking ban.

We found different effects of nonsmoker self-identity and group-identity, suggesting that the two are fundamentally different. Indeed, smokers may identify with nonsmoking as a behavior (i.e., self-identification as a nonsmoker), or nonsmokers as a group (i.e., group-identification as part of the group of nonsmokers) or both (Turner et al., 1987). Results showed that whereas only nonsmoker *self*-identity predicted intention to quit and quit attempts, both nonsmoker *self*- and *group*-identity predicted responses to the smoking ban, suggesting that smokers' responses to smoking bans might be more influenced by social factors than their smoking behavior. The current study extended qualitative work by Van der Heiden and colleagues (2013) by validating four responses to smoking bans using a quantitative measure. Thus, the four responses that were previously found could be reliably distinguished and predicted among a general sample of daily smokers.

The study also has limitations. First, the sample might not have been representative of all smokers due to (selective) attrition and the study would have benefited from a larger sample size. Specifically, smoking seemed to be more important to those participants who completed both surveys than to those who only completed (part of) the first questionnaire. For example, continued participants had significantly stronger smoker identities than drop-outs at T1. Also, successful quitters were not included in the analyses, because the subsample of fourteen successful quitters was considered too small to draw any meaningful conclusions about this group. However, this may suggest that the

sample of the present study may be those who are less open to change their smoking, a group highly relevant for policy efforts. More insight into identity processes within this group of smokers would appear to be of particular importance. Second, the number of items used to measure group-identity and each of the responses to the smoking ban was relatively small. The measure of responses might be further explored in future research. Related to this, responses to the smoking ban were measured four years after instigation of the ban. It is important to note that the smoking ban was still in effect when data were collected, and therefore participants responded to the current situation rather than to a historic event. While participants may have been ex-smokers between the introduction of the smoking ban and data collection, the fact that participants were smokers at the time when data were collected is what is most important for the current research questions. Third, as the current study has only two waves, we cannot exclude history and maturation biases. Importantly, longitudinal designs with more waves will also shed more light on the direction of associations between nonsmoker identity and intention to quit, thus, whether intention changes as a result of changes in identity, or the other way around. Fourth, as self-report measures were used, we cannot be sure whether participants had actually quit at T2. Biochemical validation would have allowed for more reliable measurement of smoking behavior. Finally, although the Theory of Planned Behavior (TPB; Ajzen, 1991) has been widely applied, we did not control for TPB constructs in our analyses. However, previous work has already established the independent importance of smoker self- and group-identity in predicting intention to quit, reduced smoking and quit attempts when TPB constructs were controlled for (Høie et al., 2010; Moan & Rise, 2005, 2006; Van den Putte et al., 2009; see also Rise, Sheeran, & Hukkelberg, 2010 for a meta-analysis).

Despite these limitations, we believe that if the current results can be replicated in future studies, this would suggest that smoking cessation interventions may profit from components that focus on identity change. However, for this it would be necessary to do additional experimental research on how one can assist smokers to make nonsmoking and the group of nonsmokers more important to 'who they are'. As smokers may identify with nonsmoking on a self-identity level and/or group-identity level (Turner et al., 1987), approaches to strengthen nonsmoker identity can focus on self-identity, group-identity or both. Based on 'possible selves' theory (Barreto & Frazier, 2012; Markus & Nurius, 1986), one possibility to strengthen nonsmoker identity may be to have smokers repeatedly write about themselves as (part of the group of) nonsmokers (Parry, Fowkes, & Thomson, 2001; Pennebaker, 2004, 2010). Also, imagery could be used to increase identification with nonsmoking (Prochaska et al., 1992). These techniques may help smokers with weaker intentions to quit to picture themselves as nonsmokers and move towards quitting smoking, whereas it may reinforce nonsmoker identity in smokers who already intend to quit smoking. Experimental studies should examine the effectiveness of such

methods in smokers with weaker and stronger quitting intentions. Similarly, if the results with regard to responses to the smoking ban can be replicated, other antismoking measures might be expected to be more effective if they are tailored to the identity of smokers, thereby focusing on *nonsmoker* identities. For example, antismoking measures could make use of questions that invite smokers to think about the self as a nonsmoker or as part of the group of nonsmokers in order to help them to move towards nonsmoking. Finally, results suggest that antismoking measures might be more effective if SES is taken into consideration.

In sum, results suggest that identity is important in smoking behavior and responses to antismoking measures. A better understanding of the role of identity in quitting smoking is needed to allow development of policies and interventions that may help more smokers to quit. Future research on the basis of the current findings should provide more insight into the different mechanisms by which smoker and nonsmoker identity are associated with intention and attempts to quit, as well as responses to smoking bans and other antismoking measures. It should also provide more insight into how SES influences these processes, and where and in what form effective intervention opportunities exist. The current work suggests that future research should explore the effectiveness of tailoring antismoking measures to smokers' identity, thereby taking the role of *nonsmoker* identities into account.

REFERENCES

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50,* 179–211.

Barreto, M. L. & Frazier, L. D. (2012). Coping with life events through possible selves. *Journal of Applied Social Psychology, 42,* 1785-1810.

Dijkstra, A., Bakker, M., De Vries, H. (1997). Subtypes within a sample of precontemplating smokers: A preliminary extension of the stages of change. *Addictive Behaviors, 22*(3), 327-337.

Falomir-Pichastor, J. M. & Invernizzi, F. (1999). The role of social influence and smoker identity in resistance to smoking cessation. *Swiss Journal of Psychology, 58*(2), 73-84.

Falomir-Pichastor, J. M., Mugny, G., Berent, J., Pereira, A., & Krasteva, D. (2013). Antismoking norm and smokers' antismoking attitudes: The interplay between personal and group-based self-esteem. *European Journal of Social Psychology, 43,* 192-200.

Fordham, S. & Ogbu, J. U. (1986). Black students' school success: Coping with the 'burden of acting White'. *The Urban Review, 18*(3), 176-206.

Freeman, M. A., Hennessy, E. V., & Marzullo, D. M. (2001). Defensive evaluation of antismoking messages among college-age smokers: The role of possible selves. *Health Psychology, 20*(6), 424-433.

Gibbons, F. X. & Eggleston, T. J. (1996). Smoker networks and the "typical smoker": A prospective analysis of smoking cessation. *Health Psychology, 15*(6), 469-477.

Giskes, K., Kunst, A. E., Ariza, C., Benach, J., Borrell, C., Helmert, U., … Mackenbach, J. P. (2007). Applying an equity lens to tobacco-control policies and their uptake in six Western-European countries. *Journal of Public Health Policy, 28,* 261-280.

Hayes, A. F. (2013). Introduction to mediation, moderation, and conditional process analysis: A regression-based approach. New York: Guilford Press.

Heatherton, T. F., Kozlowksi, L. T., Frecker, R. C., & Fagerström, K. O. (1991). The Fagerström Test for Nicotine Dependence – a revision of the Fagerström Tolerance Questionnaire. *British Journal of Addiction, 86*(9), 1119-1127.

Honjo, K., Tsutsumi, A., Kawachi, I., & Kawakami, N. (2006). What accounts for the relationship between social class and smoking cessation? Results of a path analysis. *Social Science & Medicine, 62,* 317-328.

Høie, M., Moan, I. S., & Rise, J. (2010). An extended version of the theory of planned behaviour: Prediction of intentions to quit smoking using past behaviour as moderator. *Addiction Research and Theory, 18*(5), 572-585.

Katainen, A. (2011). Smoking and workers' autonomy: A qualitative study on smoking practices in manual work. *Health: An Interdisciplinary Journal for the Social Study of Health, Illness and Medicine, 16*(2), 134-150.

Kearney, M. H. & O'Sullivan, J. (2003). Identity shifts as turning points in health behavior change. *Western Journal of Nursing Research, 25*(2), 134-152.

Markus, H. & Nurius, P. (1986). Possible selves. *American Psychologist, 41*,954-969.

Moan, I. S. & Rise, J. (2005). Quitting smoking: Applying an extended version of the theory of planned behavior to predict intention and behavior. *Journal of Applied Biobehavioral Research, 10*(1), 39-68.

Moan, I. S. & Rise, J. (2006). Predicting smoking reduction among adolescents using an extended version of the theory of planned behavior. *Psychology and Health, 21*(6), 717-738.

Nagelhout, G. E., Willemsen, M. C., & De Vries, H. (2010). The population impact of smoke-free workplace and hospitality industry legislation on smoking behaviour: Findings from a national population survey. *Addiction, 106,* 816-823.

Oyserman, D., Fryberg, S. A., & Yoder, N. (2007). Identity-based motivation and health. *Journal of Personality and Social Psychology, 93*(6), 1011-1027.

Parry, O., Fowkes, F. G. R. & Thomson, C. (2001). Accounts of quitting among older ex-smokers with smoking-related disease. *Journal of Health Psychology, 6,* 481-493.

Pennebaker, J. W. (2004). Theories, therapies, and taxpayers: On the complexities of the expressive writing paradigm. *Clinical Psychology: Science and Practice, 11*, 138-142.

Prochaska, J. O., DiClemente, C. C., & Norcross, J. C. (1992). In search of how people change: Applications to addictive behaviors. *American Psychologist, 47*(9), 1102-1114.

Reid, J. L., Hammond, D., Boudreau, C., Fong, G.T., & Siahpush, M. (2010). Socioeconomic disparities in quit intentions, quit attempts and smoking abstinence among smokers in four western countries: Findings from the international tobacco control four country survey. *Nicotine & Tobacco Research,* 12 (S1): S20-33.

Rise, J., Sheeran, P., & Hukkelberg, S. (2010). The role of self-identity in the Theory of Planned Behavior: A meta-analysis. *Journal of Applied Social Psychology, 40*(5), 1085-1105.

Schaap, M. M., & Kunst, A. E., (2009). Monitoring of socio-economic inequalities in smoking: Learning from the experiences of recent scientific studies. *Public Health, 123,* 103-109.

Shadel, W. G., & Mermelstein, R. (1996). Individual differences in self-concept among smokers attempting to quit: Validation and predictive utility of measures of the smoker self-concept and abstainer self-concept. *Annals of Behavioral Medicine, 18*(3), 151-156.

Shadel, W. G., Mermelstein, R., & Borrelli, B. (1996). Self-concept changes over time in cognitive-behavioral treatment for smoking cessation. *Addictive Behaviors, 21*(5)*,* 659-663.

Sorensen, G., Emmons, K., Stoddard, A. M., Linnen, L., & Avrunin, J. (2002). Do social influences contribute to occupational differences in quitting smoking and attitude toward quitting? *American Journal of Health Promotion, 16*(3), 135-141.

Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin, W. G. & Worchel, S. (Eds.), *The social psychology of intergroup relations*. Monterey: Brooks/Cole Publishing Company.

Tajfel, H., & Turner, J. C. (1986). The social identity theory of intergroup behavior. In Worchel, S. & Austin, W. G. (Eds.), *The psychology of intergroup relations* (pp. 7–24). Chicago: Nelson-Hall.

Tombor, I., Shahab, L., Brown, J., & West, R. (2013). Positive smoker identity as a barrier to quitting smoking: Findings from a national survey of smokers in England. *Drug and Alcohol Dependence, 133*, 740-745.

Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). Rediscovering the social group: A self-categorization Theory. Oxford: Basil Blackwell.

Van den Putte, M. C., Yzer, B., Willemsen, M. C., & De Bruijn, G. (2009). The effects of smoking self-identity and quitting self-identity on attempts to quit smoking. *Health Psychology, 28*(5)*,* 535-544.

Van der Heiden, S., Gebhardt, W. A., Willemsen, M. C., Nagelhout, G. E., & Dijkstra, A. (2013). Behavioural and psychological responses of lower educated smokers to smoke-free legislation in Dutch hospitality venues: A qualitative study. *Psychology & Health, 28*(1), 49-66.

Velicer, W. F., Cumming, G., Fava, J. L., Rossi, J. S., Prochaska, J. O., & Johnson, J. (2008). Theory testing using quantitative predictions of effect size. *Applied Psychology: An International Review, 57*(4), 589-608.

West, R. (2006). Theory of addiction. Oxford: Blackwell, Addiction Press.

Wiltshire, S., Bancroft, A., Parry, O., & Amos, A. (2003). 'I came back here and started smoking again': perceptions and experiences of quitting among disadvantages smokers. *Health Education Research, 18*(3), 292-303.

APPENDIX A: RESPONSES TO THE SMOKING BAN SCALES

We conducted a principle component analysis (PCA) with orthogonal rotation (varimax) on nine items constructed to measure the four responses to the smoking ban. The KMO statistic had a value of .76, indicating adequate sample size. Bartlett's test of sphericity indicated that correlations between variables were sufficiently large to perform a PCA, $\chi^2(36) = 584.08$, $p < .001$. Before rotation, 3 components had eigenvalues over Kaiser's criterion of 1, and 4 components had eigenvalues over Jolliffe's criterion of .7. After rotation, 4 components had eigenvalues over 1, and in combination explained 76% of the variance. The scree plot showed an inflexion that justified retaining 4 components. Taken together, a 4-component solution seemed adequate. The items that clustered on the same component (based on highest rotated factor loadings) suggested that the four components represented rejecting, victimizing, active quitting and socially conscious smoking responses to the smoking ban. The item 'I think it sensible that smoking is not allowed in some places' was not included in a scale, as it loaded on both the rejecting (reversed) and socially conscious smoking component.

APPENDIX B: ATTRITION ANALYSES

Table 1A. Means and standard deviations of responders and drop-outs on ordinal and interval T1 variables, accompanied by *t*-statistics testing differences between groups.

	M (SD)		
Variable	**Drop-outs** *n* = 597-897	**Responders** *n* = 185-189	***t*-statistic**
Age	34.36 (13.81)	41.74 (13.20)	$t(1080) = -6.66$, $p < .001$
Age at smoking onset	16.57 (3.80)	16.40 (3.55)	$t(1023) = 0.57$, $p = .57$
Years smoked	17.68 (12.81)	24.78 (12.87)	$t(1023) = -6.86$, $p < .001$
Nicotine dependence	4.39 (2.40)	4.74 (2.46)	$t(933) = -1.77$, $p = .08$
Smoker self-identity	3.07 (.85)	3.28 (.87)	$t(806) = -3.01$, $p < .01$
Nonsmoker self-identity	2.91 (.91)	2.80 (.87)	$t(766) = 1.51$, $p = .13$
Smoker group-identity	3.08 (1.28)	3.48 (1.07)	$t(359.71) = -4.31$, $p < .001$
Nonsmoker group-identity	2.76 (.99)	2.52 (.92)	$t(766) = 3.01$, $p < .01$
Intention to quit	4.87 (2.00)	4.58 (2.20)	$t(273.19) = 1.69$, $p = .09$

Note. For each variable analyses were performed on all participants for whom data on this particular variable was available.

Table 1B. Means and standard deviations of drop-outs and responders on categorical T1 variables, accompanied by χ^2-statistics testing differences between groups.

		% of group (N), standardized residual if deviation is significant		
Variable	***Categories***	**Drop-outs**	**Responders**	**χ^2-statistic**
Previous quit attempts (lifetime)	Yes	79% (572)	80% (152)	$\chi^2(1) = .24$, $p = .62$
	No	21% (154)	20% (37)	
Quit attempts since smoking ban	Yes	76% (683)	63% (120)	$\chi^2(1) = 12.21$, $p < .001$, Cramer's $V = .11$
	No	24% (218)	37% (69)**	
Gender	Male	45% (409)	32% (60)*	$\chi^2(1) = 11.87$, $p < .01$, Cramer's $V = .10$
	Female	55% (492)	68% (129)*	
SES	Lower	32% (240)	32% (61)	$\chi^2(2) = 6.68$, $p = .04$, Cramer's $V = .08$
	Average	43% (325)	34% (64)	
	Higher	26% (195)	34% (64)	

Note. For each variable attrition analyses were performed on all participants for whom data on this particular variable was available.

* deviation from the expected cell count, $p < .05$; ** deviation from the expected cell count, $p < .01$

APPENDIX C. CORRELATIONS BETWEEN VARIABLES USED IN THE REGRESSION ANALYSES

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Intention to quit T1															
2 Intention to quit (T2)	.62**														
3 Quit attempts between T1 and T2[i] (T2)	.31**	.41**													
4 Rejecting (T2)	-.40**	-.29**	-.16*												
5 Victimizing (T2)	-.17*	-.34**	-.05	.11											
6 Active quitting (T2)	.47**	.42**	.18*	-.46**	-.35**										
7 Socially conscious smoking (T2)	.32**	.22**	.08	-.38**	-.13^{+}	.36**									
8 Gender (female)	.17*	.11	.06	-.07	.11	.04	.03								
9 SES[ii]	.10	.18*	.09	-.16*	-.20**	.02	-.03	-.04							
10 Age at smoking onset	-.03	.05	.03	.08	-.17**	.04	.12	-.04	.22**						
11 Years smoked	-.26**	-.20**	-.08	.08	.25**	-.10	-.02	-.09	-.24**	-.13+					
12 Nicotine dependence	-.17*	-.14^{+}	.002	.20**	.35**	-.20**	-.34**	.08	-.22**	-.25**	.18*				
13 Smoker self-identity	-.29**	-.24**	-.07	.19**	.28**	-.13	-.24**	-.09	-.14^{+}	-.12^{+}	.32**	.40**			
14 Nonsmoker self-identity	.55**	.46**	.28**	-.40**	-.30**	.46**	.33**	.05	.18*	.08	-.22**	-.27**	-.40**		
15 Smoker group-identity	-.10	-.11	-.03	.16*	.08	-.19**	-.16*	.03	.17*	.004	-.01	.18*	.38**	-.19*	
16 Nonsmoker group-identity	.21**	.14^{+}	.10	-.30**	-.27**	.35**	.28**	.09	-.03	.09	-.04	-.18*	-.32**	.44**	-.26**

Note. All variables were assessed at T1 unless indicated otherwise.

i. 0 = no quit attempts, 1 = one or more quit attempts.

ii. For correlations involving SES, Spearman's correlations were used instead of Pearson's correlations.

$^{+}$ $p < .10$ * $p < .05$ (two-tailed); ** $p < .01$ (two-tailed)

CHAPTER 3

SOCIO-ECONOMIC STATUS AND SMOKING: A CROSS-SECTIONAL EXPLORATION OF SOCIAL SUPPORT AND IDENTITY FACTORS

Eline Meijer, Winifred A. Gebhardt, Colette van Laar, Ramin Kawous, and Sarah C. A. M. Beijk

This chapter was published in *Social Science & Medicine*. Meijer, E., Gebhardt, W. A., Van Laar, C., Kawous, R., & Beijk, S. C. (2016). Socio-economic status in relation to smoking: The role of (expected and desired) social support and quitter identity. *Social Science & Medicine*, *162*, 41-49.

DOI: 10.1016/j.socscimed.2016.06.022

ABSTRACT

Rationale

Smoking behavior differs substantially between lower and higher socioeconomic status (SES) groups. Previous research shows that social support for quitting may be more available to higher SES smokers, and higher SES smokers may have stronger nonsmoker self-identities (i.e., can see themselves more as nonsmokers).
Objective. To investigate how SES influences smoking behavior, taking the role of identity processes and social support into account.

Method

A cross-sectional online survey study was conducted among 387 daily smokers from lower, middle and higher SES groups in the Netherlands in 2014. Educational level was used as an indicator of SES. Expected and desired social support for quitting smoking, expected exclusion from the social network when quitting, identity factors and intention to quit were measured.

Results

Smokers from all SES backgrounds desired to receive positive social support if they would quit smoking. Lower SES smokers expected to receive more negative and practical support than middle or higher SES smokers. There were no significant differences between SES groups for almost all identity measures, nor on intention to quit. Above and beyond other important influences such as nicotine-dependence, results showed that smokers regardless of SES who expected to receive more positive support tended to have stronger intentions to quit. Moreover, smokers who could see themselves more as being quitters (quitter self-identity) and perceived themselves less as smokers (smoker self-identity), as well as smokers who felt more positive about nonsmokers (nonsmoker group-identity) had stronger intentions to quit. No significant interactions with SES were found.

Conclusion

The results suggest that developing ways to stimulate the social environment to provide adequate support for smokers who intend to quit, and developing ways to strengthen identification with quitting in smokers may help smokers to quit successfully. Findings further suggest that the possible-self as a quitter is more important than the current-self as a smoker.

Keywords: socio-economic status/educational level; smoking cessation; intention to quit; social support; identity; groups.

Smoking behavior differs substantially between lower and higher socioeconomic status (SES) groups, with smoking being more prevalent and persistent among lower SES groups (e.g., Férnandez et al., 2006, Pisinger, Aadahl, Toft, & Jørgensen, 2011; Reid, Hammond, Boudreau, Fong, & Shiapush, 2010, Wetter et al., 2005). In the Netherlands in 2014, 29% of lower-educated people smoked, compared to 17% of those with higher-education (Statistics Netherlands, 2016a). Moreover, social support for quitting is less available to lower than higher SES smokers (Pisinger et al., 2011; Sorensen, Emmons, Stoddard, Linnen, & Avrunin, 2002). Meanwhile, receiving social support for quitting is associated with stronger quit-intentions and self-efficacy, adaptive coping and quit-success (e.g. Hooper, Baker, & McNutt, 2013; Rayens, Hahn, & Nicholson, 2011; Rice et al., 1996; Sorensen et al., 2002). Specifically, positive support (i.e., positive, supportive behaviors such as complimenting on being abstinent) is associated with successful quit-attempts, whereas negative support (i.e., negative, unsupportive behaviors such as complaining about smoking) predicts relapse (Lawhon, Humfleet, Hall, Munoz, & Reus, 2009; Rice et. al., 1996; Roski, Schmid, & Lando, 1996). Interestingly, however, Rice and colleagues showed that negative support at specific time-points in the quit process benefitted smoking cardiovascular patients. Overall, previous work suggests that social support helps smokers quit, but that social support is less available to lower than higher SES smokers.

Similarly, quitting smoking likely entails more negative social consequences for lower SES smokers, while for higher SES smokers the opposite seems to apply. Higher SES smokers experience more social pressure to quit than lower SES smokers, and are more likely to become socially marginalized with continued smoking (Christakis & Fowler, 2008; Royce, Corbett, Sorensen, & Ockene, 1997; Sorensen et al., 2002). Conversely, a qualitative study among blue-collar workers showed that quitting smoking was perceived as 'leaving the gang', and that group members attempted evoke relapse to keep the quitter within the group (Katainen, 2011). This can be explained by social identity theory, which states that people derive an important part of their identity from their membership in groups, i.e. social identity (Tajfel & Turner, 1979). People are more inclined to provide social support to someone they socially identify with, and recipients of social support seem to benefit more from this support when they share identity with the support provider (Haslam, Reicher, & Levine, 2012; Walsh, Muldoon, Gallagher, & Fortune, 2015). The workers probably did not perceive the quitter as sharing common social identity as smokers anymore, which made them less inclined to support quitting. Group membership more generally has been described as a 'social cure', because it can promote health and well-being when individuals are identified with the group, and the group has health-promoting social norms (e.g., Jetten, Haslam, Haslam, Dingle, & Jones, 2014). Regarding smoking, those who are less socially connected are indeed more likely to smoke and (if smoking) to smoke more heavily, and people from lower SES backgrounds appear to have fewer and

less satisfying relationships than higher SES people (Cutler & Lleras-Muney, 2010). As such, lower SES people may have fewer health-promoting social resources that prevent them from smoking.

Previous work shows that social support and identity may enhance one another. In addition to the contribution of identity to support, receiving social support can increase identification with behaviors or groups (e.g., Gleibs, Haslam, Haslam, & Jones, 2011; Walsh et al., 2015). For example, availability of support is associated with use of helpful strategies to cope with changes in group membership, which subsequently increase identification with new social groups (Amiot, Terry, Wirawan, & Grice, 2010). Regarding social identities in recovery from addiction, the Social Identity Model of Cessation Maintenance (SIMCM; Frings & Albery, 2015) and the Social Identity Model of Recovery (SIMOR; Best et al., 2015) outline the social environment's contribution to activating and strengthening recovery identities. According to SIMCM, therapeutic groups may activate recovery identities, and individuals may derive self-esteem and self-efficacy from group membership. Recovery identities can be strengthened when groups provide social support for cessation maintenance, and encourage recovering individuals to behave corresponding with pro-recovery group norms. Similarly, SIMOR states that recovery identities are strengthened when shared with other members of social groups who favor recovery. When individuals become increasingly identified with the group - and internalize its norms and values - the new social identity and its associated norms will guide subsequent behavior. Eventually, behavior becomes increasingly dependent on rooted identities and increasingly independent of social norms. In sum, social environments can shape identities through support and social norms.

Applying these ideas to smoking and SES suggests that different responses to smoking and quitting between SES-groups (e.g., more positive responses to smoking and quitting in lower and higher SES groups, respectively) are likely to be associated with different self-perceptions among lower and higher SES smokers. Moreover, work on identity compatibility states that new social identities are more easily adopted when compatible with existing identities (Iyer, Jetten, Tsivrikos, Postmes, & Haslam, 2009). The new identity, as part of the nonsmokers group, likely is more compatible with existing identities of higher than lower SES smokers, such that higher SES smokers more easily become nonsmokers. Correspondingly, higher SES smokers appear to have stronger "nonsmoker" self-identities (i.e., picture themselves as nonsmokers) than lower SES smokers (Meijer, Gebhardt, Dijkstra, Willemsen, & Van Laar, 2015). Differences in smoking behavior between lower and higher SES smokers may also contribute to identity differences. In addition to social identification with groups (i.e. group-identity), individuals may identify with behaviors (i.e. self-identity), and Prime theory states that deeply embedded self-identities are reliable predictors of behavior (West, 2006). Moreover, behavior may in turn contribute to self-conceptualization. A qualitative study among

ex-smokers showed a reciprocal relationship between smoking as meaningful behavior ('occupation') and identity (Luck & Beagan, 2014). In the quitting process, changes in smoking as occupation (e.g., replacing smoking by new activities) supported the development of a nonsmoker identity, and changes in identity led to changes in occupation. Other work shows that both self-identity and group-identity of smokers (i.e., identification with smoking, nonsmoking and quitting as behaviors and the groups of smokers and nonsmokers) predict smoking behavior (e.g. Høie, Moan, Rise, 2010; Meijer et al., 2015; Moan & Rise, 2005; Moan & Rise, 2006; Van den Putte, Yzer, Willemsen, & De Bruijn, 2009). Our previous work suggested that nonsmoker identities are more important predictors of quitting than smoker identities. Interestingly, while nonsmoker identities were less developed among lower SES smokers, for lower SES smokers the *association* between nonsmoker identities and quit-intentions was stronger (Meijer et al., 2015).

The current study investigates how SES influences smoking behavior, taking identity and social support into account. We conducted a cross-sectional study, as part of a larger longitudinal experimental study, with 387 higher, middle and lower SES smokers as determined by educational level. Educational level is often used to measure SES in smoking research, and has been found to be a better indicator of risk of smoking than income and occupational class (Schaap & Kunst, 2009; Wetter et al., 2005). Extending previous research, a comprehensive measure of identity was used, allowing for the comparison of smoker, nonsmoker and quitter self- and group-identity. Whereas identity research on smoking often uses one-dimensional measures of group-identity (e.g., Meijer et al., 2015, Moan & Rise, 2005; 2006), growing evidence suggest that multi-dimensional assessment of group-identity is more appropriate (e.g., Cameron, 2004). Indeed, whereas stronger group commitment is associated with weaker quit-intentions, group self-esteem and self-categorization (i.e., perceiving the self as group member) is not (Høie et al., 2010). We therefore used a three-dimensional measure of group-identity, and assessed ties (i.e., perceptions of similarity to- and belongingness with group members), centrality (i.e., cognitive centrality of the group), and affect (i.e., feelings associated with group membership; Cameron, 2004). We also assessed three types of expected social support (i.e., positive, negative, practical) for quitting, rather than measuring general support. Research questions (RQ) were:

1. Do SES-groups differ in expected support, social network, and expected exclusion (RQ1)? We hypothesized that lower SES smokers would expect more negative support, and less positive and practical support (RQ1a), have more smokers and fewer nonsmokers in their network (RQ1b), and expect more social exclusion after quitting (RQ1c) than middle and higher SES smokers. We further expected that associations between SES and expected social support and exclusion would be mediated by the number of smokers and nonsmokers in the network (RQ1d).

2. Which types of social support (i.e., positive, negative, practical) are desired most by the three SES-groups (RQ2)?
3. Do SES-groups differ in identity (RQ3)? We hypothesized that lower SES smokers would have weaker quitter and nonsmoker identities, and stronger smoker identities, than middle and higher SES smokers.
4. Are expected support and identity associated with quit-intentions (RQ4,5)? We hypothesized that stronger expected positive and practical support, and weaker expected negative support would be associated with stronger quit-intentions (RQ4a), and that stronger quitter and nonsmoker identities, and weaker smoker identities would be associated with stronger quit-intentions (RQ5a). We expected these relations to differ between lower and higher SES smokers (RQ4b, 5b).

METHOD

Participants, design and procedure

Participants were recruited in the Netherlands between April-September 2014 through a national newspaper with around 88,000 subscribers ($n = 80$), previous research participation ($n = 77$, response rate 42%), the researchers' social networks/other participants ($n = 58$), social media ($n = 54$), at train stations ($n = 31$), at a college of higher education ($n = 22$), and other media ($n = 65$). The study was part of a longitudinal experimental study with a pretest (T0), experimental manipulations of quitter identity (strengthened quitter identity/control) and social support for quitting smoking (support present/absent/control), a posttest (T1), and one-month and six-month follow-ups (T2 and T3). The current paper reports on the pretest. The subsequent manipulations that occurred in later waves and their effects will be reported elsewhere. Participants (aged ≥ 18) who smoked daily at recruitment, and completed the T0 measure were included in the analyses ($N = 387$, $n_{\text{lower SES}} = 74$, $n_{\text{middle SES}} = 121$, $n_{\text{higher SES}} = 192$). In total, 552 people met inclusion criteria and started to fill out the survey, of whom 387 completed the T0 questionnaire (70%). Compared to the Dutch population, people with higher SES (49% vs. 27%), aged 40-65 (45% vs. 35%) and women (63% vs. 50%) were overrepresented (Statistics Netherlands, 2016b; 2016c). After giving informed consent, participants completed the online questionnaire. Three gift coupons of €100 and six of €50 were randomly distributed among participants who completed the T0, T1 and T2 measurements. Leiden University's Ethical Board approved the procedure (9175373144).

Measures

All scales were coded such that higher scores indicate more of the concept.

Predictor variables.

Demographics.

We asked participants' age, gender, number of years smoking and age at smoking onset (two missings, 0.52%).

SES.

Highest attained educational level was used to measure SES. Answer categories ranged from [1] 'no education' – [8] 'university', and [9] 'other, namely…' (recoded). SES was recoded into lower (no education [one participant], primary school, pre-vocational secondary education, lower level vocational education), middle (middle level vocational education, higher-level, pre-university secondary education) and higher SES (higher professional or university education).

Nicotine-dependence.

Nicotine-dependence was measured with the six-item Fagerström Test for Nicotine Dependence (FTND; Heatherton, Kozlowksi, Frecker, & Fagerström, 1991). We asked participants to provide the specific number of cigarettes per day (15 missings, 3.88%). Possible scores on the FTND range from zero to 10.

Expected social support.

Based on the 20-item Partner Interaction Questionnaire (PIQ; Cohen & Lichtenstein, 1990), we assessed how often participants *expected* the people around them to provide positive (e.g., 'Compliment me on not smoking') and negative social support (e.g., 'Comment that smoking is a dirty habit') with ten items each, [1] 'never' – [5] 'very often' (see Appendix A for full list of items). We replaced the two negative support items 'Express doubt about your ability to quit' (similar to 'Comment on your lack of willpower') and 'Refuse to clean up your cigarette butts' (less relevant to people without partner) by 'Tell me I'll be disappointed with myself if I would smoke' and 'Comment that smoking may have dangerous consequences for my health', respectively. Based on principal component analysis, three scales were constructed by calculating for each participant the mean score across the scale items: negative support (eight items, e.g., 'Criticize my smoking if I would smoke', $\alpha = .88$), positive support (seven items, e.g., 'Compliment me on not smoking', $\alpha = .88$), and practical support (five items, e.g., 'Participate in an activity that keeps me from smoking', $\alpha = .88$; see Appendix B).

Identity.

Answer categories were [1] 'completely disagree' – [5] 'completely agree' for all identity concepts. Scales were made by calculating for each participant the mean score across the scale items.

Smoker self-identity.

We used the five-item Smoker Self-Concept Scale to measure smoker self-identity (α = .85), e.g. 'Smoking is part of "who I am"' (Shadel & Mermelstein, 1996). We added 'I like being a smoker' (adapted from Tombor, Shahab, Brown, & West, 2013), and 'Continuing to smoke fits with who I am' and 'Continuing to smoke fits with how I want to live' (both adapted from Van den Putte et al., 2009).

Nonsmoker self-identity.

We used the four-item Abstainer Self-Concept Scale to measure nonsmoker self-identity (α = .87), e.g. 'I am able to see myself as a nonsmoker' (Shadel & Mermelstein, 1996). The item 'It is easy to imagine myself as a nonsmoker' (resembles 'I am able to see myself as a nonsmoker') was replaced with three items derived from the Smoker Self-Concept Scale (Shadel & Mermelstein, 1996): 'Nonsmoking is part of my personality (or can be part of my personality)', 'Nonsmoking 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 nonsmoker'. We also added 'I would like to be a nonsmoker' (adapted from Tombor et al., 2013).

Quitter self-identity.

We adapted the four-item Abstainer Self-Concept Scale (Shadel & Mermelstein, 1996) to measure *quitter self-identity* (α = .85), e.g. 'I am able to see myself as a quitter'. We replaced 'It is easy to imagine myself as a quitter' by four items parallel to those added for nonsmoker self-identity.

Smoker group-identity.

We measured aspects of *smoker group-identity* by adapting Cameron's twelve-item group identification scale (2004), which measures *ingroup ties* (e.g. 'I have a lot in common with other smokers', α = .67), *centrality* (e.g. 'The fact that I am part of the group of smokers rarely enters my mind' (reversed), α = .67) and *ingroup affect* (e.g. 'In general, I am glad that I am part of the group of smokers', α = .78) with four items each. The item 'I find it difficult to form a bond with other smokers' (ties) was replaced in the scale with 'I feel at home in the company of other smokers' (original ties scale, α = .62).

Nonsmoker group-identity.

Similarly, we measured *nonsmoker group ties* (α = .71), *centrality* (α = .73), and *group affect* (α = .73) with four items each. The item 'I find it difficult to form a bond with nonsmokers' (ties) was replaced with 'I feel at home in the company of nonsmokers' (original ties scale, α = .63).

Quitter group-identity.

Similarly, we measured *quitter group ties* (α = .68), *centrality* (α = .79), and *group affect* (α = .73) with four items each. The item 'I find it difficult to form a bond with quitters' (ties) was replaced with 'I feel at home in the company of quitters' (original ties scale, α = .53).

Outcome variables.

Expected social support.

See 'Predictor variables'.

Desired social support.

Participants selected the three types of social support for quitting smoking they would desire from the people important to them, out of the twenty pre-described types of negative, positive and practical social support used for expected social support.

Smokers and nonsmokers in the social network.

Two items assessed how many of the people in the participants' social environment are *smokers* and *nonsmokers*, [1] 'very few' – [7] 'almost everyone'.

Expected exclusion.

Three items measured expected exclusion from the social network after quitting (α = .75), i.e. 'If I quit smoking, I will fall outside the group of people around me/people around me will find me less nice/I will be shut out by the people around me', [1] 'completely disagree' – [7] 'completely agree'. A scale was made by calculating for each participant the mean score across the scale items.

Quit-intention.

Participants were asked when (if at all) they intended to quit smoking: 'I intend to [1] 'quit within one month'; [2] 'quit within six months'; [3] 'quit within two years'; [4] 'quit within five years'; [5] 'quit within 10 years'; [6] 'quit in the future, but not within 10 years'; [7] 'always remain smoking, but reduce number of cigarettes per day; or [8] 'always remain smoking, and not reduce number of cigarettes per day" (Dijkstra, Bakker, & De Vries, 1997). This variable was recoded, such that higher scores indicated stronger quit-intention.

Statistical analyses

Before the main analyses, we used ANOVAs to examine SES differences in background variables. Hochberg's (equal variances) and Games-Howell (unequal variances) post-hoc tests for unequal group-sizes were examined when ANOVAs yielded significant results.

Furthermore, Pearson's correlations were computed between variables used in regression analyses.

For RQ1a-c (SES and expected support, social network, and exclusion) we used ANCOVAs with age at smoking onset, years smoked, and nicotine-dependence as covariates, provided that the assumption of homogeneity of regression slopes was met. Significant main effects of SES were followed by analyses of estimated marginal means, with Bonferroni correction. Moreover, to examine mediation of the relation between SES and support by the social network (RQ1d), four sets of bootstrapping analyses (5000 samples) for estimating direct and indirect effects (Preacher & Hayes, 2004) were conducted with independent variables either SES (lower vs. higher) or SES (middle vs. higher) (SES middle vs. higher and SES lower vs. higher as covariates, respectively); as mediators the number of smokers and nonsmokers; as covariates age at smoking onset, years smoked, and nicotine dependence; and as dependent variable either expected negative support or expected practical support.

For RQ2 (SES and desired support), Kruskal-Wallis tests were used as desired support variables had a limited range of possible values and some were skewed. For RQ3 (SES and identity) ANCOVAs were performed as for RQ1a-c.

Finally, for RQ4 and RQ5 (prediction of quit-intention by expected support and identity, and moderation by SES) two hierarchical regression analyses were performed, with two SES dummy variables (lower/middle vs. higher) and control variables (gender, age at smoking onset, years smoked, nicotine-dependence) entered in Step 1. We controlled for years smoked (and not for the strongly correlated variable 'age', $r = .95$, $p < .001$) as the number of years smoked most likely reflected the social network of the respondent better than age alone. In the first analysis, expected support variables were entered in Step 2 (RQa3; Step 2A in Table 4), and interactions between expected support and SES (lower vs. higher) were entered in Step 3A (RQ4b). In the second analysis, identity concepts were entered in Step 2 (RQ5a; Step 2B in Table 4), and interactions between identity and SES (lower vs. higher) were entered in Step 3B (RQ5b). Predictor variables were centered. We ensured that assumptions of all analyses were met. Analyses were performed in IBM SPSS Statistics (version 23.0).

RESULTS

Preliminary analyses

Before performing the main analyses we assessed differences between SES-groups and calculated correlations. Middle SES smokers were significantly younger and had been smoking significantly fewer years than lower and higher SES smokers (see Table 1). Also, middle SES smokers were significantly younger at smoking onset than higher SES smokers.

Lower SES smokers smoked significantly more cigarettes per day than higher SES smokers, and were significantly more nicotine-dependent than middle and higher SES smokers.

Table 1. Differences between lower, middle and higher SES participants in background variables: Chi-square test and One-Way ANOVAs (N = 372-387).

		Frequency (Expected count) / M (SD)			
Characteristic		*Lower SES (n = 71-74)*	*Middle SES (n = 115-121)*	*Higher SES (n = 186-192)*	***Chi-square test***
Gender	Male	28(28)	43(45)	74(72)	$\chi^2(2) = .29$, $p = .86$, $V = .03$
	Female	46(46)	78(76)	118(120)	
					Post-hoc tests
Age		49.61(17.67)	37.86(16.93)	46.42(16.23)	Middle < Lower, Higher**
Age at smoking onset		16.18(4.49)	16.13(2.50)	17.17(4.24)	Middle < Higher*
Years smoked		32.14(17.61)	19.94(16.28)	27.73(16.76)	Middle < Lower, Higher**
Number of cigarettes per day		17.97(8.29)	15.34(6.99)	14.63(8.77)	Lower > Higher**; Lower > Middle$^+$
Physical nicotine-dependence		4.65(2.26)	3.76(2.26)	3.31(2.37)	Lower > Middle*; Lower > Higher**

$^+p < .10$; $*p < .05$; $**p < .01$

Expected support and identity were weakly correlated. Expected positive support correlated positively with nonsmoker and quitter self-identity, nonsmoker group-identity affect, and quitter group-identity ties and affect, and had a marginally significant negative correlation with smoker group-identity affect (see Table 2). Expected negative support correlated positively with smoker, nonsmoker, and quitter group-identity centrality, and negatively with smoker group-identity affect. Finally, expected practical support correlated positively with quitter self-identity.

Social support and the social network (RQ1)

Expected social support (RQ1a).

As hypothesized, SES had a marginal effect on negative support, such that lower SES smokers expected more negative support than higher SES smokers, $F(2,364) = 2.41$, $p = .09$, $\eta_p^2 = .01$ (η_p^2 = partial eta squared; see Table 3). However, lower SES smokers also expected marginally more practical support than higher SES smokers, $F(2,364) = 2.63$, $p = .07$, $\eta_p^2 = .01$. No significant group-differences in expected positive support were found, $F(2,364) = .17$, $p = .84$, $\eta_p^2 < .01$. The hypothesis that lower SES smokers expect less positive and practical support was not confirmed.

Table 2. Correlations between variables used in the regression analyses (N = 372-387).

Variable	1	2	3	4	5	6	7	8	9	10
1. Quit-intention	1									
2. Gender (female)	.16**	1								
3. SES (lower)[i]	.00	.00	1							
4. SES (middle)[i]	.01	.03	-.33**	1						
5. Age at smoking onset	-.01	-.02	-.06	-.09	1					
6. Years smoked	-.36**	-.13*	.17**	-.24**	-.14**	1				
7. Nicotine-dependence	-.07	-.03	.19**	.02	-.22**	.31**	1			
8. Expected positive support	.11*	.03	.01	.05	-.06	-.04	.12*	1		
9. Expected negative support	.03	-.06	.15**	-.05	-.05	.16**	.15**	.50**	1	
10. Expected practical support	.07	.05	.12*	.02	-.08	.01	.13*	.64**	.42**	1
11. Smoker self-identity	-.41**	-.14**	.08	-.02	-.08	.23**	.18**	-.02	.05	-.02
12. Nonsmoker self-identity	.58**	.10+	-.07	.01	.06	-.31**	-.12*	.16**	.03	.08
13. Quitter self-identity	.62**	.06	-.02	-.03	.04	-.28**	-.07	.20**	.07	.10*
14. Smoker group-identity ties	.01	-.05	-.12*	.06	-.03	-.18**	.12*	.07	.01	.02
15. Smoker group-identity centrality	.07	.03	.03	-.04	.05	.13*	.14**	.00	.15**	.03
16. Smoker group-identity affect	-.34**	-.20**	-.05	.08+	.07	-.10*	-.11*	-.09+	-.12*	-.04
17. Nonsmoker group-identity ties	.14**	.08	-.11*	.04	.14**	-.16**	-.17**	.07	-.07	-.06
18. Nonsmoker group-identity centrality	.20**	.18**	.12*	-.06	.04	.11*	.07	.04	.19**	.05
19. Nonsmoker group-identity affect	.46**	.20**	-.04	-.05	.01	-.13**	.03	.13**	.06	.04
20. Quitter group-identity ties	.27**	.05	.09+	-.01	.03	-.03	.00	.12*	.06	.07
21. Quitter group-identity centrality	.25**	.09+	.15**	-.01	.00	.05	.06	.04	.18**	.04
22. Quitter group-identity affect	.45**	.22**	.01	.00	-.04	-.08	.10*	.16**	.09+	.04

Variable	11	12	13	14	15	16	17	18	19	20	21
11. Smoker self-identity	1										
12. Nonsmoker self-identity	-.52**	1									
13. Quitter self-identity	-.40**	.83**	1								
14. Smoker group-identity ties	.29**	-.11*	-.05	1							
15. Smoker group-identity centrality	.13*	-.01	.05	.21**	1						
16. Smoker group-identity affect	.43**	-.45**	-.37**	.29**	-.12*	1					
17. Nonsmoker group-identity ties	-.25**	.30**	.23**	-.06	-.03	-.16**	1				
18. Nonsmoker group-identity centrality	-.10	.23**	.24**	.01	.55**	-.36**	.02	1			
19. Nonsmoker group-identity affect	-.41**	.54**	.46**	-.07	.10+	-.58**	.32**	.27**	1		
20. Quitter group-identity ties	-.22**	.34**	.35**	.00	.09+	-.23**	.41**	.20**	.30**	1	
21. Quitter group-identity centrality	-.08	.30**	.32**	.01	.44**	-.37**	.05	.71**	.28**	.30**	1
22. Quitter group-identity affect	-.41**	.55**	.52**	-.10*	.12*	-.58**	.28**	.26**	.75**	.37**	.32**

i. Compared with the reference category 'higher SES'.

+$p < .10$; *$p < .05$; **$p < .01$

Table 3. Differences between lower, middle and higher SES participants in outcome variables: ANCOVAs (N = 370-385) and Kruskal-Wallis tests (N = 387).

Outcome		*M(SD)*				*Effects of covariates: b(SE)*		
		Lower SES (n = 71-74)	*Middle SES (n = 113-119)*	*Higher SES (n = 186-192)*	***Estimated marginal means***	*Age at smoking onset*	*Years smoked*	*Nicotine-dependence*
Expected social support	Positive	3.61(0.74)	3.64(0.60)	3.56(0.7)	No sign. Differences	-.01(.01)	.00(.002)	.03(.02)*
	Negative	3.16(0.75)	2.84(0.79)	2.85(0.80)	Lower > Higher^{+}	.00(.01)	.01(.003)*	.03(.02)
	Practical	3.01(0.94)	2.83(0.83)	2.68(0.83)	Lower > Higher^{+}	-.01(.01)	.00(.003)	.04(.02)$^{+}$
Social network	Smokers	3.54(1.57)	4.34(1.47)	3.37(1.49)	Middle > Higher**	-.05(.02)**	-.05(.004)**	.04(.03)
	Nonsmokers	4.75(1.22)	4.34(1.32)	5.17(1.16)	Higher > Lower*	.03(.02)$^{+}$	.02(.004)**	-.03(.03)
					Higher > Middle**			
Expected exclusion[a]		1.55(0.86)	1.59(0.82)	1.57(0.87)	No sign. Differences	-.01(.01)	.00(.003)	
Desired social support	Positive	1.78(1.02)	1.64(0.96)	1.64(0.97)	-	-	-	-
	Negative	0.35(0.61)	0.31(0.62)	0.32(0.63)	-	-	-	-
	Practical	0.74(0.94)	0.94(0.93)	0.89(0.93)	-	-	-	-
Smoker self-identity		2.85(0.83)	2.69(0.79)	2.72(0.76)	No sign. Differences	.00(.01)	.01(.003)**	.03(.02)$^{+}$
Nonsmoker self-identity[b]		3.02(0.92)	3.14(0.75)	3.13(0.78)	No sign. Differences	.01(.01)	-	-.03(.02)$^{+}$
Quitter self-identity[b]		3.00(0.92)	3.00(0.81)	3.02(0.76)	No sign. Differences	.00(.01)	-	-.02(.02)
Smoker group-identity	Ties	3.05(0.58)	3.30(0.67)	3.27(0.68)	Higher > Lower*	.00(.01)	-.01(.002)**	.06(.02)**
	Centrality[a]	2.46(0.57)	2.37(0.78)	2.43(0.81)	No sign. Differences	.01(.01)	.01(.002)**	-
	Affect	2.64(0.82)	2.83(0.73)	2.69(0.86)	No sign. Differences	.01(.01)	.00(.002)	
Nonsmoker group-identity	Ties	3.07(0.72)	3.30(0.60)	3.27(0.68)	No sign. Differences	.02(.01)$^{+}$	.00(.002)*	-.03(.02)$^{+}$
	Centrality	2.62(0.64)	2.34(0.78)	2.40(0.82)	No sign. Differences	.01(.01)	.00(.003)	.01(.02)
	Affect	3.48(0.83)	3.50(0.62)	3.60(0.75)	No sign. Differences	.00(.01)	-.01(.002)**	.04(.02)*
Quitter group-identity	Ties	3.08(0.63)	2.97(0.66)	2.94(0.71)	No sign. Differences	.01(.01)	.00(.002)	.00(.02)
	Centrality[b]	2.69(0.67)	2.42(0.78)	2.36(0.83)	Lower > Higher*	.01(.01)	-	.01(.02)
	Affect[b]	3.52(0.82)	3.50(0.67)	3.52(0.72)	No sign. Differences	.00(.01)		.03(.02)$^{+}$
Quit-intention[a]		4.89(2.51)	5.03(1.91)	4.82(2.39)	No sign. Differences	-.02(.03)	-	-.08(.15)

*Note.*Kruskal-Wallis tests were used for desired support.

a. Not controlled for nicotine-dependence, because the assumption of homogeneous regression slopes was not met.

b. Not controlled for years smoked, because the assumption of homogeneous regression slopes was not met.

$^{+}p < .10$; *$p < .05$; **$p < .01$

Smokers and nonsmokers in the social network (RQ1b).

As hypothesized, higher SES smokers had more nonsmokers in their network than lower or middle SES smokers, $F(2,364) = 9.66$, $p < .001$, $\eta_p^2 = .05$ (see Table 3). The hypothesis that lower SES smokers have more smokers in their network was not confirmed, but middle SES smokers had more smokers in their social network than higher SES smokers, $F(2,364) = 5.05$, $p < .01$, $\eta_p^2 = .03$.

Expected exclusion (RQ1c).

Unexpectedly, we found no significant differences between SES-groups in expected exclusion when quitting smoking, $F(2,380) = .02$, $p = .98$, $\eta_p^2 < .01$(see Table 3). Overall, expected exclusion was low. The hypothesis that lower SES smokers expect more exclusion was not confirmed.

Mediation analyses (RQ1d).

Unexpectedly, the number of smokers and nonsmokers in the network did not mediate the effects of SES on expected negative and practical support. All analyses indicated with 95% confidence intervals that the total indirect effects were nonsignificant, with point estimates for total indirect effects ranging from -0.02 to -0.01 and 95% BCa (bias-corrected and accelerated; see Efron, 1987) confidence intervals for total indirect effects all including 0. The hypothesis that associations between support and quit-intention is mediated by the social network was not confirmed.

Desired social support for quitting smoking (RQ2)

We found no significant group-differences in desire for positive ($H(2) = 1.38$, $p = .50$), negative ($H(2) = 0.49$, $p = .79$) and practical support ($H(2) = 2.93$, $p = .23$; see Table 3). Across SES-groups, positive support items were selected most and negative support items were selected least (see Appendix A for counts).

Identity (RQ3)

Unexpectedly, higher SES smokers had stronger ties with smokers than lower SES smokers, $F(2,364) = 3.95$, $p = .02$, $\eta_p^2 = .02$ (see Table 3). Also, the group of quitters was significantly more central to the identity of lower than higher SES smokers. There were no significant differences between SES-groups on other identity measures (all *p*s >.10). The hypotheses about SES differences in identity were not confirmed.

Table 4. Explaining quit-intention: Hierarchical linear regression analyses ($N = 369$).

	Predictor	*b(SE)*	B
Step 1	SES (lower)[i]	0.22(.30)	.04
	SES (middle)[i]	-0.31(.26)	-.06
	Gender (female)	0.62(.23)**	.13**
	Age at smoking onset	-0.04(.03)	-.07
	Years smoked	-0.05(.01)**	-.40**
	Nicotine-dependence	0.04(.05)	.04
Step 2A	Expected negative support	0.15(.16)	.05
	Expected positive support	0.40(.22)$^{+}$	.12^{+}
	Expected practical support	-0.12(.17)	-0.05
Step 2B	Smoker self-identity	-0.36(.15)*	-.12*
	Nonsmoker self-identity	0.18(.22)	.06
	Quitter self-identity	0.96(.21)**	0.34**
	Smoker group-identity ties	0.21(.15)	.06
	Smoker group-identity centrality	0.16(.15)	.05
	Smoker group-identity affect	-0.08(.16)	-.03
	Nonsmoker group-identity ties	-0.40(.16)*	-.12*
	Nonsmoker group-identity centrality	-0.09(.18)	-.03
	Nonsmoker group-identity affect	0.42(.19)*	.13*
	Quitter group-identity ties	0.25(.16)	.07
	Quitter group-identity centrality	0.10(.17)	.04
	Quitter group-identity affect	0.14(.21)	.05

Note. $R^2 = .17$ ($p < .001$) for Step 1; $\Delta R^2 = .02$ for Step 2A ($p = .06$); $\Delta R^2 = .32$ for Step 2B ($p < .001$).
i. Compared with reference category 'higher SES'.
$^{+}p < .10$; *$p < .05$; **$p < .01$

Quit-intention (RQ4 and RQ5)

Female smokers and smokers who had been smoking fewer years had significantly stronger quit-intentions (See Table 4, Step 1; Table 2 for correlations). Unexpectedly, SES did not predict quit-intentions. As hypothesized, stronger expected positive support tended to predict stronger quit-intentions (RQ4a; see Table 4, Step 2A). Furthermore, and as expected, identity significantly predicted quit-intention beyond effects of controls and SES, and associations were in hypothesized directions (RQ5a; see Table 4, Step 2B). Quitter self-identity was strongly positively associated with quit-intentions. Also, stronger (positive) nonsmoker group-identity affect and weaker smoker self-identity predicted stronger quit-intentions. No significant interactions were found between either expected support (RQ4b; Step 3A $\Delta R^2 < .01$, $p = .86$) or identity concepts and SES (RQ5b; Step 3B $\Delta R^2 = .01$, $p = .88$; interactions all ps >.18; not shown), disconfirming the hypotheses about moderation by SES. Moreover, a contrary effect was found, such that

smokers with stronger ties with nonsmokers had weaker quit-intentions (β = .12, p = .01). The regression coefficient changed into the expected direction when the analysis was repeated with control variables and SES in Step 1 and only nonsmoker group-identity ties in Step 2B (β = .08, p = .11), suggesting that the contrary effect emerged because of suppression. Results held also when sample source was further controlled for.

DISCUSSION

This study examined the role of identity factors and social support in the relationship between SES and smoking behavior among daily smokers. Marginally significant effects of SES on expected support suggested that lower SES smokers expected to receive more negative and practical support than higher SES smokers (RQ1a). Higher SES smokers had more nonsmokers in their network than other SES-groups, and middle SES smokers had more smokers in their network than higher SES smokers (RQ1b). Expected exclusion after quitting did not differ significantly between SES-groups (RQ1c). As such, lower SES smokers expected more negative reactions if quitting than the other SES-groups, but believed that they would still belong in their social network as much as middle or higher SES smokers. Number of smokers and nonsmokers in the network did not mediate the relation between SES and support (RQ1d). Furthermore, all SES-groups most desired receiving positive support for quitting (RQ2), and smokers who expected to receive more positive support tended to have stronger quit-intentions (RQ4a), suggesting that smokers' expectations of their social environment's responses are important. Unexpectedly, there were no significant differences between SES-groups on most identity measures (RQ3). However, results confirmed the importance of identity across SES-groups for quit-intentions beyond controls. Specifically, smokers who could see themselves as quitters, who did not identify strongly with smoking, and felt positive about nonsmokers had stronger quit-intentions. Quitter and nonsmoker identities were more important in explaining quit-intentions than smoker identities (RQ5a). Unexpectedly, SES was not associated with quit-intentions, nor moderated relations between expected support (RQ4b) or identity (RQ5b) and quit-intentions. Finally, identity and expected support correlated weakly: Overall, stronger nonsmoker and quitter identities were associated with stronger expected positive or practical support, whereas stronger smoker identities were associated with weaker positive, and stronger negative expected support. Interestingly, stronger centrality of the group of smokers, nonsmokers, or quitters was associated with stronger expected negative support.

Our work extends previous work that examined general support by measuring specific types of support. The marginally significant finding that lower SES smokers expected more negative support than higher SES smokers corresponds with work by Sorensen

and colleagues (2002), who showed that *general* support was less available to lower SES smokers (see also Katainen, 2011). Importantly, negative support can be harmful (Lawhon et al., 2009; Roski et al., 1996) and might be interpreted as negative reactions from the social environment (e.g., questioning ability to quit). We further found that lower SES smokers expected more practical support, and found no significant differences between SES-groups in expected exclusion after quitting. Notably, previous work explored actual group processes, whereas we focused on *expectations*. Although expected exclusion did not differ significantly between SES-groups, previous work suggests that an actual quit-attempt may be embraced more by higher than lower SES groups (Pisinger et al., 2011; Sorensen et al., 2002). Speculatively, lower SES smokers may underestimate negative social consequences of quitting, and may be unprepared if they encounter resistance. Also, exclusion when quitting may occur in some but not other lower SES groups. Relatedly, people are often part of multiple groups each with their own group norms (e.g., Phua, 2013; Tarrant & Butler, 2011). Finally, correlations between identity and support corresponded with work suggesting that support may shape identity (e.g., Frings & Albery, 2015), and that *perceptions* of the social environment also contribute to identity (Ascencio & Burke, 2011). In addition, identity may affect perceptions of others (Derks, Stedehouder, & Ito, 2015). We further found that smokers who spent more time thinking about whether they belong with smokers, nonsmokers or quitters expected more negative support, possibly suggesting that they were more concerned about group membership and responses from people around them.

Importantly, we replicated previous findings (Meijer et al., 2015; Van den Putte et al., 2009) showing that the 'current-self' as smoker was less important for quit-intentions than the 'possible-self' (see Markus & Nurius, 1986) as quitter: Although stronger smoker self-identity was associated with weaker quit-intentions, the positive association between quitter self-identity and quit-intentions was almost three times as strong. Similarly, whereas nonsmoker group-identity was associated with quit-intentions, smoker group-identity was not. Furthermore, results suggest that the 'transitional' quitter self-identity (Vangeli & West, 2012) is more important for quit-intentions than the more 'ultimate' self-identity as a (permanent) nonsmoker. However, *quitter* group-identity was not associated with quit-intentions, but stronger *nonsmoker* group-identity was. Nonsmoker group-identity may be more important than quitter group-identity because the quitters group is likely more abstract than the nonsmokers group. Correspondingly, when the 'group of quitters' was made concrete for smokers in a group smoking-cessation program (i.e. other quitters in the group) identification with other quitters seemed very important for quitting smoking (Vangeli & West, 2012). Also, as ties with nonsmokers and centrality of the nonsmoker group-identity were not significantly associated with quit-intentions, the emotional component of identification with nonsmokers appeared to be most important in our study (Ellemers, Kortekaas, & Ouwerkerk,

1999). Work on *smoker* group-identity showed that group commitment (related to ties) was most important for quit-intentions (Høie et al., 2010). As such, positive feelings about nonsmokers may make smokers more inclined to quit, whereas stronger connections with smokers may hinder quitting. However, we directly compared effects of smoker and nonsmoker group-identity, and did not find that smoker group-identity was associated with quit-intentions.

In contrast to our previous finding that the association between nonsmoker identity and quit-intention was stronger among lower than higher SES smokers (Meijer et al., 2015), we here did not find such moderation by SES, and we found no significant differences between SES-groups for most identity measures. In addition, strength of quit-intentions appeared similar in the SES-groups. This is in line with previous work showing that although lower SES smokers were less successful in *staying* abstinent, there were no differences in quit-attempts (Kotz & West, 2009). Nevertheless, other studies have found that higher SES smokers are more inclined to quit than lower SES smokers (e.g., Reid et al., 2010).

Limitations

The current study has limitations. An alternative explanation for the discrepant findings about SES and quit-intention could be that the sample in our previous study was more balanced in terms of SES. The underrepresentation of lower SES smokers is a limitation of the current sample, and younger and male smokers were also underrepresented. Relatedly, a more comprehensive measure of SES including income or occupation in addition to education could have been used (Schaap, Van Agt, & Kunst, 2008). On the other hand, educational level is often used as a measure of SES in smoking research, and has been found to be a better indicator of risk of smoking than income and occupational class (Schaap & Kunst, 2009). Furthermore, although we established associations between identity and quit-intention, and expected positive support and quit-intention were related, the causal direction of these associations could not be examined cross-sectionally. Experimental and longitudinal studies with more measurements are needed to explore the direction of these relationships. Similarly, the idea that lower SES smokers may underestimate negative social consequences of quitting needs further investigation. Importantly, a strength of the current study is that it provided insight into what specific types of social support lower and higher SES smokers expect and desire to receive if they were to quit smoking. In addition, effects of smoker, nonsmoker and quitter identities among lower and higher SES smokers could be compared.

Conclusions

The current study showed that smokers who expect to receive more positive support for quitting and smokers who identified more strongly with quitting have stronger quit-

intentions. Corresponding with previous research, quitter and nonsmoker identities appeared more important for quit-intentions than smoker identities, suggesting that 'who I will become' is more important than 'who I am'. If the findings can be replicated, future research should explore how the social environment of smokers intending to quit can be stimulated to provide the type of social support that smokers find helpful. Furthermore, developing ways to strengthen identification with quitting will likely help more smokers quit successfully.

REFERENCES

Amiot, C. E., Terry, D. J., Wirawan, D., & Grice, T. A. (2010). Changes in social identities over time: The role of coping and adaptation processes. *British Journal of Social Psychology*, *49*(4), 803-826.

Asencio, E. K., & Burke, P. J. (2011). Does incarceration change the criminal identity? A synthesis of labeling and identity theory perceptions on identity change. *Sociological Perspectives, 54*(2), 163-182. DOI:10.1525/sop.2011.54.2.163.

Best, D., Beckwith, M., Haslam, C., Alexander Haslam, S. A., Jetten, J., Mawson, E., & Lubman, D. I. (2015). Overcoming alcohol and other drug addiction as a process of social identity transition: The Social Identity Model of Recovery (SIMOR). *Addiction Research & Theory*, 1-13. DOI:10.3109/16066359.2015.1075980.

Cameron, J. E. (2004). A three factor model of social identity. *Self and Identity, 3*, 239–262. DOI:10.1080/13576500444000047.

Christakis, N. A., & Fowler, J. H. (2008). The collective dynamics of smoking in a large social network. *New England Journal of Medicine, 358*(21), 2249-2258. DOI:10.1056/NEJMsa0706154.

Cohen, S., & Lichtenstein, E. (1990). Partner behaviors that support quitting smoking. *Journal of Consulting and Clinical Psychology, 58*(3), 304-309. DOI:10.13072/midss.466.

Cutler, D. M., & Lleras-Muney, A. (2010). Understanding differences in health behavior by education. *Journal of Health Economics, 29*(1), 1-28. DOI:10.1016/j.jhealeco.2009.10.003.

Derks, B., Stedehouder, J., & Ito, T. A. (2015). Social identity modifies face perception: an ERP study of social categorization. *SCAN, 10,* 672-679. DOI:0.1093/scan/nsu107.

Dijkstra, A., Bakker, M., De Vries, H. (1997). Subtypes within a sample of precontemplating smokers: A preliminary extension of the stages of change. *Addictive Behaviors, 22*(3), 327-337. DOI:10.1093/her/15.4.423.

Ellemers, N., Kortekaas, P., & J. W. Ouwerkerk (1999). Self-categorisation, commitment to the group and group self-esteem as related but distinct aspects of social identity. *European Journal of Social Psychology, 29*, 371-389. DOI:10.1002/(SICI)1099-0992(199903/05)29:2/3 < 371::AID-EJSP932>3.0.CO;2-U.

Férnandez, E., Schiaffino, A., Borrell, C., Benach, J., Ariza, C., Ramon, J. M., … Kunst, A. (2006). Social class, education, and smoking cessation: Long-term follow-up of patients treated at a smoking cessation unit. *Nicotine & Tobacco Research, 8*(1), 29-36. DOI:10.1080/14622200500264432.

Frings, D., & Albery, I. P. (2015). The Social Identity Model of Cessation Maintenance: Formulation and initial evidence. *Addictive Behaviors*, *44*, 35-42. DOI:10.1016/j.addbeh.2014.10.023.

Gleibs, I. H., Haslam, C., Haslam, S. A., & Jones, J. M. (2011). Water clubs in residential care: Is it the water or the club that enhances health and well-being? *Psychology & Health, 26*(10), 1361-1377. DOI:10.1080/08870446.2010.529140.

Haslam, S. A., Reicher, S. D., & Levine, M. (2012). When other people are heaven, when other people are hell: How social identity determines the nature and impact of social support. In Jetten, J., Haslam, C., & Haslam, S. A. (Eds.), *The social cure: Identity, health and well-being* (175-194). New York: Psychology Press.

Hayes, A. F. (2013). Introduction to mediation, moderation, and conditional process analysis: A regression-based approach. New York: Guilford Press.

Heatherton, T. F., Kozlowksi, L. T., Frecker, R. C., & Fagerström, K. O. (1991). The Fagerström Test for Nicotine Dependence – a revision of the Fagerström Tolerance Questionnaire. *British Journal of Addiction, 86*(9), 1119-1127. DOI:10.1111/j.1360-0443.1991.tb01879.x.

Høie, M., Moan, I. S., & Rise, J. (2010). An extended version of the theory of planned behaviour: Prediction of intentions to quit smoking using past behaviour as moderator. *Addiction Research and Theory, 18*(5), 572-585. DOI:10.3109/16066350903474386.

Hooper, M. W., Baker, E. A., & McNutt, M. D. (2013). Associations between coping, affect, and social support among low-income African American smokers. *Addictive Behaviors, 38,* 2736-2740. DOI:10.1016/j.addbeh.2013.07.005.

IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp.

Iyer, A., Jetten, J., Tsivrikos, D., Postmes, T., & Haslam, S. A. (2009). The more (and the more compatible) the merrier: Multiple group memberships and identity compatibility as predictors of adjustment after life transitions. *British Journal of Social Psychology*, *48*(4), 707-733. DOI:10.1348/014466608X397628.

Jetten, J., Haslam, C., Haslam, S. A., Dingle, G., & Jones, J. M. (2014). How groups affect our health and well-being: The path from theory to policy. *Social Issues and Policy Review*, *8*(1), 103-130. DOI:10.1111/sipr.12003.

Katainen, A. (2011). Smoking and workers' autonomy: A qualitative study on smoking practices in manual work. *Health: An Interdisciplinary Journal for the Social Study of Health, Illness and Medicine, 16*(2), 134-150. DOI:10.1177/1363459311403944.

Kotz, D. & West, R. (2009). Explaining the social gradient in smoking cessation: It's not in the trying, but in the succeeding. *Tobacco Control, 18*(1), 43-46. DOI:10.1136/tc.2008.025981.

Lawhon, D., Humfleet, G. L., Hall, S. M., Reus, V. I., & Muñoz, R. F. (2009). Longitudinal analysis of abstinence-specific social support and smoking cessation. *Health Psychology, 28*(4), 465-472. DOI:10.1037/a0015206.

Luck, K., & Beagan, B. (2014). Occupational transition of smoking cessation in women: "You're restructuring your whole life". *Journal of Occupational Science, 22*(2), 183-196. DOI:10.1080/14427591.2014.887418.

Markus, H. & Nurius, P. (1986). Possible selves. *American Psychologist, 41*,954-969. DOI: 10.1037/0003-066X.41.9.954.

Meijer E., Gebhardt W. A., Dijkstra A., Willemsen M. C. & Van Laar C. (2015). Quitting smoking: The importance of non-smoker identity in predicting smoking behaviour and responses to a smoking ban, *Psychology & Health* 30(12): 1387-1409. DOI:10.1080/08870446.2015.1049603.

Moan, I. S. & Rise, J. (2005). Quitting smoking: Applying an extended version of the theory of planned behavior to predict intention and behavior. *Journal of Applied Biobehavioral Research, 10*(1), 39-68. DOI:10.1111/j.1751-9861.2005.tb00003.x.

Moan, I. S. & Rise, J. (2006). Predicting smoking reduction among adolescents using an extended version of the theory of planned behavior. *Psychology and Health, 21*(6), 717-738. DOI:10.1080/14768320600603448.

Nagelhout, G. E., Willemsen, M. C., & De Vries, H. (2011). The population impact of smoke-free workplace and hospitality industry legislation on smoking behaviour. Findings from a national population survey. *Addiction, 106,* 816-823. DOI:10.1111/j.1360-0443.2010.03247.x.

Phua, J. J. (2013). The reference group perspective for smoking cessation: An examination of the influence of social norms and social identification with reference groups on smoking cessation self-efficacy. *Psychology of Addictive Behaviors, 27*(1), 102-112. DOI:10.1037/a0029130.

Pisinger, C., Aadahl, M., Toft, U., & Jørgensen, T. (2011). Motives to quit smoking and reasons to relapse differ by socioeconomic status. *Preventive Medicine, 52,* 48-52. DOI:10.1016/j.ypmed.2010.10.007.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments & Computers, 36*(4), 717-731.

Rayens, M. K., Hahn, E. J., & Nicholson, D. (2011). Psychosocial characteristics of smokers interested in quitting. *Journal of Health Psychology, 16*(2), 294-302. DOI:10.1177/1359105310373410.

Reid, J.L., Hammond, D., Boudreau, C., Fong, G.T., & Siahpush, M. (2010). Socioeconomic disparities in quit intentions, quit attempts and smoking abstinence among smokers in four western countries: Findings from the international tobacco control four country survey. *Nicotine & Tobacco Research,* 12 (S1): S20-33. DOI:10.1093/ntr/ntq051.

Rice, V. H., Templin, T., Fox, D. H., Jarosz, P., Mullin, M., Seiggreen, M., & Lepczyk, M. (1996). Social context variables as predictors of smoking cessation. *Tobacco Control, 5*, 280-285.

Roski, J., Schmid, L. A., & Lando, H. A. (1996). Long-term associations of helpful and harmful spousal behaviors with smoking cessation. *Addictive Behaviors, 21*(2), 173-185.

Royce, J. M., Corbett, K., Sorensen, G., & Ockene, J. (1997). Gender, social pressure, and smoking cessations: The community intervention trial for smoking cessation (commit) at baseline. *Social Science & Medicine, 44*(3), 359-370. DOI:10.1016/S0277-9536(96)00149-9.

Schaap, M. M., & Kunst, A. E., (2009). Monitoring of socio-economic inequalities in smoking: Learning from the experiences of recent scientific studies. *Public Health, 123,* 103-109. DOI:10.1016/j.puhe.2008.10.015.

Schaap, M., Van Agt, H. M. E., & Kunst, A. E. (2008). Identification of socioeconomic groups at increased risk for smoking in European countries: Looking beyond educational level. *Nicotine & Tobacco Research, 10*(2), 359-369. DOI:10.1080/14622200701825098.

Shadel, W. G., & Mermelstein, R. (1996). Individual differences in self-concept among smokers attempting to quit: Validation and predictive utility of measures of the smoker self-concept and abstainer self-concept. *Annals of Behavioral Medicine, 18*(3), 151-156. DOI:10.1007/BF02883391.

Sorensen, G., Emmons, K., Stoddard, A. M., Linnen, L., & Avrunin, J. (2002). Do social influences contribute to occupational differences in quitting smoking and attitude toward quitting? *American Journal of Health Promotion, 16*(3), 135-141.

Statistics Netherlands (2016a). CBS Statline. Retrieved from http://statline.cbs.nl/Statweb/publication/?DM=SLNL&PA=83021ned&D1=0-10,44,48,52&D2=0-13,30-42&D3=0&D4=l&HDR=T&STB=G1,G2,G3&VW=T.

Statistics Netherlands (2016b). CBS Statline. Retrieved from http://statline.cbs.nl/StatWeb/publication/?VW=T&DM=SLNL&PA=37296ned&D1=a&D2=0,10,20,30,40,50,60,(l-1),l&HD=130605-0924&HDR=G1&STB=T.

Statistics Netherlands (2016c). CBS Statline. Retrieved from http://statline.cbs.nl/StatWeb/publication/?VW=T&DM=SLnl&PA=82275NED&LA=nl.

Tarrant, M., & Butler K. (2011). Effects of self-categorization on orientation towards health. *British Journal of Social Psychology, 50,* 121-139. DOI:10.1348/014466610X511645.

Tombor, I., Shahab, L., Brown, J., & West, R. (2013). Positive smoker identity as a barrier to quitting smoking: Findings from a national survey of smokers in England. *Drug and Alcohol Dependence, 133*, 740-745. DOI:10.1016/j.drugalcdep.2013.09.001.

Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33–47). Monterey, CA: Brooks/Cole Publishing Company.

Van den Putte, B., Yzer, M., Willemsen, M. C., & De Bruijn, G. (2009). The effects of smoking self-identity and quitting self-identity on attempts to quit smoking. *Health Psychology, 28*(5), 535-544. DOI:10.1037/a0015199.

Vangeli, E., & West, R. (2012). Transition towards a 'non-smoker' identity following smoking cessation: An interpretative phenomenological analysis. *British Journal of Health Psychology, 17,* 171-184. DOI:10.1111/j.2044-8287.2011.02031.x.

Walsh, R. S., Muldoon, O. T., Gallagher, S. & Fortune, D. G. (2015). Affiliative and "self-as-doer" identities: Relationships between social identity, social support, and emotional status amongst survivors of acquired brain injury (ABI). *Neuropsychological Rehabilitation, 25*(4), 555-573. DOI:10.1080/09602011.2014.993658.

West, R. (2006). *Theory of addiction.* Oxford: Blackwell, Addiction Press.

Wetter, D. W., Cofta-Gunn, L., Irvin, J. E., Fouladi, R. T., Wright, K., Daza, P. … Gritz, E. R. (2005). What accounts for the association of education and smoking cessation? *Preventive Medicine, 40,* 452-460.

APPENDIX A: SOCIAL SUPPORT ITEMS SELECTED AS DESIRED SOCIAL SUPPORT

	Frequency (%)			
	SES groups			*Total (n = 387)*
Desired support items	*Lower (n = 74)*	*Middle (n = 121)*	*Higher (n = 192)*	
Negative support				
Comment on my lack of willpower if I would smoke	3 (4.1%)	8 (6.6%)	5 (2.6%)	16 (4.1%)
Criticize my smoking if I would smoke	1 (1.4%)	5 (4.1%)	9 (4.7%)	15 (3.9%)
Mention that smoking may have dangerous consequences for my health	4 (5.4%)	1 (0.8%)	14 (7.3%)	19 (4.9%)
Comment that my environment will smell of smoke again if I would smoke	4 (5.4%)	5 (4.1%)	8 (4.2%)	20 (5.2%)
Mentioned being bothered by smoke if I would smoke	0 (0%)	4 (3.3%)	8 (4.2%)	12 (3.1%)
Refuse to let me smoke around them	3 (4.1%)	3 (2.5%)	5 (2.6%)	11 (2.8%)
Mention that I would be disappointed with myself if I would smoke	3 (4.1%)	6 (5.0%)	6 (3.1%)	15 (3.9%)
Comment that smoking is a dirty habit	5 (6.8%)	6 (5.0%)	6 (3.1%)	17 (4.4%)
Positive support				
Compliment me on not smoking	**38 (51.4%)**	**58 (47.9%)**	**97 (50.5%)**	**193 (49.9%)**
Express pleasure at my efforts to quit	**22 (29.7%)**	**35 (28.9%)**	**63 (32.8%)**	**120 (31.0%)**
Tell me to stick with it	**21 (28.4%)**	26 (21.5%)	40 (20.8%)	87 (22.5)
Congratulate me for my decision to quit smoking	**21 (28.4%)**	26 (21.5%)	38 (19.8%)	85 (22.0%)
Ask me to continue quitting smoking	8 (10.8%)	7 (5.8%)	13 (6.8%)	28 (7.2%)
Talk me out of smoking another cigarette	7 (9.5%)	17 (14.0%)	9 (4.7%)	33 (8.5%)
Express confidence in my ability to quit	15 (20.3%)	30 (24.8%)	**55 (28.6%)**	**100 (25.8%)**
Practical support				
Participate in an activity with me that keeps me from smoking	9 (12.2%)	23 (19.0%)	**48 (25.0%)**	80 (20.7%)
Help to calm me down when I am feeling stressed or irritable	14 (18.9%)	**37 (30.6%)**	47 (24.5%)	**98 (25.3%)**
Help me think of substitutes for cigarettes	7 (9.5%)	17 (14.0%)	15 (7.8%)	39 (10.1%)
Help me think of substitutes for smoking	7 (9.5%)	29 (24.0%)	36 (18.8%)	82 (21.2%)
Celebrate my quitting with me	8 (10.8%)	8 (6.6%)	24 (12.5%)	40 (10.3%)

Note. Items selected by at least 25% of the (sub)sample are in bold.

APPENDIX B: EXPECTED SOCIAL SUPPORT

We conducted a principle component analysis (PCA) with orthogonal rotation (Varimax) on twenty items measuring positive and negative social support. The KMO statistic had a value of .93, indicating adequate sample size. Bartlett's test of sphericity indicated that correlations between variables were sufficiently large to perform a PCA, $\chi^2(190) = 4312.91$, $p < .001$. Both before and after rotation, 3 components had eigenvalues over Kaiser's criterion of 1, and in combination explained 61% of the variance. The items that clustered on the same component (based on highest rotated factor loadings) suggested that the three components represented negative support, positive support, and practical support. Two items that measure negative support in the PIQ (i.e., 'Ask me to continue quitting smoking' and 'Talk me out of smoking another cigarette') loaded more strongly on the positive support component (factor loadings .68 and .65, respectively) than on the negative support component (factor loadings .21 and .45, respectively) and were included in the positive support scale.

CHAPTER 4

STRENGTHENING QUITTER SELF-IDENTITY: AN EXPERIMENTAL STUDY

Eline Meijer, Winifred A. Gebhardt, Colette van Laar,
Bas van den Putte, and Andrea W. M. Evers

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.

Background variables.

Demographics.

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' ($\alpha = .86$).

Post-test.

Social support manipulation checks.

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'.

Outcome variables.

Quitter self-identity.

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.

Expected social support.

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 ($\chi^2(1) = .51$, p = .48, $V = .04$) nor the social support manipulation ($\chi^2(2) = 2.92$, $p = .23$, $V = .09$), 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***
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)
		ANCOVA[a]	**ANOVAs**		
		Quitter self-identity	***Imagined social support[b]***	***Credibility of social support[b]***	***Expected social support***
Independent variable	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 $\geq$ .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.

	Frequency (%)		
Code	***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) correspond 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.

REFERENCES

Amiot, C. E., Terry, D. J., Wirawan, D., & Grice, T. A. (2010). Changes in social identities over time: The role of coping and adaptation processes. *British Journal of Social Psychology*, *49*(4), 803-826. DOI:10.1348/014466609X480624.

Barreto, M. L. & Frazier, L. D. (2012). Coping with life events through possible selves. *Journal of Applied Social Psychology, 42,* 1785-1810. DOI:10.1111/j.1559-1816.2012.00918.x.

Best, D., Beckwith, M., Haslam, C., Alexander Haslam, S. A., Jetten, J., Mawson, E., & Lubman, D. I. (2015). Overcoming alcohol and other drug addiction as a process of social identity transition: The Social Identity Model of Recovery (SIMOR). *Addiction Research & Theory*, 1-13.

Bolger, N., Zuckerman, A., & Kessler, R. C. (2000). Invisible support and adjustment to stress. *Journal of Personality and Social Psychology*, *79*(6), 953 - 961. DOI:10.1037/0022-3514.79.6.953.

Brown, J. M. (1996). Redefining smoking and the self as a non-smoker. *Western Journal of Nursing Research*, *18*(4), 414-428.

Cohen, S., & Lichtenstein, E. (1990). Partner behaviours that support quitting smoking. *Journal of Consulting and Clinical Psychology, 58*(3), 304-309. DOI:10.13072/midss.466.

Dijkstra, A., Bakker, M., De Vries, H. (1997). Subtypes within a sample of precontemplating smokers: A preliminary extension of the stages of change. *Addictive Behaviours, 22*(3), 327-337. DOI:10.1093/her/15.4.423.

Frattaroli, J. (2006). Experimental disclosure and its moderators: a meta-analysis. *Psychological Bulletin*, *132*(6), 823-865. DOI:10.1037/0033-2909.132.6.823.

Frings, D., & Albery, I. P. (2015). The Social Identity Model of Cessation Maintenance: Formulation and initial evidence. *Addictive Behaviors*, *44*, 35-42.

Gleibs, I. H., Haslam, C., Haslam, S. A., & Jones, J. M. (2011). Water clubs in residential care: Is it the water or the club that enhances health and well-being? *Psychology & Health, 26*(10), 1361-1377. DOI:10.1080/08870446.2010.529140.

Hainmueller, J., Hangartner, D., & Yamamoto, T. (2015). Validating vignette and conjoint survey experiments against real-world behaviour. *Proceedings of the National Academy of Sciences*, *112*(8), 2395-2400.

Hendricks, P. S., Westmaas, J. L., Ta Park, V. M., Thorne, C. B., Wood, S. B., Baker, M. R., ... & Hall, S. M. (2014). Smoking abstinence-related expectancies among American Indians, African Americans, and women: Potential mechanisms of tobacco-related disparities. *Psychology of Addictive Behaviours*, *28*(1), 193-205. DOI:10.1037/a0031938.

High, A. C., & Solomon, D. H. (2014). Motivational systems and preferences for social support strategies. *Motivation and Emotion*, *38*(4), 463-474. DOI:10.1007/s11031-014-9394-5.

Høie, M., Moan, I. S., & Rise, J. (2010). An extended version of the theory of planned behaviour: Prediction of quit-intentions smoking using past behaviour as moderator. *Addiction Research and Theory, 18*(5)*,* 572-585. DOI:10.3109/16066350903474386.

King, L. A. (2001). The health benefits of writing about life goals. *Personality and Social Psychology Bulletin*, *27*(7), 798-807. DOI:10.1177/0146167201277003.

Layous, K., Nelson, S. K., & Lyubomirsky, S. (2013). What is the optimal way to deliver a positive activity intervention? The case of writing about one's best possible selves. *Journal of Happiness Studies*, *14*(2), 635-654. DOI:10.1007/s10902-012-9346-2.

Landis, J. R., & Koch G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics, 33*, 159-174.

Luck, K., & Beagan, B. (2015). Occupational transition of smoking cessation in women: "You're restructuring your whole life". *Journal of Occupational Science, 22*(2), 183-196. DOI:10.1080/14427591.2014.887418.

Marigold, D. C., Cavallo, J. V., Holmes, J. G., & Wood, J. V. (2014). You can't always give what you want: The challenge of providing social support to low self-esteem individuals. *Journal of Personality and Social Psychology*, *107*(1), 56-80. DOI:10.1037/a0036554.

Markus, H. & Nurius, P. (1986). Possible selves. *American Psychologist, 41*,954-969. DOI: 10.1037/0003-066X.41.9.954.

Mayer, R. E., & Massa, L. J. (2003). Three facets of visual and verbal learners: cognitive ability, cognitive style, and learning preference. *Journal of Educational Psychology, 95*(4), 833-846. DOI: 10.1037/0022-0663.95.4.833

McElwee, R. O. B., & Haugh, J. A. (2010). Thinking clearly versus frequently about the future self: Exploring this distinction and its relation to possible selves. *Self and Identity*, *9*(3), 298-321. DOI:10.1080/15298860903054290.

McCaul, K. D., Hockemeyer, J. R., Johnson, R. J., Zetocha, K., Quinlan, K., & Glasgow, R. E. (2006). Motivation to quit using cigarettes: a review. *Addictive Behaviours*, *31*(1), 42-56. DOI:10.1016/j.addbeh.2005.04.004.

Meijer E., Gebhardt W. A., Dijkstra A., Willemsen M. C. & Van Laar C. (2015). Quitting smoking: The importance of non-smoker identity in predicting smoking behaviour and responses to a smoking ban, *Psychology & Health* 30(12): 1387-1409. DOI:10.1080/08870446.2015.1049603.

Meijer, E. Gebhardt, W. A., Van Laar, C., Kawous, R., & Beijk, S. C. A. M. (2016). Socio-economic status in relation to smoking: The role of (expected and desired) social support and quitter identity. *Social Science & Medicine, 162,* 41-49.

Meijer, E., Van den Putte, B., Gebhardt, W. A., Van Laar, C., Bakk, Z., Dijkstra, A., … & Willemsen, M. C. (2017). A longitudinal study into the reciprocal effects of identities and smoking behavior: Findings from the ITC Netherlands Survey. *Manuscript submitted for publication.*

Mizock, L., Russinova, Z., & Shani, R. (2014). New roads paved on losses: Photovoice perspectives about recovery from mental illness. *Qualitative Health Research*, *24*(11), 1481-1491. DOI: 10.1177/1049732314548686.

Mizock, L., Russinova, Z., & DeCastro, S. (2015). Recovery narrative photovoice: Feasibility of a writing and photography intervention for serious mental illnesses. *Psychiatric Rehabilitation Journal*, *38*(3), 279-282. DOI: 10.1037/prj0000111.

Moan, I. S. & Rise, J. (2005). Quitting smoking: Applying an extended version of the theory of planned behaviour to predict intention and behaviour. *Journal of Applied Biobehavioural Research, 10*(1)*,* 39-68. DOI:10.1111/j.1751-9861.2005.tb00003.x.

Moan, I. S. & Rise, J. (2006). Predicting smoking reduction among adolescents using an extended version of the theory of planned behaviour. *Psychology and Health, 21*(6)*,* 717-738. DOI:10.1080/14768320600603448.

Mojaverian, T., & Kim, H. S. (2012). Interpreting a helping hand: Cultural variation in the effectiveness of solicited and unsolicited social support. *Personality and Social Psychology Bulletin*, DOI:0146167212465319.

Murru, E. C., & Martin Ginis, K. A. (2010). Imagining the possibilities: The effects of a possible selves intervention on self-regulatory efficacy and exercise behaviour. *Journal of Sport & Exercise Psychology*, *32*(4), 537-554.

Oettingen, G. (2012). Future thought and behaviour change. *European Review of Social Psychology*, *23*(1), 1-63. DOI:10.1080/10463283.2011.643698.

Ouellette, J. A., Hessling, R., Gibbons, F. X., Reis-Bergan, M., & Gerrard, M. (2005). Using images to increase exercise behaviour: Prototypes versus possible selves. *Personality and Social Psychology Bulletin*, *31*(5), 610-620. DOI:10.1177/0146167204271589.

Oyserman, D., Destin, M., & Novin, S. (2015). The context-sensitive future self: Possible selves motivate in context, not otherwise. *Self and Identity*, *14*(2), 173-188. DOI:10.1080/15298868.2014.965733.

Oyserman, D., & James, L. (2008). Possible selves: From content to process. In K. Markman, K., Klein, W. M. P. & Suhr J. A. (Eds.), *The handbook of imagination and mental stimulation* (pp. 373–394). New York: Psychology Press.

Oyserman, D., & James, L. (2011). Possible identities. In S. J. Schwartz, K. Luyckx, & V. L. Vignoles (Eds.), *Handbook of Identity Theory and Research* (pp. 117-145). New York: Springer.

Pennebaker, J. W., Mayne, T. J., & Francis, M. E. (1997). Linguistic predictors of adaptive bereavement. *Journal of Personality and Social Psychology*, *72*(4), 863-871.

Rafaeli, E., & Gleason, M. E. (2009). Skilled support within intimate relationships. *Journal of Family Theory & Review*, *1*(1), 20-37. DOI:10.1111/j.1756-2589.2009.00003.x.

Rennie, L. J., Harris, P. R., & Webb, T. L. (2014). The impact of perspective in visualizing health-related behaviours: first-person perspective increases motivation to adopt health-related behaviours. *Journal of Applied Social Psychology*, *44*(12), 806-812. DOI:10.1111/jasp.12266.

Royce, J. M., Corbett, K., Sorensen, G., & Ockene, J. (1997). Gender, social pressure, and smoking cessations: The community intervention trial for smoking cessation (commit) at baseline. *Social Science & Medicine, 44*(3), 359-370. DOI:10.1016/S0277-9536(96)00149-9.

Shadel, W. G., & Mermelstein, R. (1996). Individual differences in self-concept among smokers attempting to quit: Validation and predictive utility of measures of the smoker self-concept and abstainer self-concept. *Annals of Behavioural Medicine, 18*(3), 151-156. DOI:10.1007/BF02883391.

Shadel, W. G., Mermelstein, R., & Borrelli, B. (1996). Self-concept changes over time in cognitive-behavioural treatment for smoking cessation. *Addictive Behaviours, 21*(5), 659-663. DOI:10.1016/0306-4603(95)00088-7.

Stanczyk, N. E., Bolman, C., Muris, J. W., & de Vries, H. (2011). Study protocol of a Dutch smoking cessation e-health program. *BMC Public Health*, *11*(1), 847. DOI: 10.1186/1471-2458-11-847.

Strathman, A., Gleicher, F., Boninger, D.S., & Edwards, C.S. (1994). The consideration of future consequences: weighing immediate and distant outcomes of behaviour. *Journal of Personality and Social Psychology, 66,* 742-752. DOI:10.1037/0022-3514.66.4.742.

Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33–47). Monterey, CA: Brooks/Cole Publishing Company.

Tajfel, H., & Turner, J. C. (1986). The social identity theory of intergroup behaviour. In Worchel, S. & Austin, W. G. (Eds.), *The psychology of intergroup relations* (pp. 7–24). Chicago: Nelson-Hall.

Tausczik, Y. R., & Pennebaker, J. W. (2010). The psychological meaning of words: LIWC and computerized text analysis methods. *Journal of Language and Social Psychology*, *29*(1), 24-54.

Tombor, I., Shahab, L., Brown, J., & West, R. (2013). Positive smoker identity as a barrier to quitting smoking: Findings from a national survey of smokers in England. *Drug and Alcohol Dependence, 133*, 740-745. DOI:10.1016/j.drugalcdep.2013.09.001.

Tombor, I., Shahab, L., Brown, J., Notley, C., & West, R. (2015). Does non-smoker identity following quitting predict long-term abstinence? Evidence from a population survey in England. *Addictive Behaviors*, *45*, 99-103.

Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). Rediscovering the social group: A self-categorization Theory. Oxford: Basil Blackwell.

Van den Putte, B., Yzer, M., Willemsen, M. C., & De Bruijn, G. (2009). The effects of smoking self-identity and quitting self-identity on attempts to quit smoking. *Health Psychology, 28*(5), 535-544. DOI:10.1037/a0015199.

Vangeli, E., & West, R. (2012). Transition towards a 'non-smoker' identity following smoking cessation: An interpretative phenomenological analysis. *British Journal of Health Psychology, 17*, 171-184. DOI:10.1111/j.2044-8287.2011.02031.x.

Van Laar, C., Bleeker, D., & Ellemers, N. (2017). Ingroup support as a significant resource for the upward mobility of members of low status groups (submitted).

Van Laar, C., Bleeker, D., Ellemers, N., & Meijer, E. (2014). Ingroup and outgroup support for upward mobility: Divergent responses to ingroup identification in low status groups. *European Journal of Social Psychology*, *44*(6), 563–577. DOI:10.1002/ejsp.2046.

Walsh, R. S., Muldoon, O. T., Gallagher, S. & Fortune, D. G. (2015). Affiliative and "self-as-doer" identities: Relationships between social identity, social support, and emotional status amongst survivors of acquired brain injury (ABI). *Neuropsychological Rehabilitation, 25*(4), 555-573. DOI:10.1080/09602011.2014.993658.

West, R. (2006). *Theory of addiction.* Oxford: Blackwell, Addiction Press.

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)		
Characteristic		***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.

CHAPTER 5

IDENTITY PROCESSES IN SMOKERS WHO WANT TO QUIT SMOKING: A LONGITUDINAL INTERPRETATIVE PHENOMENOLOGICAL ANALYSIS

Eline Meijer, Eleni Vangeli, Winifred A. Gebhardt, and Colette van Laar

ABSTRACT

The importance of identity in smoking cessation is increasingly becoming recognized by researchers. This study is the first in-depth longitudinal qualitative investigation of identity change processes among smokers who intend to quit. Ten smokers with a quit-intention were interviewed three times, approximately one month apart, and approached for follow-up two years later. Data from 30 in-depth interviews were analyzed using the Interpretative Phenomenological Analysis approach. Results showed two themes in relation to identity: 1) Identity change toward 'nonsmoker' makes it easier to quit, and 2) Identity conflict resolution via psychological and behavioral strategies when quitting is unsuccessful or not attempted. Identity change appeared to be facilitated by permeable identity boundaries, a continuous sense of self, and a sense of mastery of quitting. Transition toward a nonsmoker identity may be necessary for successful quitting. Future research investigating ways to help smokers to perceive themselves increasingly as nonsmokers appears indicated.

Keywords: smoking cessation, identity, identity change, psychological processes, interpretative phenomenological analysis.

Most smokers want to quit smoking, but many are unsuccessful in doing so. In the United States in 2010 69% of daily smokers were interested in quitting smoking. In 2012 43% of current smokers had unsuccessfully attempted to quit in the year before (U.S. Department of Health and Human Services, 2014). Each year around 30% of Dutch smokers attempt to quit, but around 90% of them relapse within a year (Nationaal Expertisecentrum Tabaksontmoediging, 2015). Quitting smoking may be more difficult when this is not in line with how people perceive themselves. The role of identity has been identified as key for behaviour change in PRIME theory, which suggests that people are motivated to behave in correspondence with their identity (West, 2006). In line with this, quantitative research has shown that smokers who identify more strongly with quitting or nonsmoking are more likely to intend to quit, attempt to quit and stay abstinent, whereas smokers who identify more strongly with smoking are less likely to move away from smoking (Høie, Moan, & Rise, 2010; Meijer, Gebhardt, Dijkstra, Willemsen, & Van Laar, 2015; Meijer, Gebhardt, Van Laar, Kawous, & Beijk, 2016; Meijer, Van den Putte, et al., 2017; Moan & Rise, 2005, 2006; Tombor, Shahab, Brown, & West, 2013; Tombor, Shahab, Brown, Notley, & West, 2015). Furthermore, nonsmoker and quitter identities may be more important for smoking cessation than smoker identities (Meijer et al., 2015; Meijer, Gebhardt, Van Laar, Kawous, et al., 2016; Meijer, Van den Putte, et al., 2017). However, less work to date has investigated how identity may change during the process of quitting smoking.

Two longitudinal quantitative studies found that continuing smokers increasingly identified with smoking over time, whereas among ex-smokers identification with smoking decreased, and that motivates for smoking, social norms and socio-economic status may play a role in shaping identity (Hertel & Mermelstein, 2016; Meijer, Van Laar, et al., 2017). Although these findings are valuable, quantitative studies provide only partial insight into the fine-grained psychological processes that enable identity to change. Qualitative methods allow for a more in-depth analysis of identity change processes and have been applied among ex-smokers to explore identity change in the processes of quitting smoking. Qualitative work with long-term ex-smokers shows that identity change may involve a continuous process of transition whereby nonsmoking increasingly becomes part of how they perceived themselves (Brown, 1996; Luck & Beagan, 2014; Vangeli & West, 2012). The findings of these studies suggest that change towards a nonsmoker identity may be enabled by continuous reaffirmation of the new identity of nonsmoker (Brown, 1996), a transitional quitting identity (Vangeli & West, 2012), and learning of new behaviors such as gardening that were not associated with smoking (Luck & Beagan, 2014). Vangeli and West (2012) highlight a fluidity of smoking-related identity following cessation. That is, while participants identified themselves using the self-label of 'nonsmoker', oscillation between a 'smoker' and 'nonsmoker' self was described in the accounts, with the 'nonsmoker' self gaining strength over time for most,

possibly with increasing mastery over the 'smoker' self. Importantly, another study found that some women who quit smoking during pregnancy returned to smoking because of a sense of 'nostalgia for the former self', suggesting that a lack of identity change may be a risk for relapse (Bottorff, Johnson, Irwin, & Ratner, 2000).

Notably, this cross-sectional qualitative work affords only retrospective exploration of identities and identity change processes that occur prior to the interview point several months or years after cessation. While this offers valuable insight into how ex-smokers make sense of their experiences and how this has changed over time, it does not allow direct exploration of the experience of identity during the processes of quitting. To our knowledge, the current study is the first longitudinal qualitative study to explore identity change processes among smokers who intend to quit. We investigated in-depth how smokers' sense of identity may change during the process of quitting, and what happens to their sense of identity if they are unable to quit successfully. Ten smokers who intended to quit within two months were interviewed in-depth using semi-structured interviews three times and approached for follow-up after two years. An Interpretative Phenomenological Analysis (IPA) (Smith, Flowers, & Larkin, 2009) approach was taken to the data-collection and data-analysis. This analytic approach focuses on how individuals interpret and make sense of their experiences, and is, therefore, very well suited to the exploration of identity change processes (Smith, 1999; Smith et al., 2009; Vangeli & West, 2012). The relatively small sample size is necessary to enable the idiographic focus of IPA and thus the development of insights that are contextually embedded (Smith et al., 2009).

METHOD

Participants

Ten daily smokers with an intention to quit smoking within two months were included (see Table 1 for participant characteristics). Five participants were recruited through an advertisement in a local newspaper, and five through the researchers' social networks. Two participants were superficially known to the first author before the study commenced, as they (had) worked at the same university. Participants were given pseudonyms.

Procedure

Participants were informed about the study and gave written consent. Participants were interviewed in-depth three times, approximately one month apart. The interviews took place in 2014 and 2015, at participants' home or at the University of the first author, according to participants' preferences. The first author conducted semi-structured

Table 1. Participant characteristics.

Name	Gender	Age (T1)	SES	Age daily smoking	Quit attempts		Smoking status (#cigarettes p/day)			Use of quit aids/ professional support during study
					Previous	During study	T1	T2	T3	
Iris	Female	25	Middle	17	2	1	Smoking (2)*	Abstinent (0)	Abstinent (0)	None
Julia	Female	48	Higher	14	± 5	1	Abstinent since 4 days; smoked 10	Abstinent (0)	Abstinent (0)	None
Sophia	Female	69	Lower	13	2	1	Smoking (15)	Abstinent (0)	Abstinent (0), smoked 1 cig. since T2	Six-week group smoking cessation course
Louis	Male	45	Lower	15	Many	1	Smoking (20)	Abstinent (0)	Abstinent (0)	Mobile phone quit app
Karen	Female	54	Lower	18	Many	4 (1.5 – 4 days)	Smoking (8-10)	Smoking	Smoking (6)	E-health application (developed by professional addiction institute)
Peter	Male	33	Higher	15	Many	2 periods of abstinence from regular cigarettes and e-cigarette (5-7 days when on holiday)	Smoking (10 + e-cigarette with nicotine)	Smoking (10 + e-cigarette with nicotine)	Smoking 10 (+ e-cigarette with nicotine)	None, does not perceive e-cigarette as quit aid
Tom	Male	57	Lower	13	2	5 (<1 day)	Smoking (15-18 + e-cigarette with nicotine)	Smoking (10-15 + e-cigarette with nicotine)	Smoking (15 + e-cigarette with nicotine)	E-cigarette
Chris	Male	24	Higher	14	3	0	Smoking (19)	Smoking (19)	Smoking	None
Esther	Female	29	Higher	21	None	0	Smoking (23)	Smoking	Smoking (23)	Psychotherapy (general)
Brigitte	Female	43	Higher	19/20	3	0	Smoking (16)	Smoking (16)	Smoking (18)	½-day group smoking cessation course

Note. SES = Socio-economic status; previous quit attempts = serious quit attempts lasting >24 hours.

* Iris indicated that she smoked 4-10 cigarettes per day when she was included in the study, six days before T1.

interviews that were developed to be open to participants' experiences and areas that were relevant to them. Important topics that arose were probed by the interviewer. If smoking-related identity was not raised spontaneously by participants then the interviewer asked about this toward the end of the interview to enable its exploration without shaping the rest of the interview. The questions about identity were 'What are your thoughts about smoking/nonsmoking/quitting? Does it fit with who you are?' and 'What are your thoughts about people who smoke/do not smoke/quit smoking?'. The initial interview lasted approximately one hour, and subsequent interviews lasted between approximately 45 and 60 minutes. Life lines with separate boxes for smoking, important events and social processes were used to help participants organize their narratives chronologically during the interview, and to make participants feel at ease (Wilson, Cunningham-Burley, Bancroft, Backett-Milburn, & Masters, 2007). The interviews were recorded with a voice recorder and transcribed verbatim. Participants received €50 for their participation. The procedure was approved by the Ethical Committee of Psychology of the first author's University. To explore whether the identity processes observed during the interviews related to identity perceptions and smoking cessation over a year later, participants were approached for a brief online follow-up questionnaire in October 2016. This questionnaire contained questions about smoking status, quit attempts and identity (i.e., 'How do you see yourself in relation to smoking?'; see Appendix).

Analysis

Data were analyzed using an IPA approach. IPA is grounded in phenomenology and is committed to understanding the participant's lived experience and meaning-making. A 'double hermeneutics' is used wherein the researcher interprets the participant's interpretations, thus privileging the participants' understandings but also recognizing the central role of the researcher in the interpretive process. Furthermore, IPA has an idiographic focus and aims for a detailed analysis of each case (Smith et al., 2009). Data were therefore analyzed on a case-by-case basis. Moreover, the longitudinal analysis was in accordance with the few longitudinal IPA studies that have been published to date (Smith, Spiers, Simpson, & Nicholls, 2016; Snelgrove, Edwards, & Liossi, 2013; Spiers, Smith, & Drage, 2015). The steps taken in the analysis were as follows: First, the transcript of the first interview of a participant was read carefully. Second, initial notes were taken on a descriptive, linguistic and conceptual level. Third, emergent themes were developed that captured these initial notes. Fourth, the emergent themes for the first interview were grouped into superordinate themes, according to similarity of content or connections between emergent themes. We continuously checked that our interpretations were grounded in the data by rereading the transcripts, and listening to the audiotapes when necessary. This process was repeated for the second and third interview with the same participants. After completing the separate analysis of each of the

three interviews for one participant, we examined transitional themes over time in order to identify changes in a participant's sense of identity, as well as potential mechanisms of identity change, and processes that may facilitate or hinder identity change. We then moved on to the next participant. As a final step, the themes were compared across participants within a homogeneous subgroup with respect to smoking cessation (i.e., those who quit successfully, and those who did not quit successfully). The analysis continued in the writing-up process. The analysis was performed primarily by the first author, who kept a reflexive log throughout data collection and analysis. For six interviews, the first three steps of the analysis (i.e., reading, initial noting, emergent themes) were also performed by a second analyst, and emergent themes were discussed. Interpretations were regularly discussed with the second and third author to ensure that they were grounded in the data.

RESULTS

All participants intended to quit smoking within two months (see Table 1 for participant characteristics and smoking/quitting behavior over the course of the study). During the study, four participants quit successfully (Iris, Julia, Sophia and Louis), three participants attempted to quit but were unsuccessful (Karen, Peter and Tom), and three participants did not attempt to quit (Chris, Esther and Brigitte). Table 2 provides an overview of participants' identities in relation to smoking and quitting over time, and presents example quotes for each participant at each interview. Most participants related smoking and quitting to their self-concept, such that they perceived the behavior of smoking (or quitting) as conflicting or matching with other identities (e.g., as a father) and self-perceptions (e.g., as recalcitrant) that they held that were not directly smoking-related (see Table 2). For example, Esther (T1, smoker) perceived smoking as conflicting with her professional role: 'Actually it [smoking] does not fit with me at all… And, and my job, and, and… Things that I find important'.

The analysis found two themes in relation to identity: 1) Identity change toward 'nonsmoker' makes it easier to quit, and 2) Identity conflict resolution with psychological and behavioral strategies when quitting is unsuccessful or not attempted. The identity dynamics observed are described in more detail below.

1. Identity change toward 'nonsmoker' makes it easier to quit

Four participants (Iris, Julia, Sophia and Louis) quit smoking successfully and did not relapse during the course of the study. While Sophia and Louis retained a stable smoker identity across their interviews and struggled to adjust to the absence of smoking, Iris and Julia accommodated nonsmoking into their lives with relative ease. Adjustment to

Table 2. Overview of identities in relation to smoking and quitting over time, and other identities held by participants.

Example quotes regarding identity				Other identities or self-perceptions (matching or conflicting with smoking)
Name	**T1**	**T2**	**T3**	
Iris	*Not a smoker*: "Actually I don't [see myself as a smoker] (…) It sounds so strange, some people say oh, do you smoke? I say yes... They say oh, I didn't expect that from you. So that is, that is stupid. (…) I'd say, you're right, that's what I think."	*Ex-smoker in rehab*: "[I see myself as] Ex-smoker, yeah. (…) Now I'm in the rehab phase."	*Ex-smoker*: [Interviewer: Can you tell me how you see yourself now?] "Err... person that entered a new period I think. [Interviewer: And do you feel like a nonsmoker now or an ex-smoker?] I think an ex-smoker. Because it's in the past. A nonsmoker is that you've never smoked. And maybe in a couple of years, that's possible. But now you've just entered that next phase, of course I've just, just left it behind me."	*Conflicts*: confident person (T1); person that entered a new period (T3)
Julia	*Smoking nonsmoker*: "Maybe [I see myself] more as a nonsmoker who smokes [laughs]. Can you say such a thing?"	*Detoxed smoker*: "If you've been smoking, you'll always sort of ... err stay a detoxed smoker. [Interviewer: Do you feel like a detoxed smoker?] Yes! I do (…) I'm very happy with it." "[I am] Eighty per cent nonsmoker, I think."	*Ex-smoker nonsmoker*: "I think [I see myself as] as an ex-smoker. (…) That means that you smoked and that you, you smoked, yeah, and also that you know what it's like to be addicted to cigarettes. Yes. (…) Yeah, I also see myself as nonsmoker. Yes. Ex-smoker nonsmoker. That is, that can be the same right? Yeah."	No other identities/self-perceptions mentioned
Sophia	*Anti-smoker who smokes*: "I've got ten reasons [to quit] because I am such an anti-smoker, who is smoking. So that doesn't make sense."	*Smoker who does not smoke*: "I'm still an err, I'm still a smoker who does not smoke. Yes. And I might stay that for the rest of my life."	*Smoker who does not smoke*: "I am a smoker who does not smoke" "Of course it [smoking] fits with me because it, just as long as I've been living consciously, you know, err... [silence] But it does not fit with me because how I, how I am."	*Conflicts*: Mother (T1, T2); autonomous woman (T1); someone who is in-control (T1, T2, T3); assertive (T2, T3); independent (T3); decisive (T3); socially engaged (T2); environmentally aware (T2)

Table 2. Overview of identities in relation to smoking and quitting over time, and other identities held by participants. (continued)

	Example quotes regarding identity			Other identities or self-perceptions (matching or conflicting with smoking)
Name	**T1**	**T2**	**T3**	
Louis	*Real smoker*: "I find myself a real, I find myself a real smoker yes. Yes. Yes. Can't, I don't really know why though, but err, yes. (…) I think it really fits with me, yeah. But I think that's also because I've been smoking for 30 years of course. So it's been quite a while."	*Smoker who does not smoke*: "I can't say, yeah, I can't err, I can't say, for myself, that I am a nonsmoker or something now, that I have quit smoking. That, that, I absolutely don't see it that way. I still think I am a smoker... who maybe doesn't smoke now."	*Smoker who does not smoke*: "I talked to someone and he said, I am an, I'm just a smoker who does not smoke for a while. Well, that's my idea too, that's how I feel. That, that fits with me, a little. So I am a smoker, or I feel like a smoker, but I'm just not smoking for a while."	No other identities/self-perceptions mentioned
Karen	*Not a smoker*: "Whether smoking fits with me, no. I don't see a monkey errr... smoke. I don't see dogs walking around with a cigarette butt. So it doesn't fit at all. You sometimes try to compare it, like that. Do you see that cat smoking, you know [laughs]?" *Addict*: "[After quitting] You're no longer that addict who err runs to the petrol station to get a pack of cigarettes."	*Not a smoker*: "It [smoking] doesn't fit at all! No. Not at all, no. And it's not to save my face, it is... why... it's just to admit to errr, a err, a nicotine addiction, actually. I'm so ashamed." "The feeling of exasperation a- about yourself, and disappointment, it becomes so strong that you think aaaah, that makes you feel so [emphasized 'so'] cranky. Woman, why are you doing that?"	*Prospective quitter*: "I see, I see myself as an err a prospective quitter. Hmm, yes, yes. I don't want to belong with the smokers anymore, no, no."	*Conflicts*: Enterprising (T1); mother/example for daughter (T1)

Table 2. Overview of identities in relation to smoking and quitting over time, and other identities held by participants. (continued)

Example quotes regarding identity				Other identities or self-perceptions (matching or conflicting with smoking)
Name	**T1**	**T2**	**T3**	
Peter	*Denial*: "I don't think that it fits with someone, yes or no, when you're talking about smoking. So. You either do it or you don't. Does it fit with you? No idea."	*Denial*: "I am who I am, the moment I am smoking I am someone who is smoking, the moment I don't I'm not. At the moment that I, now, that I think about that I shouldn't do it I am someone who is quitting smoking. And then after that, when I'm smoking a cigarette again, I am someone who smokes. It's not something that interests me."	*Not a smoker*: "Maybe things have fallen into place. Deep down I know that I'm not a smoker, really. I've always know that. I know that I have to quit smoking, that I want to again, I, that I just want, want to do sports normally and err, want to look and want to feel healthy and fit. I've always know that."	*Matches*: Obstinate (T1); someone who goes for it 'full power' (T1); someone who wants to be different from others (T2); someone who goes his own way (T3) *Conflicts*: Father (T3); risk avoider (T2)
Tom	*Smoker*: "[Interviewer: Does smoking fit with you?] Yes. That's also what other people say. They also say, it [smoking] really belongs with you. They see me with a butt, they say Tom, it really fits with you. Yes. It fits with me, yes. Yes, yes, yes, yes."	*Smoker*: [Talks about smoking after a brief period of abstinence] "Yes, then you're back. You're just normal again".	*Human being who smokes*: "I see myself as a human being who smokes." "And you think do you see yourself as a smoker, no, I just see myself as a human being."	*Matches*: Recalcitrant (T1, T2); tough guy (T1, T2); risk taker (T1); all-or-nothing person (vulnerability to addiction) (T2); young (smoking shared activity with wife associated with being young) (T1, T3); not determined* (T1) *Conflicts*: Health freak (T3)

Table 2. Overview of identities in relation to smoking and quitting over time, and other identities held by participants. (continued)

	Example quotes regarding identity			Other identities or self-perceptions (matching or conflicting with smoking)
Name	**T1**	**T2**	**T3**	
Chris	*Smoker*: "It [smoking] is such a palette of things that it's associated with in your life, that it becomes very interwoven or something like that, that's how I see it now. That's very strange, that, you really grow together with it or something."	*Smoker*: "It [smoking] does not have to, it does not have to fit. So it's not, it's not really an image that I like. (..) Sometimes I see myself smoking, from the third person and I think well, ok, it fits, yeah, but it's also strange to see yourself, then. (..) You notice that it has really melted together with who you are, so it's all very logical that you do that [smoking], nothing strange about that, and it's very usual, and then I think oh! Pffff, it would be relaxed if that [being a smoker] wouldn't be the case anymore."	*Smoker with SOS signal*: [Interviewer: How do you see yourself?] "[sighs] Well, still a complete smoker. Yes. But err, a smoker with a sort of err [laughs] SOS err signal. But that [SOS signal] is just for me."	*Matches*: Someone who needs freedom and does not need rules* (T1, T2); thinker/philosopher* (T1, T2); impulsive* (T2); easy going* (T3); flexible* (T3); indifferent* (T3); inaccurate* (T3) *Conflicts*: Partner (Chris feels that smoking complicates being an honest and sincere partner) (T1)
Esther	*Smoker*: "It [smoking] is so intertwined, interwoven with all those aspects that you really, actually it is a sort of, if I may use a metaphor, err, a really tight large net that completely surrounds you" *Not a smoker*: "I was smoking and I just looked at my cigarette, like, and I thought this really is not who I am [emphasized 'am'], this doesn't fit with me at all!"	*Smoker*: "It's a confrontation with yourself, with a side of yourself [that smokes] (…) It is not nice to have to say, hey, I'm doing something [smoking], I don't want to do it, but if I quit I think I'll fail. It's not nice if you have to say that to yourself."	*Smoker*: "I can't, with, with, say well yeah, I am not a smoker, in essence, because I do smoke. And I think well, if I'm not [a smoker] in essence, I wouldn't be smoking now."	*Matches*: All-or-nothing person* (T1); impulsive* (T1) *Conflicts*: Professional identity (T1, T2); someone who does not walk away before finishing (T1)

Table 2. Overview of identities in relation to smoking and quitting over time, and other identities held by participants. (continued)

	Example quotes regarding identity			Other identities or self-perceptions (matching or conflicting with smoking)
Name	**T1**	**T2**	**T3**	
Brigitte	*Addict*: "I do, that I'm sensitive to addiction and there ... that's something of my identity. And that I thus err... make the choice to smoke all the time, but being a smoker is a behavior and so I don't see that as an identity."	*Addict*: [Talks about own experience] "Well yeah, if you just say to a, whatever kind of addict... Err.. It's over tomorrow, never again. Then you have, with whatever kind of addict, arousal levels will definitely increase (..) That's what you're an addict for."	*Smoker*: "I am and I'll stay a smoker."	*Matches*: Demanding person* (T1); someone who needs relaxation (T1)

*Participant indicated that this identity or self-perception complicated quitting.

Note. Identity labels (in italics) do not necessarily reflect smoking status, but reflect participants' self-perceptions (see Table 1 for smoking behavior at each time-point).

the absence of smoking appeared to be facilitated by a process of change in identity that integrated nonsmoking. This theme will first explore how the integration of nonsmoking into identity developed over time in the accounts of Julia and Iris, followed by three mechanisms that appeared to facilitate this change via the subthemes of 1) Permeable identity boundaries; 2) Identity continuity in the absence of smoking; and 3) Mastery of quitting. The contrasting experiences of Sophia and Louis will also be explored in relation to the theme and subthemes above.

Nonsmoking becomes a part of identity.

Iris and Julia quit successfully over the course of the study. They both showed a change in identity, such that over time nonsmoking became increasingly integrated in the way they perceived themselves (see Table 2). This change in identity made it easier for them to quit. At the first interview both described incongruence between their smoking and who they perceived themselves to be. For example, when Iris was asked how she perceived herself in relation to smoking in the first interview, she said that she did not perceive herself as a smoker, although she smoked. Aware of an irregularity in her declared 'not a smoker' identity Iris immediately noted that this "sounds very strange", possibly revealing discomfort with the incongruence of her behavior with her identity. Similarly, Julia said that she saw herself as a "nonsmoker who smokes" and her discomfort with this became more explicit as she explained what this meant to her: "For me, it's always been like, I do smoke, but I'm not okay with it". These self-definitions showed a distancing away from identification with smoking and were confirmed by the surprise of others to learn of their smoking. For example, Julia explained:

> *I've heard that a lot, that people told me, like, because they never saw me smoke during the day, or the dentist, you know, they'd say well, that err [whispered] YOU? Are you serious? [continued in normal voice] That doesn't fit at all, or, that can't possibly be, you know. (Julia, T1)*

However, although Iris and Julia did not identify with smoking, they also did not perceive themselves yet as nonsmokers. At the second interview Iris and Julia had been abstinent for the past 5 and 32 days, respectively, with Iris having had several other smoke-free periods since the first interview. Both described an identity that was associated with recovery from addiction: Iris identified as an 'ex-smoker in the rehab phase' and Julia as 'a detoxed smoker'. These suggest a process of transition to restore oneself to a more positive condition (e.g., restoration to health or removal of a toxic substance). Julia already perceived herself as an 'eighty percent nonsmoker' (T2; see Table 2), such that the identities as detoxed smoker and nonsmoker co-existed.

The 'ex-smoker in rehab' identity was perceived as temporary by Iris, who believed that she could become a nonsmoker with time:

Interviewer: When would you say that you're a nonsmoker?
Iris: Well, I think, in at least five years.
Interviewer: What would you need for that?
Iris: Yes err, well, yeah, I could also feel like a nonsmoker in a year, but that's, we'll have to see. Now I'm still in the re-, re- err rehab phase. Could be a year, or in five years, but also in a couple of months, depends on how quickly it goes. (Iris, T2)

Although Iris was unsure about how much time she would need before she would become a nonsmoker, she perceived this to be transitional, in the 'ex-smoker in rehab' phase. Julia was a bit more doubtful whether she would move beyond her 'detoxed smoker' identity:

I think that once you've been smoking, you know, you always sort of... err stay a detoxed smoker. I guess, that you, yeah, maybe, I hope that it, or in a year, that you think well, I can't imagine that I ever smoked. That it's just out of your system (…) And it [abstinence] has just been a month, so it's not been that long [laughs]. (Julia, T2)

Whereas Julia believed that her (unchangeable) smoking history would 'always' define her as a detoxed smoker, at the same time she hoped that one day she would not even be able to picture herself smoking anymore. Her addition of 'it's not been that long' suggests that she might move beyond her 'detoxed smoker' identity in the future, a future that was relatively close ('in a year'). By the third interview, Iris and Julia (29 and 67 days abstinent, respectively) perceived themselves as ex-smokers. When Iris was asked how she saw herself now, she described herself as follows:

Iris: Err... [a] *person that entered a new period, I think.*
Interviewer: And do you feel like a nonsmoker now or an ex-smoker?
Iris: I think an ex-smoker. Because it's in the past. A nonsmoker is that you've never smoked. And maybe in a couple of years, that's possible. But now you've just entered that next phase, of course I've just, just left it behind me. (Iris, T3)

Thus, in the third interview, Iris identified herself as an 'ex-smoker' as she did in the second interview. However, instead of being in the 'rehab phase', she had now entered 'a new period' and 'next phase', and left 'it' behind her. Smoking was 'in the past': she successfully moved away from her past self as a smoker, and she marked this as a definitive change.

Similarly, Julia presented herself as an "ex-smoker nonsmoker' instead of a 'detoxed smoker' (Table 2), suggesting that she no longer perceived herself as a person in the process of recovery. To her, being an ex-smoker meant that she had smoked, and being a nonsmoker meant that she had moved away from smoking far enough, which she described as 'smoking being out of your system'. Quitting was relatively easy for Iris and Julia, for example, in the third interview Julia said "It has been going very well, yes, very well. Little to no urge [to smoke]".

The change observed in Iris' and Julia's identity involved a distancing away from a former smoker self, and increasing accommodation of nonsmoking in their self-perceptions. Unlike Iris and Julia, Sophia and Louis did not show a change in identity, and this lack of identity change appeared to make quitting more difficult for them. Even though they no longer smoked, they essentially remained smokers in the way they viewed themselves. They both continued to see themselves as a 'smoker who does not smoke' in the second and third interview (see Table 2).

Permeable identity boundaries enable identity change.

As shown above, Iris and Julia increasingly perceived themselves as nonsmokers over time, but Sophia and Louis did not. The identity change processes observed for Iris and Julia appeared to be enabled by a perception of fluid, permeable boundaries between smoking-related identities and behavior (e.g., smoking when 'not a smoker' and 'smoking nonsmoker').

As explored in the previous subtheme, Iris initially defined being a nonsmoker as having 'never smoked', such that becoming a nonsmoker was impossible for her. However, she immediately added that becoming a nonsmoker is possible with time, suggesting that for Iris the identity of nonsmoker did not have clear demarcated boundaries. In a similar way, Julia called herself an 'ex-smoker/nonsmoker' in the third interview, and suggested that "that can be the same, right?". This indicates that Julia thought of the two identities as merged, which allowed her to identify with being a nonsmoker, despite her history as a smoker. As such, Iris and Julia did not think of being a smoker or nonsmoker as fixed identities with clear boundaries, but as dynamic identities with more fluid, or permeable, boundaries. This allowed them to navigate between the identities of smoker and nonsmoker, and to perceive themselves increasingly as people who no longer smoked and, eventually as nonsmokers.

In contrast, Sophia and Louis had stable perceptions of the identities as smoker and nonsmoker. They both highlighted their smoking history as a reason for seeing the self as a smoker:

> *Of course it [smoking] fits with me because it, just as long as I've been living consciously, you know [I smoked]. (Sophia, T3)*

I think it [smoking] really fits with me, yeah. But I think that's also because I've been smoking for 30 years of course. So it's been quite a while. (Louis, T1)

The smoking history of Sophia and Louis was for them a stable factor in defining who they are, and the possibility of identity transition to nonsmoker unlikely or out-of-reach. This is observed for example when Sophia talked about what it would be like to be a nonsmoker in the second interview, she said:

Well, I hope there will be a time... I will only be a nonsmoker if it [smoking] no longer is a subject for me, so, that I for example just haven't thought about it for three days, and that I can just say no thanks, I don't smoke. Because I, I, I, I err, I don't have to tell anymore that I smoked in the past and that it was so difficult for me, that is... behind me. But now it's just, the most important issue for me, you know. (Sophia, T2)

Sophia appeared to expect that she could only become a nonsmoker in the far future ('a time') and whether this happened at all appeared to be driven by 'hope' rather than expectation. Her use of 'only' suggests that the requirements for becoming a nonsmoker are difficult to fulfill. These requirements are absolute (not thinking about smoking at all, being able to simply reject a cigarette) and very different from her current situation (thinking about smoking a lot, explaining that she just quit smoking when being offered a cigarette). This distinct and absolute nature of feelings and actions creates an impermeable boundary around the identity of nonsmoker, making transition from smoker impossible without renouncing smoking completely psychologically as well as behaviorally.

Identity change is facilitated by a sense of identity continuity.

In addition to fluidity between identity boundaries, a continued sense of self also appeared to facilitate identity change. Both Iris and Julia felt that quitting smoking allowed them to become the people that they essentially already perceived themselves to be when they were still smokers. In the second interview, Iris explained that "It [quitting] goes with it now. I still see the same person". As such, although her identity changed toward becoming a nonsmoker, she felt that at the core she had stayed the same person. The importance of a continued sense of self in the absence of smoking highlighted in the extract from Julia's account below:

I'm very happy with it [being a detoxed smoker]. So it's not as if I'm thinking ooooh my life is err... Like a friend of mine, life is not worth living, I've lost my best friend, and that that that, that's really what it's like for her... I err, what do I have, that, that she became depressed like, what's the point of my life. (…) Attributing it all to, err, well, if it has to be

like this, if my life has to be this way, well I'd rather continue smoking and then err, then, with all the risks attached. (Julia, T2)

Julia was 'very happy' with being a detoxed smoker, and contrasted her own experiences with those of a friend who clearly found it difficult to quit smoking. According to Julia, this friend felt like she had lost her 'best friend' (the cigarette), and lost her sense of meaning in life to the point of depression. Presenting the inconsolable loss experienced by a friend highlights Julia's perception that life without smoking carries an existential threat for some, an attribution that Julia perceived as unhealthy. The contrasting of her friend's existential crisis with her own positive experience of quitting suggests that Julia perceived identity continuity to be important.

Whereas Iris and Julia showed a continued sense of self, Sophia and Louis experienced a sense of disconnection, or loss of self, similar to that experienced by Julia's friend, when they quit smoking. In the second interview, when Sophia talks about the difficulty she had with quitting, she explains:

Sophia: I think well, Sophia, it's practically beneficial [to quit] *and you just don't see it now err...* [silence] *but it doesn't feel that way, I, rationally, I'm convincing myself, but it doesn't feel that way.*
Interviewer: Hmm. So how does it feel then?
Sophia: Well, the way I told you. Err, err... It's [smoking] *a friend, you know, you are a p-, an err, in a way you're amp- amputated* [silence].
Interviewer: Part of you is-
Sophia: Part of what my life was like, I mean, coffee, I didn't smoke much just like this, but, or an, and, but I err, never [had] *a cup of coffee without a cigarette. And here I am with that... thing.* (Sophia, T2)

In the extract above, Sophia had tried to convince herself that quitting was a good thing, but to no avail, and instead describes a sense of loss both in terms of the experience of pleasure (i.e. drinking coffee now reduced to an unremarkable 'thing') and to her sense of self that had become incomplete via amputation. While talking about this Sophia displayed signs of distress as she drummed her fingers frantically on the table. The comparison of smoking to a friend whose absence leads to a feeling of amputation invokes a sense of inconsolable bereavement, echoing the experience presented by Julia about her friend. At the end of the second interview when asked what smoking meant to her Sophia elaborates on this friendship: "Smoking is an err... a very dominant friend, err... that I find it very difficult to say goodbye to, but what's actually a err, a err bothering thing, or person". The extract above shows that Sophia perceives the absence of smoking to be more complex than simply missing a friend who provides safety and

familiarity, but rather paints a problematic relationship with smoking as the 'dominant friend' and Sophia as the submissive friend with limited agency to end it.

Sophia smoked one cigarette between the second and third interview. When she was asked what this was like, she explained:

> *Well, in the first place it makes you completely dizzy. Pfffffff, yeah. [silence] Look, you've been doing something for fifty years, and you're not doing that anymore. And that is, so it's err, err, a sort err, s- safe and familiar or, or err, yeah, you're a little bit, who you were, let me put it like that. The amputation is gone. (Sophia, T3)*

In Sophia's account above, she describes the feeling of smoking a cigarette as returning her to the person she was before, a person who is free from amputation, complete. Louis also struggled with his abstinence and felt different since he quit. This was most pronounced in the third interview, when he explains his psychological difficulties:

> *You only stay stuck in some sort of... irrational anger. That really is, that's scary. I'm anxious about that. (…) If someone would say well, this, cope with it for this one week and then err, it's over, promise, and then you'll be err yourself, because I really don't feel like myself right now. You know, like that. And, but in a week then, then it's again, all err, then err, your eyes will open and you'll see, you'll see the light and then you'll be, be the same person again. I would like that a lot. But no-one is going to say that, and no-one is able to say that. (Louis, T3)*

In Louis' account above, a sense of self compromised by feelings of irrational anger is observed. He did not feel like himself, and found himself in a dark and frightening place. In stark contrast to the initial transitional phase perceived by Julia and Iris, Louis saw himself as 'only staying stuck' with this compromised self. He longed to 'be the same person again' that he was before quitting, but did not know when, and even if, he would regain his sense of self. This sense of loss of identity in the absence of smoking appeared to obstruct identity change in Sophia and Louis, whereas a continued sense of self observed in Iris' and Julia's accounts appeared to facilitate this.

Identity change is facilitated by a sense of mastery of quitting.

The integration of nonsmoking in the way Iris and Julia perceived themselves also appeared to be facilitated by a sense of mastery in learning to live as nonsmokers. For example, in the third interview, Iris recalled how at work "You used to go outside to get some fresh air, to smoke. But you obviously don't do that anymore. So now I bring a book, or I surf the internet". Her use of the personal pronoun 'you' in the pleural and second person when recollecting her smoking behavior, and moving quickly to the singular and

first person 'I' to describe her behavior at work now, may reflect a distancing from the smoker identity. A process of learning to be a nonsmoker was also seen in Julia's account as she explained that the "habit [to smoke] begins to wear off" (T3). Both Iris and Julia felt proud of the progress that they had made with quitting, and gained self-confidence from this achievement. In the third interview for example after achieving two months abstinence, Julia explained: "I'm very proud of myself. It [smoking] is something that I don't need anymore, it's not necessary anymore. So it's some sort of achievement". This sense of pride appeared to be related to her new identity as a nonsmoker. For example, when Julia went to a restaurant with three smokers as 'the only nonsmoker in the group', she felt proud that she did not have to 'stand outside like that [to smoke]'. For Iris, self-confidence gained from quitting appeared to increase her belief in her ability to cope with other challenges as indicated in the account below:

Iris: You have more self-confidence now I think. You just know that you have a strong body. That you can handle more than you'd think.
Interviewer: Is that also the case more generally?
Iris: Yeah, you take it with you in other things.
Interviewer: Could you tell me what sort of things?
Iris: Just the daily things. Just at work, or err... That you take it with you.
Interviewer: So in general you feel stronger than before?
Iris: Yes. (Iris, T3)

In the account above, quit success appeared to make Iris feel strong, both physically ('strong body') and psychologically ('self-confidence'). The taking of self-confidence with her into daily life was probably facilitated by increased self-efficacy, following her self-discovery of an ability to cope with quitting that exceeded expectations. Later in the same interview, when Iris was asked what smoking now meant to her, she used a metaphor to describe how quitting smoking made her feel free:

It [smoking] is a closed period in my life. And that, you carry it with you, further. It [smoking] wears off more and more. And then, that, you spread your wings and you are completely loose, free again. (Iris, T3)

Iris explained that she struggled with low self-confidence in difficult periods in the past, and she felt that smoking was tied to low self-confidence. In her account above, she describes this period of her life as closed, and her sense of mastery of quitting appeared to allow her to become a more confident (nonsmoking) person. For both Iris and Julia therefore, transition towards a nonsmoker identity appeared to be facilitated by mastery over quitting.

Sophia and Louis however, continued to struggle to refrain from smoking. They did not gain confidence in quitting, but both described quitting as a 'battle' in the third interview, indicating that quitting was a sustained fight and required a high level of effort to maintain. In addition, they both remained strongly attracted to smoking. For example, in the third interview Louis said that "everything within me screams [sighs] smoking". The difficulty that they experienced with not smoking possibly made it more difficult to imagine themselves as nonsmokers or transition towards this.

2. Identity conflict resolution via psychological and behavioral strategies when quitting is unsuccessful or not attempted

The previous theme demonstrates that identity played an important role for the four participants who quit successfully over the course of the interviews. Identity issues were also observed in the six participants who did not quit successfully (see Table 1); all six participants found it difficult to picture themselves as nonsmokers (like Sophia and Louis). That is, although most of these participants experienced identity conflicts, they also lacked a positive future self as a nonsmoker that could serve as a goal in their quitting process. Various psychological barriers were observed that complicated identification with a future nonsmoking self. Furthermore, participants used psychological and behavioral strategies to protect a positive sense of self in the face of their difficulty to quit. These are discussed in turn below.

Barriers to identification with a positive future nonsmoking self.

Several barriers were observed that appeared to prevent the participants who did not quit successfully, or did not attempt to quit, from identifying with nonsmoking. These barriers are explored below.

Expectations of feeling incomplete without smoking.

Esther, Chris and Tom expected to feel incomplete without smoking and described a sense of loss of self, or of pleasure and purpose in life that they associated with quitting smoking (similar to Sophia and Louis). For example, Chris described his previous quit attempts as follows in the first interview:

> *Also err... previous quit attempts, yeah, it f-, it feels just like there's sort of err, you know, like, you're the bathroom floor and it, and it, and the err, bath mat with suckers is being pulled away from you, that's what is sort of feels like, that's very strange. Because it, yeah, it's very much err, linked to everything you do. (Chris, T1)*

Using the metaphor of a bathroom floor and a bath mat, Chris presents an image of two objects that had become conglutinated together via bathmat suckers. His experi-

ence of quitting smoking as the separation of two objects which require an aggressive force to overcome the sucker mechanisms suggests an immediate and strong sense of loss. Moreover, the positioning of smoking as the bath mat indicates that smoking does not easily let go of Chris, and, as smoking is linked to everything he does, it may have agency over his actions more broadly than the decision to smoke or not. This parallels Sophia's bothersome and dominant friend who is not easy to say goodbye to.

Perceptions of quitting as not fitting with certain identity aspects.

Chris, Esther and Brigitte had a sense that aspects of who or how they perceived themselves to be made it more difficult to quit. For example, Chris said: 'I am such a person who is so, I like to philosophize, you know. And sometimes I wonder whether that could very, very much, obstruct my quitting' (T2, smoker).

Perceptions of quitting as an insurmountable endpoint.

Furthermore, Esther and Brigitte in particular perceived quitting as very difficult and frightening. For example, in Brigitte's account in the second interview below she describes her expectations of quitting smoking:

> *If you don't have it [smoking] anymore, your [inaudible] drops, you become more tired, more stressed, etcetera. Then of course you're more vulnerable to those kind of things. So not having that anymore, you know, then it will completely go wrong. (…) It's a way to deal with stress. And taking that away, that results in stress. (Brigitte, T2)*

Brigitte expected that, without having the cigarette to help her cope with life's stresses, she would become more vulnerable to these. This would lead to the complete collapse of the situation in that 'it will completely go wrong'. Her stress levels would become uncontrollable, and thinking about this period resulted in distress in the present. She could not imagine that she would find other ways to deal with her stress and have a normal life as a nonsmoker, such that quitting was an insurmountable endpoint in her life. Similarly, in the second interview Esther said that she could not 'jump over' the period of quitting, suggesting that becoming a nonsmoker was inaccessible to her. In line with this, she talked about life as a nonsmoker as something that 'remains a little closed off'.

Experiences of difficulty quitting.

Whereas Esther and Brigitte were unable to picture themselves as nonsmokers at any time point, Karen had very positive expectations of herself as a nonsmoker in the first interview. She expected to feel "nice, fresh and healthy and err, and awake and err refreshed and happy, yeah, and more energetic" and this would be "fantastic, I will feel like I was again". This shows that she felt that quitting would allow her to be the person

that she felt that she essentially was; a nonsmoker. However, quitting was more difficult than she expected, and she did not talk as positively about becoming a nonsmoker anymore in the second and third interview. For example, when she was asked whether nonsmoking fitted with her in the second interview, she said: "Yes, if that could be, yes, yes. That's a big wish, yes, I go for it". Although she appeared determined to quit, she no longer articulated the positive expectations that she had before, and she was more hesitant about whether she could become a nonsmoker with this becoming a wish and thus something that she had no expectation to achieve, or control over. The diminishing expectations over time indicate the weakening of perceptions of herself as nonsmoker. Instead, she was afraid of becoming like the heavy smokers that she perceived to be 'hollow-eyed' and 'unhealthy' (Karen, T2):

> *My goodness, they [some heavy smokers] look so bad, you know, a very grey skin and very hollow-eyed… those dark grey teeth, I really don't want that! To me that is, it, an, it's an, an image of that's what I don't want! (Karen, T2)*

Picturing positive futures with smoking.

Chris and Tom pictured positive futures that involved smoking. Both were less inclined to think about life without smoking. For example, in the second interview Tom shows a desire to be an occasional smoker:

> *I know people, and they really smoke three cigarettes a day. They take the first cigarette at lunch, then one in the evening and one at the end of the evening, you know. That is their moment of happiness, they really sit down for it, and I have friends who smoke cigars, they have a cigar and it takes an hour (…) I find that fantastic [laughs]. I wish I could do that! (Tom, T2)*

Tom talked about occasional smoking as something that his friends 'can do' and that he wished that he 'could do', showing that he perceived it as an ability which he valued very much. He described occasional smoking as 'fantastic', showing that he wanted to become an occasional smoker himself. In addition to picturing a positive future, Chris also pictured a negative future when he would have become similar to 'dirty', 'sluggish' and 'ugly' long-term smokers: "I don't want to become like that! Please no! But I, I'm well on my way to become such a person" (Chris, T1). None of the six participants who did not quit successfully, or did not attempt to quit, appeared to hold positive expectations of who they may become if they would continue to smoke, nor if they would quit smoking.

Denial of relevance of smoking to self-perceptions.

Peter (at the first and second interview) and Brigitte (at all interviews) denied that smoking was relevant for their self-perception altogether. This will be further explored in the following theme.

Strategies to protect a positive sense of self when being unable to quit.

All six smokers who were unable to quit successfully or did not attempt to quit used strategies to protect a positive sense of self, and participants typically used more than one strategy. Psychological strategies observed were downward comparisons, self-affirmation, avoidance and denial. In addition, two behavioral strategies, hiding smoking to resolve social conflict and independence strategies, were used. These are each discussed below.

Psychological strategies.

Esther, Peter and Tom made downward comparisons with other smokers, by pointing out that they themselves were more decent or socially considerate (Esther) or less 'fat' (Peter) than other smokers. Similarly, Tom had lost a friend who died from lung cancer and was puzzled by what happened at his funeral:

> *Everyone was smoking. And the guy was lying on his stretcher two meters away from us [talks in disapproving voice]. Isn't that bizarre? (…) And we're joking and talking about his life, and no one talks about smoking! No one talks about the disease, how it happened, no one blames it [smoking]. (…) It keeps me occupied, yes, yes, yes. And smoking too, it keeps me occupied, keeps, and err, I am not a thoughtless smoker, I have, a friend of mine, and I can sit and talk with her, and she... smokes, and walks to the dish washer and smokes indoors, and smokes again and very much too, maybe even 2 packs a day... She always has a cigarette in her face. (Tom, T3)*

Following Tom's surprise and disapproval at the continued smoking of the funeral guests, of which he was one, he immediately presents a new smoker identity that made him look better in comparison to other smokers. That is, in contrast to a friend who smoked almost continuously, Tom was 'not a thoughtless smoker'. Comparing himself to his friend, whom he ridiculed by saying that she 'always has a cigarette in her face', probably made him feel better about himself.

Chris and Peter appeared to use self-affirmation strategies (i.e., focusing on one's positive characteristics) to protect a positive sense of self. For example, in the first interview Peter talked about continuing smokers, and his own continued smoking, as follows:

Peter: I can't imagine that there is anyone who does not want to quit smoking, who does smoke. I just don't believe that. So that means that [if you are smoking] *you can't quit smoking, in my opinion. So you don't have stamina, or endurance.*
Interviewer: Right. Does that apply to yourself as well?
Peter: Yes, definitely. Otherwise I would have quit smoking. Right? [laughs] *(…)*
Interviewer: What's that like, to think about that?
Peter: Tomorrow is another day? Yes. Nothing more, nothing less. I don't care so much, personally. I do so many other things, which I do do well, and with which I have endurance and which I finish and whatever. And one thing's not. Yes. Okay, so I'm not a hundred per cent, but I got far, with having my life on track. (Peter, T1)

Peter perceived his continued smoking as an indication that he lacked stamina, but he did not want to elaborate on this. He downplayed the importance of lacking stamina ('tomorrow is another day') and instead focused on everything that he succeeded in. These 'many other things' that went well allowed him to balance the negative impact of his continued smoking on his self-perception, and allowed him to perceive himself in a positive light. However, although Peter presented quitting smoking as trivial here, later on he said: "If I would quit and stick with it, it [life] will be more complete. (…) I might desire to have everything in my life on track" (T1), indicating that quitting smoking was important to him, and a key component of getting his life on track.

A number of participants showed avoidance or denial of a smoker identity. For example, in the second interview Esther said that "It's a confrontation with yourself. With a side of yourself [that smokes]. (…) So preferably, you always try to... push it to the background". As such, she acknowledged that 'a side' of her was a smoker, but she avoided thinking about this negative identity. Brigitte and Peter went a step further, and denied that smoking and nonsmoking were relevant for the way they perceived themselves in any way. This allowed removal (or reduction) of the identity threat associated with their continued smoking. For example, in the first interview Brigitte said:

I don't feel like it [smoking] is a part of me, who I am... No. It's part of what I do, but that doesn't necessarily mean that it's a fixed part of who I am. (Brigitte, T1)

For Brigitte, having an identity as a smoker meant that smoking was a stable part of who she was. She perceived smoking as a mere behavior, suggesting that she did not want smoking to define her as a person. Similarly, in the first interview Peter compared smoking to eating certain types of food, and asked "Does it fit with you to eat pasta? That's the same question, basically". However, between the second and third interview, Peter had reflected on his life and realized that he was unhappy with his smoking and his lifestyle more broadly:

Maybe things have fallen into place. Deep down I know that I'm not a smoker, really, I have always known that. I know that I have to quit smoking, that I want to again, I, that I just want, want to do sports normally and err, want to look and want to feel healthy and fit. I've always known that. (Peter, T3)

Whereas Peter denied that smoking was relevant to his identity in the first and second interview, he now admitted that his current smoking behavior had 'always' conflicted with his true sense of self. He experienced this realization positively, as 'things falling into place'. His realization was accompanied by a strong increase in his motivation to quit smoking. He now referred to quitting smoking as something that he 'wanted' to do, whereas quitting had been something that he 'had to' do up until this point. For Peter, continued smoking was incompatible with his new awareness of his negative identity as a smoker.

Behavioral strategies.

Finally, two different behavioral strategies were described by Esther, Karen and Brigitte. Esther and Karen both attempted to resolve social conflict by hiding their smoking, and Brigitte employed strategies to feel more independent.

Esther felt that smoking conflicted with her professional identity, and believed that her colleagues would think less of her if they would see her smoking. Esther would therefore 'sneak around' and 'crawl away like an ashamed dog' (T3) if she was on her way outside to smoke, in order to prevent negative judgments from coworkers. Using the dehumanized metaphor of an 'ashamed dog crawling away' possibly reflects a fear of being judged as being without human agency and succumbing to primal urges of an intelligent animal (i.e. an animal with an awareness of expected behavior, capable of feeling shame). Similarly, Karen took care to buy her cigarettes from different shops as she explains: "you don't want to be recognized [by the shop owner], that you're such a stupid cow that you're smoking" (T3). Karen also took steps to avoid association with the group of smokers (by anyone), and she said that "at a barbecue, there's the group of smokers, I am standing there [far away from the smokers]. So, I'm not going to join them" (T3).

Brigitte attempted to increase her sense of control over smoking, by deliberately buying her cigarettes separately for each day rather than at once. She described this as 'my way to control it [smoking]', although at the same time she recognized this to be an 'excuse' and a way of 'fooling herself' (T3).

Results of the follow-up

With the exception of Peter, all participants completed the online follow-up survey approximately 20 months after their final interview (T3). Current smoking status, duration of and time since most recent quit attempt since T3 and self-label are presented in Table 3. While four participants had successfully quit at T3 (i.e., Iris, Julia, Sophia and Louis)

Table 3. Follow-up smoking status, quit attempts and identity.

Name	Months to follow-up	Smoking status (#cigarettes p/ day)	Duration and recency most recent quit attempt since T3	Self-label
Iris	19	Abstinent	Abstinent since T3	"Ex-smoker"
Julia	18	Abstinent	Abstinent since T3	"Nonsmoker who used to smoke"
Sophia	19	Smoking (10)	No quit attempt	"Someone for whom relapse looms time and time again"
Louis	18	Smoking (20)	3 weeks (17 months ago)	"Fine"
Karen	18	Smoking (6)	3 days (16 days ago)	"A nonsmoker"
Tom	19	Smoking (15-20)	No quit attempt lasting >24 hours	"Someone who enjoys it but does not have the strength to quit"
Chris	18	Smoking (20)	1.5 day (237 days ago)	"Someone who is addicted and is captured in the addiction"
Esther	28	Smoking (20)	No quit attempt	"An addict"
Brigitte	28	Smoking (20)	No quit attempt	"Someone who seems to need a cigarette to be able to concentrate"

No follow-up data were available for Peter.

only two reported continuous abstinence at the follow-up survey. These were Julia and Iris, the two participants who in their interview accounts demonstrated identity change toward a nonsmoker identity. Sophia and Louis however, who presented a resistant smoker identity in their interviews, had relapsed back to smoking, and smoked 20 and 10 cigarettes per day, respectively. At follow-up, Iris labeled herself as an 'ex-smoker', and Julia labeled herself as a 'nonsmoker who used to smoke'. Instead, Sophia labeled herself in terms of inevitable relapse, "someone for whom relapse looms time and time again", and Louis refrained from defining himself in terms of smoking and nonsmoking altogether.

In addition, none of the participants who were smokers at T3 (i.e., Karen, Tom, Chris, Esther and Brigitte) were abstinent at follow-up (follow-up data was unavailable for Peter). Most of them still perceived themselves in terms of smoking and addiction. Karen, however, perceived herself as a nonsmoker, although she had not (yet) been successful in quitting. As such, her identity conflicted with her smoking behavior. She had attempted to quit very recently, suggesting that she tried to behave in line with her self-perception as a nonsmoker.

DISCUSSION

This study is the first in-depth longitudinal qualitative study that explores identity change processes in quitting smoking. Each of ten smokers with an intention to quit were interviewed three times, approximately one month apart, and data were analyzed using the Interpretative Phenomenological Analysis (IPA) approach (Smith et al., 2009). The approach taken in this study allowed for the in-depth exploration of how participants made sense of their experiences with smoking of quitting, and how this related to their sense of self. Moreover, the longitudinal nature allowed direct exploration of the experience of identity during the processes of quitting. The results showed two themes in relation to identity: 1) Identity change toward 'nonsmoker' makes it easier to quit, and 2) Identity conflict resolution via psychological and behavioral strategies when quitting is unsuccessful or not attempted.

This study provided new insight regarding identity change dynamics over time, and the processes that appeared to facilitate or obstruct identity change. Of the four smokers who quit smoking successfully over the course of the interviews, identity change toward becoming a nonsmoker was indicated in two people, whereas the other two continued to perceive themselves as a 'smoker who does not smoke', showing that their identity remained unchanged by their quitting. Importantly, it appears that quitting was much easier for those who increasingly came to perceive themselves as nonsmokers. Similarly, the study by Vangeli and West (2012) suggested that a lack of identity change toward nonsmoker in some participants made it more difficult for them to stay abstinent. The identity as a 'smoker who does not smoke' was also observed in an ethnographic study among smoking cessation group participants (Nachtigal & Kidron, 2015), but was in that study considered as a means to resist the temptation to smoke and thereby empower the identity as a nonsmoker, something our results do not seem to support. Importantly, extending previous work, follow-up results from the current study were in line with the identity processes observed in the interviews, as only those for whom identity change was observed had gained long-term abstinence, whereas those whose quitting did not seem to be accompanied by identity change had relapsed. The findings of the current study thus suggest that nonsmoking needs to become incorporated in ex-smokers' self-perceptions in order to reach stable abstinence.

Results further suggest that the perception of permeable identity boundaries, a sense of identity continuity and a sense of mastery of quitting enabled identity change in the two participants who increasingly perceived themselves as nonsmokers over time. The perception of smoker and nonsmoker identities as not clearly distinct but flexible (e.g., the smoking nonsmoker) appeared to allow navigation between the identities more easily. Permeability across identity boundaries was possibly supported by a transitional recovery identity (e.g. rehab phase or detoxed smoker). This permeability relates to the

conceptualization of smoking-related identity as fluid, as was proposed by Vangeli and West (2012) who found that ex-smokers oscillated between the identities of nonsmoker and smoker.

Furthermore, identity change in these participants seemed to be facilitated by a sense of identity continuity, such that, in the process of change, they essentially stayed the same person. In contrast, the two participants who did not show identity change and relapsed by follow-up experienced a sense of loss of self without smoking, and said that they were 'not myself' or 'amputated' without smoking. Similar experiences were reported by participants in other studies, who reported a 'voided self' without smoking (Nachtigal & Kidron, 2015) or a sense of loss that resembled 'bereavement' (Vangeli & West, 2012). Importantly, a lower sense of identity continuity is associated with worse psychological well-being (Sokol & Serper, 2016), and follow-up results of the current study suggest that it may be a risk for relapse (Bottorff et al., 2000). In addition, identity change appeared to be facilitated by a sense of mastery of quitting in the two participants who increasingly perceived themselves as nonsmokers. This resonates with observations by Vangeli and West (2002) and Luck and Beagan (2015). For example, Luck and Beagan (2015) found that 'favorable experiences and perceptions of not smoking (…) nurtured a positive identity that reinforced successful transition' (p. 191). Correspondingly, identity shift theory (Kearney & O'Sullivan, 2003) suggests that successful behavior change (which may be reflected in a sense of mastery) may facilitate identity change.

Identity also played a role in the six participants who attempted to quit, but relapsed, or did not attempt to quit. For various reasons, all of these participants had difficulty picturing themselves as nonsmokers. Although they all had an intention to quit, and most did not hold a positive identity as a smoker, the lack of a future nonsmoker identity seemed to impair smoking cessation. In line with this, none of them had quit successfully at follow-up, and most of them still perceived themselves in terms of smoking and addiction. This finding corresponds with previous work, which showed that smokers need a strong nonsmoker identity, rather than a weak smoker identity, in order to quit smoking (Meijer et al., 2015; Meijer, Gebhardt, Van Laar, Kawous et al., 2016; Meijer, Van den Putte et al., 2017).

The difficulty with quitting experienced by these continuing smokers appeared to constitute a threat to a positive sense of self. Several psychological and behavioral strategies were observed that may protect a positive identity in the face of (perceived) inability to quit. On a psychological level, participants used downward comparisons with smokers who were worse off than themselves, used self-affirmation (i.e., focusing on accomplishments or positive experiences instead of their difficulty quitting), avoided thinking about their negative identity, and denied the impact of smoking on their self-perception. With regard to behavioral strategies, some participants hid their smoking from others to resolve social conflict (Luck & Beagan, 2014), or engaged in strategies to

gain a sense of independence of smoking. Some of these strategies, such as downward comparisons (Vohs & Heatherton, 2004) and self-affirmation (Derks, Scheepers, Van Laar, & Ellemers, 2011; Sherman, 2013) have also been reported in the psychological literature more generally as ways to cope with identity threat. Both strategies are considered to allow for a more positive perception of the self by diverting attention away from the threat, which then has less impact on identity. However, such strategies may be disadvantageous in the long term as they decrease the need for (healthy) behavioral change (Hoek, Maubach, Stevenson, Gendall, & Edwards, 2013).

This study has limitations. While the importance of identity change processes was confirmed through follow-up, it is possible that at follow-up participants provided socially desirable answers as it did not include face-to-face contact. However, given that the majority of participants indicated that they smoked (vs. not), answers do not appear to be biased in a socially desirable direction. Relatedly, biochemical verification of smoking status was not used. Although this would provide a reliable assessment of smoking status, it might have complicated rapport between participants and the interviewer. Furthermore, as is inherent to qualitative research, the findings are not intended to be generalizable to the complete population of smokers who intend to quit. It would be beneficial to conduct similar qualitative studies among different smokers. However, the experiential approach taken in this study led to valuable insights regarding identity change processes that cannot be obtained with quantitative methods. For example, permeable identity boundaries are more difficult to capture with quantitative methods such as questionnaires. Finally, in accordance with the 'double hermeneutic' employed in IPA (Smith et al., 2009), participants' interpretations of their experiences were interpreted by the authors who had their own assumptions and were interested in how sense of identity may change among smokers who are in the process of quitting. While this necessarily shaped the findings - other themes that are not related to identity can possibly be found in the data as well - the continuous focus on grounding interpretations in the data, and discussions between the authors during the analytic process ensured the findings closely reflected the participant accounts.

Notwithstanding these limitations, this longitudinal study provided an in-depth understanding of identity change during the process of quitting smoking. The findings indicated that change toward a nonsmoker identity may be necessary for successful quitting in the long-term. In addition, results suggested that permeable identity boundaries, a continuous sense of self, and a sense of mastery of quitting may facilitate identity change. Given these results, future research investigating ways to help smokers to perceive themselves increasingly as nonsmokers appears highly indicated, for example through writing exercises about the future self (Meijer, Gebhardt, Van Laar, Van den Putte, & Evers, 2017). Given that most smokers are motivated to quit smoking in the future, but relatively few of them succeed in quitting (Nationaal Expertisecentrum

Tabaksontmoediging, 2015), interventions focused on identity change are likely to help more smokers to quit successfully.

REFERENCES

Bottorff, J. L., Johnson, J. L., Irwin, L. G., & Ratner, P. A. (2000). Narratives of smoking relapse: The stories of postpartum women. *Research in Nursing and Health, 23*(2), 126-134.

Brown, J. M. (1996). Redefining smoking and the self as a nonsmoker. *Western Journal of Nursing Research, 18*(4), 414-428. doi: 10.1177/019394599601800404

Derks, B., Scheepers, D., Van Laar, C., & Ellemers, N. (2011). The threat vs. challenge of car parking for women: How self- and group affirmation affect cardiovascular responses. *Journal of Experimental Social Psychology, 47*(1), 178-183. doi: 10.1016/j.jesp.2010.08.016

Hertel, A. W., & Mermelstein, R. J. (2016). Smoker identity development among adolescents who smoke. *Psychology of Addictive Behaviors, 30*(4), 475-483. doi: 10.1037/adb0000171

Hoek, J., Maubach, N., Stevenson, R., Gendall, P., & Edwards, R. (2013). Social smokers' management of conflicted identities. *Tobacco Control, 22*(4), 261-265. doi: 10.1136/tobaccocontrol-2011-050176

Høie, M., Moan, I. S., & Rise, J. (2010). An extended version of the theory of planned behavour: Prediction of intentions to quit smoking using past behavior as moderator. *Addiction Research & Theory, 18*(5), 572-585. doi: 10.3109/16066350903474386

Kearney, M. H., & O'Sullivan, J. (2003). Identity shifts as turning points in health behavior change. *Western Journal of Nursing Research, 25*(2), 134-152. doi: 10.1177/0193945902250032

Luck, K., & Beagan, B. (2014). Occupational transition of smoking cessation in women: "You're restructuring your whole life". *Journal of Occupational Science, 22*(2), 183-196. doi: 10.1080/14427591.2014.887418

Meijer, E., Gebhardt, W. A., Dijkstra, A., Willemsen, M. C., & Van Laar, C. (2015). Quitting smoking: The importance of nonsmoker identity in predicting smoking behavior and responses to a smoking ban. *Psychology & Health, 30*(12), 1387-1409. doi: 10.1080/08870446.2015.1049603

Meijer, E., Gebhardt, W. A., Van Laar, C., Kawous, R., & Beijk, S. C. (2016). Socio-economic status in relation to smoking: The role of (expected and desired) social support and quitter identity. *Social Science & Medicine, 162*, 41-49. doi: 10.1016/j.socscimed.2016.06.022

Meijer, E., Gebhardt, W. A., Van Laar, C., Van den Putte, B., & Evers, A. W. M. (2017). Strengthening quitter self-identity and expected social support for quitting smoking: An experimental study. *Manuscript submitted for publication*.

Meijer, E., Van den Putte, B., Gebhardt, W. A., Van Laar, C., Bakk, Z., Dijkstra, A., . . . Willemsen, M. C. (2017). Reciprocal effects of identities and smoking behavior: Findings from the ITC Netherlands Survey. *Manuscript submitted for publication*.

Meijer, E., Van Laar, C., Gebhardt, W. A., Fokkema, M., Van den Putte, B., Dijkstra, A., . . . Willemsen, M. C. (2017). Identity change among smokers and ex-smokers: Findings from the ITC Netherlands survey. *Psychology of Addictive Behaviors.* Online first.

Moan, I. S., & Rise, J. (2005). Quitting smoking: Applying an extended version of the theory of planned behavior to predict intention and behavior. *Journal of Applied Biobehavioral Research, 10*, 39-68.

Moan, I. S., & Rise, J. (2006). Predicting smoking reduction among adolescents using an extended version of the theory of planned behavior. *Psychology & Health, 21*(6), 717-738. doi: 10.1080/14768320600603448

Nachtigal, A., & Kidron, C. A. (2015). Existential multiplicity and the late-modern smoker: negotiating multiple identities in a support group for smoking cessation. *Sociology of Health and Illness, 37*(3), 452-467. doi: 10.1111/1467-9566.12220

Nationaal Expertisecentrum Tabaksontmoediging. (2015). *Roken: een aantal feiten op een rij*. Utrecht: Trimbos Instituut.

Sherman, D. K. (2013). Self-affirmation: Understanding the effects. *Social and Personality Psychology Compass, 7*(11), 834-845.

Smith, J. A. (1999). Identity development during the transition to motherhood: An interpretative phenomenological analysis. *Journal of Reproductive and Infant Psychology, 17*(3), 281-299.

Smith, J. A., Flowers, P., & Larkin, M. (2009). *Interpretative phenomenological analysis: Theory, method and research*. London: SAGE.

Smith, J. A., Spiers, J., Simpson, P., & Nicholls, A. R. (2016). The psychological challenges of living with an ileostomy: An interpretative phenomenological analysis. *Health Psychology*, online first. doi: 10.1037/hea0000427

Snelgrove, S., Edwards, S., & Liossi, C. (2013). A longitudinal study of patients' experiences of chronic low back pain using interpretative phenomenological analysis: changes and consistencies. *Psychology & Health, 28*(2), 121-138. doi: 10.1080/08870446.2011.630734

Sokol, Y., & Serper, M. (2016). Temporal self appraisal and continuous identity: Associations with depression and hopelessness. *Journal of Affective Disorders*, online first. doi: 10.1016/j.jad.2016.10.033

Spiers, J., Smith, J. A., & Drage, M. (2015). A longitudinal interpretative phenomenological analysis of the process of kidney recipients' resolution of complex ambiguities within relationships with their living donors. *Journal of Health Psychology, 21*(11), 2600-2611. doi: 10.1177/1359105315581070

Tombor, I., Shahab, L., Brown, J., & West, R. (2013). Positive smoker identity as a barrier to quitting smoking: findings from a national survey of smokers in England. *Drug and Alcohol Dependence, 133*(2), 740-745. doi: 10.1016/j.drugalcdep.2013.09.001

Tombor, I., Shahab, L., Brown, J., Notley, C., & West, R. (2015). Does nonsmoker identity following quitting predict long-term abstinence? Evidence from a population survey in England. *Addictive Behaviors*, *45*, 99-103.

U. S. Department of Health and Human Services (2014). *The health consequences of smoking - 50 years of progress: a report of the Surgeon General.* Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.

Vangeli, E., & West, R. (2012). Transition towards a 'nonsmoker' identity following smoking cessation: an interpretative phenomenological analysis. *British Journal of Health Psychology, 17*(1), 171-184. doi: 10.1111/j.2044-8287.2011.02031.x

Vohs, K. D., & Heatherton, T. F. (2004). Ego threat elicits different social comparison processes among high and low self-esteem people: Implications for interpersonal perceptions. *Social Cognition, 22*(1), 168-191.

West, R. (2006). *Theory of addiction*. Oxford: Blackwell, Addiction Press.

Wilson, S., Cunningham-Burley, S., Bancroft, A., Backett-Milburn, K., & Masters, H. (2007). Young people, biographical narratives and the life grid: young people's accounts of parental substance use. *Qualitative Research, 7*(1), 135-151. doi: 10.1177/1468794107071427

APPENDIX. FOLLOW-UP QUESTIONNAIRE

1. Do you smoke nowadays?
   - Yes
   - No, I do not smoke anymore

If question 1 = Yes

2. How many cigarettes do you smoke on average per day?
3. Did you attempt to quit since the last interview? This refers to serious quit attempts when you did not smoke for at least 24 hours.
   - Yes
   - No

If question 3 = Yes

4. When was your most recent quit attempt of at least 24 hours? Try to indicate this as specifically as possible.
5. How long did you quit smoking during your most recent quit attempt? Try to indicate this as specifically as possible.

If question 1 = No

6. For how long have you quit smoking? Try to indicate this as specifically as possible.
7. Did you ever smoke since the last interview? If yes, when?

All

8. Do you ever use an e-cigarette?
   - Yes, I use an e-cigarette with nicotine
   - Yes, I use an e-cigarette without nicotine
   - No
9. The next question is about how you see yourself. How do you see yourself in relation to smoking? Try to provide a brief description.

I see myself as.. (textbox)

CHAPTER 6

A LONGITUDINAL STUDY INTO THE RECIPROCAL EFFECTS OF IDENTITIES AND SMOKING BEHAVIOR: FINDINGS FROM THE ITC NETHERLANDS SURVEY

Eline Meijer, Bas van den Putte, Winifred A. Gebhardt, Colette van Laar, Zsuzsa Bakk, Arie Dijkstra, Geoffrey T. Fong, Robert West, and Marc C. Willemsen

ABSTRACT

Identity is important for smoking behavior and cessation. In this longitudinal study we examined the reciprocal relations between identity constructs (i.e., smoker self-identity, quitter self-identity and smoker group-identity), intention to quit and smoking behavior among a large sample of smokers and ex-smokers, using cross-lagged structural equation modeling. Moreover, we tested whether these relations differed between socio-economic status (SES) groups. Results showed that intention to quit and smoking behavior consistently predicted identity change. Quitter self-identity was more important than smoker self- and group-identity in predicting (changes in) smoking behavior and intention to quit. Relationships did not differ between SES-groups. The findings were replicated using a cross validation sample. The results provide important insights into the relationships between identity and smoking cessation. Behavior appears more important for identity change than identity for behavior change. Strengthening identification with quitting is more crucial for quit success than decreasing smoker identities.

Keywords. identity; socio-economic status; smoking cessation; intention to quit; smokers; ex-smokers.

People are motivated to behave in line with their identity. PRIME theory (PRIME stands for plans, responses, impulses, motivation and evaluation) states that identity affects behaviour more strongly than other representations such as specific outcome expectations (West, 2006). Identity can be based on behaviours, such that particular behaviours are important for the way that people perceive themselves (i.e., self-identity). A deeply entrenched identity provides a basis for behavioural stability. In addition to identification with behaviours, the social identity approach states that people may derive an important part of who they are from their memberships in groups or social categories (Tajfel & Turner, 1979; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987), that is, their social identity (or group-identity). People are likely to behave according to the group's social norms when their group identification is strong (Tajfel & Turner, 1979, 1986). People not only hold perceptions of the self in the present, but in addition have views on who they may become in the future (Barreto & Frazier, 2012).

Research on smoking and identity typically examines "self-identity" and "group-identity". Self-identity in relation to smoking refers to the importance of behaviours such as smoking and quitting for how an individual perceives himself (e.g., 'Smoking is important for who I am'). Whereas group-identity is very similar to the construct of social identity, self-identity can be seen as a part of personal identity as defined in the social identity approach (i.e., an individuals' perception of the self as a unique person that is different from others). Self- and group-identities are important for smoking behaviour, but it is unclear whether identities affect smoking behaviour, or vice versa, or that identity and smoking behaviour are reciprocally related.

Most studies on smoking and identity focused on identity as a precursor of behaviour. This work has clearly shown that identity is important for quit intentions (an important predictor of quitting; Smit, Hoving, Schelleman-Offermans, West, & De Vries, 2014; Vangeli, Stapleton, Smit, Borland, & West, 2011) and smoking and quitting behaviour, even when controlling for important factors such as nicotine dependence (Hertel & Mermelstein, 2012; Høie, Moan, Rise, 2010; Meijer, Gebhardt, Dijkstra, Willemsen, & Van Laar, 2015; Meijer, Gebhardt, Van Laar, Kawous, & Beijk, 2016; Moan & Rise, 2005, 2006; Tombor, Shahab, Brown, & West, 2013; Van den Putte, Yzer, Willemsen, & De Bruijn, 2009). Smokers who identify more with smoking as a behaviour or with the group of smokers have weaker quit intentions, are less likely to quit, and may even increase their smoking. Conversely, those who identify more with quitting, non-smoking, or non-smokers have stronger quit intentions and are also more likely to attempt to quit. Importantly, these studies typically focus on smokers, not ex-smokers. In line with the above findings, the Social Identity Model of Cessation Maintenance (Frings & Albery, 2015) and the Social Identity Model of Recovery (Best et al., 2015) propose that stronger (social) identification as 'recovering addict' facilitates recovery from addiction. In sum, previous work suggests that identity affects smoking behaviour (West, 2006).

However, other studies suggest a reversed causal order: people base their self-conceptualizations on behaviours that they frequently engage in, such that the behaviour is perceived to show who they are (Bem, 1972). With regard to smoking, two studies indeed suggest that smoking behaviour affects smoking-related identities. Specifically, after participating in a smoking cessation program, successful ex-smokers came to perceive themselves more as non-smokers and less as smokers (Shadel, Mermelstein, & Borrelli, 1996). Moreover, increases in smoking behaviour are associated with subsequent increases in smoker self-identity among adolescent smokers (Hertel & Mermelstein, 2016).

Finally, retrospective qualitative studies showed that smoking became increasingly less important to the way ex-smokers perceived themselves as they learned to live without smoking (Brown, 1996; Luck & Beagan, 2015; Vangeli & West, 2012), suggesting that identity change and smoking behaviour change go hand in hand (identity shift theory; Kearney & O'Sullivan, 2003). Similarly, identity theory states that people act in line with their identity, but at the same time identity may change to match behaviour (Stets & Burke, 2003). Moreover, the social identity model of recovery (Best et al., 2015) acknowledges that successful behaviour change may reinforce recovery identities.

Evidence suggests that identity dynamics differ with socio-economic status (SES). Another large scale longitudinal study based on the ITC Netherlands Survey showed that lower-SES smokers (vs. middle and higher-SES) and lower-SES ex-smokers (vs. middle-SES) identify more with smoking (Meijer et al., 2017). In addition, higher-SES smokers and ex-smokers move away from smoking and toward quitting more quickly than their lower-SES counterparts. Correspondingly, other work showed that lower-SES smokers have more difficulty picturing themselves as non-smokers than higher-SES smokers, whereas the relation between non-smoker self-identity and quit intention was stronger among lower-SES than higher-SES smokers (Meijer et al., 2015). This suggests that non-smoker self-identities may be particularly key for smoking cessation among lower-SES smokers, although SES did not moderate relations between identity and quit intention in another study (Meijer et al., 2016). In sum, previous work showed that identity is important for smoking behaviour and vice versa, and that other variables such as SES may possibly influence this relationship. However, it is as yet unclear *how* identity changes and behaviour changes over time are associated. In addition, as studies on identity and quit intention are often cross-sectional, it is unknown whether identity precedes behavioural intention or the other way around.

The current longitudinal study examined and compared relations between identity constructs (i.e., smoker self-identity, quitter self-identity and smoker group-identity), quit intention and smoking behaviour among a large sample of smokers and ex-smokers. Cross-lagged structural equation modelling was applied to investigate and compare these relations and cross validation was used to assess generalizability of results. The following research questions were addressed (RQs):

1. Do smoker self-identity, quitter self-identity and smoker group-identity predict changes in smoking behaviour over time (RQ1)?
2. Does smoking behaviour predict changes in smoker self-identity, quitter self-identity and smoker group-identity over time (RQ2)?
3. Do quitter self-identity, smoker self-identity and smoker group-identity predict changes in quit intention over time (RQ3)?
4. Does quit intention predict changes in quitter self-identity, smoker self-identity and smoker group-identity over time (RQ4)?
5. Do identity constructs and quit intention uniquely predict smoking behaviour one year later (RQ5), and are relations between identity (intention) and smoking behaviour mediated by intention (identity; RQ6)?
6. Do associations over time between identity, quit intention, and behaviour differ between lower, middle and higher-SES groups (RQ7)?

METHOD

Participants

This study is part of the International Tobacco Control Policy Evaluation Project (www.itcproject.org) (Fong et al., 2006). Data used for the current study were collected annually in the International Tobacco Control (ITC) Netherlands Survey from 2009 to 2014 (from now waves 1-6, respectively). Participants were aged 16 or older, and were smokers or ex-smokers at enrollment. Participants who smoked at least monthly and had smoked at least 100 cigarettes in their lifetime were considered as smokers, and those who had smoked monthly and had smoked at least 100 cigarettes but were now abstinent were considered as ex-smokers. Participants could participate in subsequent waves regardless of smoking status. Participants who dropped out of the study were replaced, from the same sampling frame, in order to maintain sample size. Surveys were administered online or by telephone by a research firm. The ITC Netherlands Surveys were cleared for ethics by the Human Research Ethics Committee of the University of Waterloo. The sample is representative of the Dutch smokers population (Nagelhout et al., 2010, 2016).

Initial analyses

For the initial analyses, data from 2012 and 2014 (waves 4-6) were used. Given changes in antismoking regulation in the Netherlands over time, these data were considered more relevant than less recent data. The initial findings were cross validated using data from waves 1-3. Wave 4 had 2,022 participants (1,604 smokers), wave 5 had 1,970 participants (1,531 smokers) and wave 6 had 2,008 participants (1,569 smokers). For the analyses the 1,389 participants who participated in all three waves were used (69% of wave 4

participants). Responders (i.e., wave 4 participants who also completed waves 5 and 6) and drop-outs (i.e., those who did not complete waves 5 and 6) did not differ significantly on SES, smoking status, identity constructs, quit intention, cigarettes per day and quit success at wave 4. Responders were more likely to be female and were older than drop-outs (see Appendix A). Participants were included in the analyses if they had full data for all variables in the respective model (see Statistical Analyses; see Appendix B for participant characteristics).

Cross validation.

The models were cross validated using data from 2009 to 2011 (waves 1-3), with 2,012 participants at wave 1 (1,763 smokers), 2,060 participants at wave 2 (1,723 smokers), and 2,101 participants at wave 3 (1,672 smokers). Of the 2,012 participants at wave 1, 1,104 (55%) also participated in waves 2 and 3. Responders and drop-outs did not differ significantly on smoking status (smoker/ex-smoker), age, identity constructs, quit intention and quit success at wave 1. Responders were more likely to be female, to have lower SES, and to smoke more cigarettes per day than drop-outs (see Appendix C). Of the participants who were included in the initial samples for Model 1 and 2, 400 (39%) and 255 (33%), respectively, were also included in the cross-validation samples for these models.

Measures

Identity constructs and quit success were measured among smokers and ex-smokers, and quit intention was measured among smokers only.

Identity (waves 4-6).

Variables were recoded such that higher scores indicated stronger identity. Scales were made for each identity construct and wave by averaging scores on the individual items.

Smoker self-identity.

Smoker self-identity was measured with two items for smokers and ex-smokers: 'To [continue smoking/start smoking again] would fit with who you are' and 'To [continue smoking/start smoking again] would fit with how you want to live', with answers ranging from [1] 'strongly agree' to [5] 'strongly disagree' (r = .82, .85 and .85 at waves 4, 5 and 6, respectively). Smoker self-identity was missing for 89, 86 and 87 participants at waves 4, 5 and 6, respectively.

Quitter self-identity.

Similarly, quitter self-identity was measured with two items for smokers and ex-smokers, e.g. 'To [quit smoking/stay quit] within the next six months would fit with who you are',

with answers ranging from [1] 'strongly agree' to [5] 'strongly disagree' (r = .83, .84, and .83 at waves 4, 5 and 6, respectively). Quitter self-identity was missing for 114, 134 and 138 participants at waves 4, 5 and 6, respectively.

Smoker group-identity.

Smoker group-identity was measured with two items, i.e. for smokers: 'You feel connected to other (omitted for ex-smokers) smokers' and 'You feel at home in the company of other (omitted for ex-smokers) smokers', with answers ranging from [1] 'strongly agree' to [5] 'strongly disagree' (r = .62, .63, and .64 at waves 4, 5 and 6, respectively). Smoker group-identity was missing for 61, 58 and 62 participants at waves 4, 5 and 6, respectively.

Quit success (waves 4-6).

Smoking behaviour was measured as quit success. Participants were asked whether they had attempted to quit in the last year, and if so, whether they were smoking again. Participants who had not attempted to quit or had relapsed were asked whether they smoked daily, at least weekly, or at least monthly. Participants who were abstinent were asked when their current quit attempt had started. This information was used to calculate the quit success variable, with [1] 'daily smoker', [2] 'weekly smoker', [3] 'monthly smoker', [4] 'quit in the last month', [5] 'quit one to six months ago', [6] 'quit more than six months ago', and [7] 'abstinent since last survey'. Quit success had no missing values. Results for Model 1 and Model 2 (see Statistical analyses) were very similar when quit success was recoded into [1] daily smoker, [2] weekly/monthly smoker, and [3] quit in the last months/one to six months ago/more than six months ago, or abstinent since last survey. Quit success was not analyzed separately as smoking frequency (smokers) and abstinence duration (ex-smokers), because this precludes analysis of transitions from smoking to abstinence.

Quit intention (waves 4 and 5).

Quit intention was measured with one item, i.e., 'Are you planning to quit smoking within the next 6 months?' Answer categories ranged from [1] 'very likely' to [5] 'very unlikely'. This variable was recoded, such that higher scores indicated stronger quit intention. Quit intention had 23 and 18 missing values at waves 4 and 5, respectively, among participants who smoked at both waves.

SES (wave 4).

Highest attained educational level was used to measure SES (Schaap & Kunst, 2009). Answer categories ranged from [1] 'no degree' to [7] 'university master', and [8] 'do not know/do not want to say' (recoded as missing). In accordance with other ITC papers,

SES was converted into lower (no degree, lower pre-vocational secondary education), middle (middle pre-vocational education, secondary education second stage) and higher SES (senior general secondary education and pre-university education, higher professional education and university bachelor, university master). SES was missing for 15 participants at wave 4.

Statistical Analyses

Analyses were performed in R statistical software (R Core Team, 2014), using the sem function of the lavaan package version 0.5-20 (Rosseel, 2012). As some variables were not normally distributed, robust maximum likelihood estimation (MLR) was used. In addition, fixed.x was set to false to incorporate covariances between exogenous variables. For the remainder, the default settings of the lavaan sem function were used.

Two separate models were fitted, using data from waves 4-6. First, cross-lagged relations between identity constructs and quit success were examined in Model 1 (see Figure 1 for the final model; RQ1 and RQ2). Identity constructs and quit success were measured at waves 4, 5 and 6. In addition, cross-lagged relations between identity constructs and quit intention were examined in Model 2, which is shown as the cross-lagged part in Figure 2 (final model; RQ3 and RQ4). Moreover, in the prediction part of Model 2, identity constructs and quit intention were used to predict quit success (RQ5) and the significance of indirect paths was tested (i.e., mediation; RQ6). Mediation was not tested in Model 1 because there was no outcome variable. For Model 2 identity constructs and quit intention from waves 4 and 5 were used, and quit success from wave 6. Quit intention was measured among smokers only, such that only participants who smoked at waves 4 and 5 were included in this model. Participants could be smokers or ex-smokers at wave 6.

Both models (i.e., Model 1 and 2) were estimated in several steps (Martens & Haase, 2006) in order to find the best fitting model. First, baseline models were fitted with autoregressions and covariances (between variables assessed at the same wave only; Model A), autoregressions and covariances plus cross-lagged paths from identity to quit success/intention (Model B), autoregressions and covariances plus cross-lagged paths from quit success/intention to identity (Model C), and with autoregressions and covariances plus reciprocal cross-lagged paths from quit success/intention to identity, and vice versa (Model D). The inclusion of autoregressive effects allowed for prediction of *change* in one construct by another construct. To examine whether model fit differed significantly between the models χ^2-difference tests were used. AIC values were used to compare the models, with lower AIC values indicating better fit. Moreover, the significance of model parameters and χ^2, CFI, RMSEA, SRMR, and AIC were examined to assess model fit. Chi-square, CFI and RMSEA values were robust values (SRMR and AIC are not corrected when robust estimation is used). Non-significant model χ^2-values indicate that

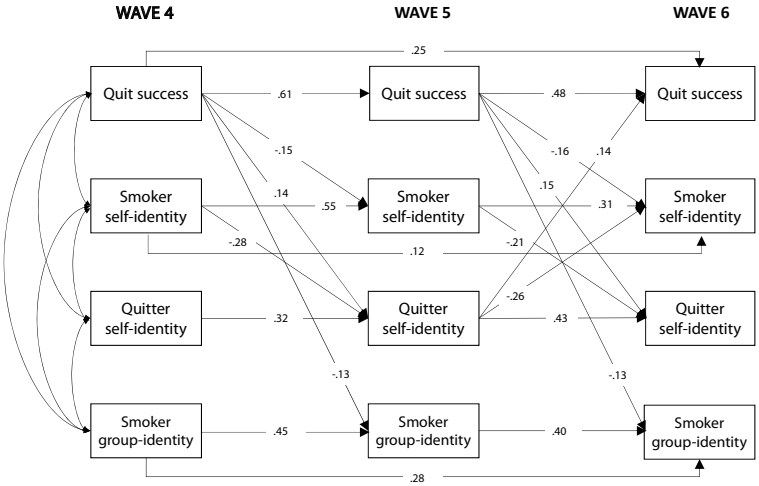


Figure 1. Graphic representation of final Model 1 (quit success and identity) with standardized coefficients (N = 1036). All paths are significant at $p < .05$. For ease of presentation, covariances at waves 5 and 6 are not shown.

the model does not deviate significantly from the data, although χ^2-values are often significant in large samples. In addition, according to Hu and Bentler (1999), CFI values ≥ .95, SRMR values ≤ .08, and RMSEA values ≤ .06 indicate good fit.

Second, the best fitting model (i.e., Model A, B, C or D) was selected and non-significant regression paths and covariances were removed to make the model more parsimonious,

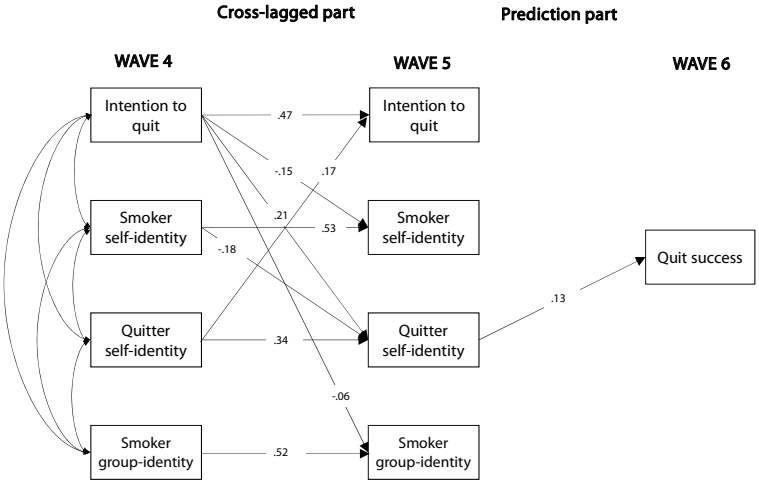


Figure 2. Graphic representation of final Model 2 (quit intention, identity and smoking behavior) with standardized coefficients (N = 768). All paths are significant at $p < .05$. For ease of presentation, covariances at wave 5 are not shown.

using a *p*-value of .20 as the cut-off value (Burkholder & Harlow, 2003). Third, to further increase parsimony, in Model 1 it was tested whether autoregressive and cross-lagged parameters could be restricted to be equal across waves (Meyers, Van Woerkom, De Reuver, Bakk, & Oberski, 2015). This was not applicable for Model 2 because autoregressive and cross-lagged paths were estimated between two waves. As before, χ^2-difference tests were used to examine whether restrictions could be applied without decreasing model fit. Models were fitted using unstandardized data. The figures show standardized regression coefficients, which may differ slightly despite being restricted to be equal across waves (see Appendices D and E for non-standardized regression coefficients). Finally, if model fit was still unsatisfactory, additional regression paths were included based on modification indices, until adequate model fit was obtained. Only predictions of variables by variables that were measured at an earlier wave were included (e.g., wave 6 predicted by wave 5). Importantly, adding parameters based on modification indices may decrease generalizability beyond the specific sample (e.g., Burkholder & Harlow, 2003). Generalizability was therefore estimated by cross validating both final models (i.e., Model 1 and 2), using data from waves 1-3.

To test RQ7, multiple-group analyses were performed on Models 1 and 2 to examine whether relations between identity, quit intention and quit success differed with SES. First, a model without any equality restrictions on model parameters between groups (i.e. configural invariance) was fitted, and regression coefficients were subsequently restricted to be equal between SES-groups. AIC values and χ^2-difference tests were used to compare the models. Non-significant χ^2-difference tests indicated that regression coefficients did not differ significantly between the groups.

RESULTS

Preliminary Analyses

Correlations between the variables that were used in the models were examined first (see Appendix F; see Table 1 for means and standard deviations). Almost all correlations were significant and in the expected direction. Smoker self- and group-identity correlated positively, and both smoker identity constructs correlated negatively with quitter self-identity. Furthermore, quit success -where higher scores indicate longer abstinence- correlated negatively with smoker identities and positively with quitter self-identity. Stronger quit intention was related to weaker smoker self- and group-identities, stronger quitter self-identities and more successful quitting.

Table 1. Means and standard deviations of variables used in Model 1 and 2.

	M (SD)					
	Model 1 (*N* = 1036)			**Model 2 (*N* = 768)**		
	Wave 4	*Wave 5*	*Wave 6*	*Wave 4*	*Wave 5*	*Wave 6*
Smoker self-identity	2.74 (1.08)	2.68 (1.10)	2.63 (1.15)	3.10 (.91)	3.09 (.93)	
Quitter self-identity	3.17 (1.13)	3.23 (1.15)	3.27 (1.20)	2.79 (.95)	2.80 (.96)	
Smoker group-identity	3.33 (.81)	3.33 (.83)	3.31 (.90)	3.46 (.77)	3.47 (.78)	
Quit success	1.99 (1.72)	2.20 (1.88)	2.86 (2.60)			1.55 (1.45)
Intention to quit				2.55 (1.11)	2.60 (1.15)	

Model 1 (RQ1, RQ2 and RQ7)

Model selection and specification.

Model C (i.e., only cross-lagged paths predicting identity from quit success) was selected as the best fitting model. Specifically, Model B (i.e., only cross-lagged paths predicting quit success from identity), Model C (i.e., only cross-lagged paths predicting identity from behaviour) and Model D (i.e., cross-lagged paths predicting identity from behaviour and vice versa) all had significantly better fit than model A (i.e., only autoregressions and covariances; see Table 2A). Model fit did not differ significantly between Models C and D ($p = .08$). Model C was selected as the best model because it was more parsimonious than Model D, and contained no non-significant regression coefficients. Next, the non-significant covariance between quitter self-identity and smoker group-identity at wave 5 was removed (-.02, $p = .33$). Further analyses showed that the autoregressive paths for smoker group-identity and the cross-lagged paths predicting smoker group-identity from quit success could be set equal across waves. That is, the strength of the relationships between these variables between waves 4 and 5 did not differ significantly from the strength of the associations between waves 5 and 6. Finally, regression paths were added based on modification indices to improve model fit.

Final model.

The final model had adequate fit and is shown in Figure 1 (see Table 2A for fit indices, and Appendix D for model parameters). Model χ^2 was significant, but this is common in large samples ($\chi^2(30) = 153.46$, $p < .001$). Average identity and quit success were relatively stable over time, as indicated by relatively strong autoregressive effects. In addition, the stability of smoker group-identity was equal across waves. Furthermore, quit success predicted identity, such that those who were lower at quit success (at wave 4 or 5) had increased smoker self-identities, decreased quitter self-identities and increased smoker group-identities one year later (at wave 5 or 6, respectively). Furthermore, stronger quitter self-identity at wave 5 predicted quit success at wave 6, but other

identity constructs did not predict quit success. Finally, quitter self-identity and smoker self-identity predicted each other. Specifically, stronger smoker self-identity (at wave 4) predicted decreased quitter self-identity one year later (at wave 5), and stronger quitter self-identity (at wave 5) predicted decreased smoker self-identity one year later (at wave 6).

Multiple-group analyses.

Multiple-group analyses showed that regression coefficients did not differ significantly between lower, middle and higher-SES groups (RQ7). Specifically, the χ^2-difference test was non-significant when the baseline multiple-group model without between-group equality restrictions was compared with the multiple-group model with regression coefficients set equal between SES-groups ($\chi^2(38) = 44.98$, $p = .20$).

Cross validation.

The final model was cross validated using data from 828 participants from waves 1-3. The cross validated model had satisfactory fit according to the CFI (.948) and SRMR (.073), but the RMSEA was slightly higher than considered acceptable (.083). Model χ^2 was significant, but this is common in large samples ($\chi^2(30) = 199.82$, $p < .001$). All paths of the final model, including the paths that were added based on the modification indices, were significant in the cross validated model.

Model 2 (RQ3-RQ7)

Model selection and specification.

Results for Model 2 showed that Model D (i.e., reciprocal cross-lagged paths from identity to quit intention) fitted the data significantly better than Model A, B and C (see Table 2B). Two non-significant cross-lagged regression paths (p-values > .20) were removed to make the model more parsimonious: quit intention (w5) regressed on smoker group-identity (w4; $\beta = .00$, $p = .99$), and quit intention (w5) regressed on smoker self-identity (w4; $\beta = -.05$, $p = .24$). In addition, three non-significant regression paths were removed from the prediction part, predicting quit success (w6) from quit intention (w5; $\beta = .03$, $p = .51$), smoker self-identity (w5; $\beta = .02$, $p = .74$) and smoker group-identity (w5; $\beta = -.01$, $p = .86$). Finally, the covariances between quitter self-identity (w5) and smoker group-identity (w5; .01, $p = .78$), and between quit intention (w5) and smoker group-identity (w5; -.02, $p = .36$) were removed. One regression path, predicting quitter self-identity (w5) from smoker self-identity (w4), was added to improve model fit.

Final model.

The final model had adequate fit (see Table 2B and Figure 2; see Appendix E for model parameters). Model χ^2 was again significant, but this is common in large samples ($\chi^2(15)$

Table 2A. Model 1: Fit of models for quit success and identity ($N = 1036$).

Model	Description	Fit Measures						χ^2-difference tests	
		df	χ^2	CFI	RMSEA	SRMR	AIC	Model comparison	χ^2 statistic
1A	Autoregressions and covariances	40	803.08	.845	.136	.194	33017.42		
1B	Cross-lagged paths: identity to behavior	34	757.72	.853	.143	.178	32998.68	1B vs. 1A	$\chi^2(6) = 30.63, p < .001$
1C	Cross-lagged paths: behavior to identity	34	574.75	.890	.124	.117	32767.92	1C vs. 1A	$\chi^2(6) = 234.90, p < .001$
1D	Bidirectional cross-lagged paths	28	547.57	.894	.134	.108	32768.48	1D vs. 1A	$\chi^2(12) = 257.71, p < .001$
								1D vs. 1C	$\chi^2(6) = 11.39, p = .08$
Final	Trimmed model 1C + additional paths	30	153.46	.975	.063	.060	32273.27	Final vs. 1C	$\chi^2(4) = 351.44, p < .001$

Table 2B. Model 2: Fit of models for intention to quit, identity and smoking behavior ($N = 768$).

Model	Description	Fit Measures						χ^2-difference tests	
		df	χ^2	CFI	RMSEA	SRMR	AIC	Model comparison	χ^2 statistic
1A	Autoregressions and covariances	16	156.35	.906	.107	.093	16663.79		
1B	Cross-lagged paths: identity to behavior	13	116.83	.930	.102	.068	16626.56	1B vs. 1A	$\chi^2(3) = 41.47, p < .001$
1C	Cross-lagged paths: behavior to identity	13	90.56	.948	.088	.051	16586.81	1C vs. 1A	$\chi^2(3) = 60.00, p < .001$
1D	Bidirectional cross-lagged paths	10	71.49	.959	.089	.040	16573.42	1D vs. 1A	$\chi^2(6) = 84.74, p < .001$
								1D vs. 1B	$\chi^2(3) = 43.05, p < .001$
								1D vs. 1C	$\chi^2(3) = 18.77, p < .001$
Final	Trimmed model 1D + additional path	15	50.72	.976	.056	.031	16534.87	Final vs. 1D	$\chi^2(5) = 28.83, p < .001$

= 50.72, $p < .001$). Results showed that identity constructs and quit intention were relatively stable between wave 4 and 5. Stronger quitter self-identity at wave 4 predicted increased quit intention at wave 5, and stronger quit intention at wave 4 predicted increased quitter self-identity, and decreased smoker self- and group-identity at wave 5. Stronger smoker self-identity at wave 4 predicted weaker quitter self-identity at wave 5. Furthermore, stronger quitter self-identity at wave 5 predicted quit success at wave 6. Analysis of indirect effects showed that stronger quit intention (w4) predicted more quit success (w6) through stronger quitter self-identity (w5), $\beta = .03$, $p < .01$. Moreover, quitter self-identity (w4) predicted quit success (w6) through quitter self-identity (w5), $\beta = .05$, $p < .01$. Finally, smoker self-identity (w4) predicted quit success (w6) through quitter self-identity, such that weaker smoker self-identity at wave 4 was associated with stronger quitter self-identity at wave 5, which in turn predicted quit success at wave 6, $\beta = -.02$, $p < .01$.

Multiple-group analyses.

Multiple-group analyses examined whether regression coefficients differed with SES (RQ7). The non-significant χ^2 difference test showed that the model without between-group restrictions did not differ significantly from the model with regression coefficients restricted to be equal ($\chi^2(20) = 24.053$, $p = .24$). This shows that regression coefficients did not differ significantly between SES-groups.

Cross validation.

The final model was cross validated using data from 681 participants from waves 1-3. The model deviated from the data, but this is common in large samples ($\chi^2(15) = 71.83$, $p < .001$). CFI (.961) and SRMR (.038) values indicated good fit, but the RMSEA value was slightly higher than considered acceptable (.075). Almost all significant regression coefficients remained significant in the cross validated model, except for smoker group-identity (w2) regressed on quit intention (w1). All indirect effects were significant.

DISCUSSION

This large-scale longitudinal study examined relations between identity, quit intention and quit success among smokers and ex-smokers, and tested whether these relations differ with socio-economic status (SES). Cross-lagged structural equation modelling was used as an advanced statistical technique, and cross validation was used to assess generalizability of the findings. Importantly, results held up very well in the cross validation sample, thereby replicating the findings and confirming generalizability beyond the sample.

The results provide new insights in the direction of relations between identity, quit intention and quit success, and show that quit success and intention consistently predict identity change. Specifically, quit success predicts changes in identity one year later, such that quit success is associated with decreased smoker self- and group-identity and increased quitter self-identity (Model 1). Moreover, stronger quit intention is associated with increased quitter self-identity and decreased smoker self-identity one year later (Model 2). These findings were replicated using the cross validation data. Stronger quit intention is also associated with decreased smoker group-identity one year later in the initial sample (Model 2), but not in the cross validation sample. In addition, quitter self-identity seems to be more important for quit intention and smoking behaviour than smoker identities. Specifically, cross-lagged paths show that stronger quitter self-identity predicts more quit success (Model 1) and increased quit intention (Model 2) beyond autoregressive effects (e.g., the effect of quit success at T-1 on quit success at T), while smoker identities do not. Furthermore, stronger quitter self-identity directly predicts quit success one year later, but smoker identities (and quit intention) do not (Model 2).

Results thus suggest that behaviour and identity are reciprocally related (Kearney & O'Sullivan, 2003; Stets & Burke 2003). Quit intention and quit success predict changes in all three identity constructs (i.e., quitter self-identity and smoker self- and group-identity), and quitter self-identity predicts changes in quit intention and quit success. This possibly suggests that behaviour is more important for changes in identity than the other way around. Correspondingly, previous work by Hertel and Mermelstein (2016) and Shadel and colleagues (1996) showed that behaviour is related to subsequent smoking identities. If this finding will be replicated in future work on smoking and (health) behaviour more broadly, this has theoretical implications. That is, the impact of behaviour on identity may then be explicitly incorporated in theories about identity that focus on the importance of identity for behaviour, such as the social identity approach (Turner et al., 1987) and PRIME Theory (West, 2006) . However, the simultaneous inclusion of the three identity constructs in the current analyses might have decreased the ability of each individual identity construct to predict intention and behaviour, whereas this was not the case for reversed relationships (i.e., intention/behaviour as predictor of each identity construct).

Importantly, results suggest that quitter self-identity is more relevant for quitting than smoker identities. This is in line with previous work among smokers suggesting that identification the 'possible self' (see Markus & Nurius, 1986) as a quitter or non-smoker is more important for quitting than the 'current self' as a smoker (Meijer et al., 2015, 2016). However, it appears to contradict other previous work among smokers that showed that smoker identity is related to intention and subsequent behaviour (e.g., Hertel & Mermelstein, 2012; Høie et al., 2010; Moan & Rise, 2005, 2006; Tombor et al., 2013; Van

den Putte et al., 2009). An explanation is that most previous studies showing effects of smoker identity did not take quitter identity into account, such that smoker identity might not have been predictive if quitter identity had been controlled for. One study that included both smoker and quitter self-identity showed that smoker self-identity predicted quit attempts, whereas quitter self-identity predicted quit attempts and quit intention (Van den Putte et al., 2009).

The current results provide interesting ground for future work. Notably, the current study included both smokers and ex-smokers, and whereas the identity as a quitter is a possible self for smokers, ex-smokers are more likely to hold a quitter identity as a current self. Conversely, the identity as a smoker is a current self for smokers whereas it is more likely to be a past or (undesired) possible self for ex-smokers, although ex-smokers may still identify with smoking (Vangeli, Stapleton, & West, 2010). Work on possible selves has shown that possible selves provide a strong guide for current behaviour, such that people are motivated to behave in ways that help to avoid undesired possible selves and achieve desired possible selves (e.g., Barreto & Frazier, 2012; Markus & Nurius, 1986). In addition, people are motivated to hold a positive current identity and to behave in line with important aspects of how they perceive themselves in the present (e.g., West, 2006). Possible selves and current selves affect behaviour in different ways, and smoker and quitter identities therefore are likely to play different roles for smokers and ex-smokers. Similarly, whereas smokers are likely to perceive other smokers as in-group members, ex-smokers are more likely to categorize smokers as part of an out-group. As with self-identity, people are motivated to maintain a positively valued group identity (Tajfel & Turner, 1979, 1986), and respond differently to social groups depending on whether they perceive themselves as part of these groups or not (e.g., Wenzel, Mummendey, & Walzus, 2007). Future research is needed to further examine the roles of possible and current selves as well as in-group and out-group identities in smokers and ex-smokers.

The finding that quit intention does not directly predict quit success (when identity constructs were controlled for) is interesting to examine in future research. Importantly, previous work has shown that whereas quit intention predicts quit attempts, other factors such as self-efficacy and nicotine dependence are more relevant for successful maintenance of quitting (e.g., Smit et al., 2014; Vangeli et al., 2011). This may potentially explain the finding in the current research, as the measure of quit success more strongly resembles maintenance than initiation of quitting. In that case, identity seems more relevant than quit intentions for continued quitting. Moreover, the results show that quit intention indirectly relates to quit success through quitter self-identity. However, a meta-analysis on self-identity (in relation to various health behaviours) and the theory of planned behaviour suggested a contrary mediational effect with quit intention mediating the relation between identity and behaviour (Rise, Sheeran, & Hukkelberg, 2010). As quit intention did not directly predict quit success in our model, mediation of the

relation between quitter self-identity and quit success through quit intention was not examined. Unexpectedly, the relations between identity, intention and behaviour did not differ with SES. This contrasts one study that showed moderation of the relation between non-smoker self-identity and quit intention by SES (Meijer et al., 2015). However, this previous study did not find moderation for quit attempts, and another study did not find moderation effects of SES on the association between identity and intention (Meijer et al., 2016).

The current study has limitations. First, although the longitudinal design allowed for examination of relations between identity, quit intention and quit success across many years, the one-year between waves prevented analyses of subtle changes, which are likely to occur as part of quitting (e.g., Hughes, Keely, Fagerstrom, & Callas, 2005). Future research may use weekly or daily measurements to capture these finer-grained changes, for example by mobile phones (Scholz et al., 2016). Second, several identity constructs were included and compared, but the number of items to measure each was small. Unfortunately, comprehensive measurement of many constructs is impossible in large-scale longitudinal studies on representative samples. Relatedly, ourmeasure of group-identity represented ties with smokers, but it may be useful to also include other aspects of group-identification, such as ingroup affect or centrality (Cameron, 2004; Høie et al., 2010; Meijer et al., 2016). In addition, the ITC Netherlands Surveys did not measure quitter group-identity, or other identity aspects (e.g., non-smoker identities) that previous research showed are important (Meijer et al., 2015; 2016). More comprehensive measurement and the inclusion of other identity constructs may show different results, although the importance of identification with quitting is in line with findings from studies that used comprehensive identity measurements (Meijer et al., 2015, 2016). Third, the samples used for the initial analysis and cross validation might not have been fully representative due to (selective) attrition. However, the samples at individual waves were very representative of the Dutch smokers population (Nagelhout et al., 2010; 2016). Furthermore, Model 2 included only continuing smokers at waves 4 and 5, because quit intention was not measured among ex-smokers, possibly reducing variance in quit intention. Fourth, 400 (39%) and 255 (33%) of the participants included in the initial samples for Model 1 and 2 were also included in the cross-validation samples, such that, in part, the same participants were modeled. However, measurements were taken three years apart and the majority of participants in the cross-validation samples were not included in the initial samples. Importantly, a model that includes waves 1 to 6 would have led to loss of many participants. Finally, other analyses were of course possible (e.g., latent growth curve modelling, using change scores), but these would not have answered the current research questions. Latent growth curve modelling has been used elsewhere to examine identity change processes (Meijer et al., 2017).

The results have important implications. The finding that behaviour may be more important for identity than vice versa, if replicated, may call for additions to identity theories. Moreover, changing smoking behavior may be a vehicle to change smoking-related identity, for example through smoking cessation counseling. Furthermore, quitter self-identity appeared more important for quit intentions and smoking behaviour than smoker identities. Future research should therefore investigate ways to strengthen identification with quitting among smokers and ex-smokers, for example through narratives (McAdams & McLean, 2013; Meijer, Gebhardt, Van Laar, Van den Putte, & Evers, 2017; Parry, Fowkes, & Thomson, 2001; Pennebaker, 2004, 2010) or avatars (Song, Kim, Kwon, & Jung, 2013). Narratives and avatars have successfully been used to strengthen identity in the past. The development of such identity-focused interventions is likely to help more smokers and ex-smokers to move toward quitting smoking and to remain abstinent.

In sum, this study provided important new insights into the longitudinal relationships between identity and smoking cessation, using a large sample of smokers and ex-smokers. Intention and behaviour appear to be more important for identity change than the other way around, but identity remains important in relation to intention and behaviour. Moreover, strengthening identification with quitting among smokers and ex-smokers seems more important for smoking cessation than decreasing identification with smoking or smokers.

REFERENCES

Barreto, M. L., & Frazier, L. D. (2012). Coping with life events through possible selves. *Journal of Applied Social Psychology, 42*, 1785–1810. DOI:10.1111/j.1559-1816.2012.00918.x.

Bem, D. J. (1972). Self-perception theory. *Advances in Experimental Social Psychology*, *6*, 1-62. DOI: 10.1016/S0065-2601(08)60024-6.

Best, D., Beckwith, M., Haslam, C., Alexander Haslam, S. A., Jetten, J., Mawson, E., & Lubman, D. I. (2015). Overcoming alcohol and other drug addiction as a process of social identity transition: The Social Identity Model of Recovery (SIMOR). *Addiction Research & Theory*, 1-13. DOI:10.3109/16066359.2015.1075980.

Brown, J. M. (1996). Redefining smoking and the self as a non-smoker. *Western Journal of Nursing Research*, *18*(4), 414-428. DOI:10.1177/019394599601800404.

Burkholder, G. J., & Harlow, L. L. (2003). An illustration of a longitudinal cross-lagged design for larger structural equation models. *Structural Equation Modeling*, *10*(3), 465-486. DOI:10.1207/S15328007SEM1003_8.

Cameron, J. E. (2004). A three factor model of social identity. *Self and Identity, 3*, 239–262. DOI:10.1080/13576500444000047.

Fong, G. T., Cummings, K. M., Borland, R., Hastings, G., Hyland, A., Giovino, G. A., ... & Thompson, M. E. (2006). The conceptual framework of the International Tobacco Control (ITC) policy evaluation project. *Tobacco Control*, *15*(suppl 3), iii3-iii11.

Frings, D., & Albery, I. P. (2015). The Social Identity Model of Cessation Maintenance: Formulation and initial evidence. *Addictive Behaviours*, *44*, 35-42. DOI:10.1016/j.addbeh.2014.10.023.

Hertel, A. W., & Mermelstein, R. J. (2012). Smoker identity and smoking escalation among adolescents. *Health Psychology*, *31*(4), 467-475. DOI:10.1037/a0028923.

Hertel, A. W., & Mermelstein, R. J. (2016). Smoker identity development among adolescents who smoke. *Psychology of Addictive Behaviours*. Advance online publication. DOI:10.1037/adb0000171.

Høie, M., Moan, I. S., & Rise, J. (2010). An extended version of the theory of planned behaviour: Prediction of intentions to quit smoking using past behaviour as moderator. *Addiction Research and Theory, 18*(5), 572-585. DOI:10.3109/16066350903474386.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1-55. DOI:10.1080/10705519909540118.

Hughes, J. R., Keely, J. P., Fagerstrom, K. O., & Callas, P. W. (2005). Intentions to quit smoking change over short periods of time. *Addictive Behaviours*, *30*(4), 653-662. DOI:10.1016/j.addbeh.2004.08.011.

Kearney, M. H. & O'Sullivan, J. (2003). Identity shifts as turning points in health behaviour change. *Western Journal of Nursing Research, 25*(2), 134-152. DOI:10.1177/0193945902250032.

Luck, K., & Beagan, B. (2014). Occupational transition of smoking cessation in women: "You're restructuring your whole life". *Journal of Occupational Science, 22*(2), 183-196. DOI:10.1080/14427591.2014.887418.

Markus, H. & Nurius, P. (1986). Possible selves. *American Psychologist, 41*,954-969. DOI:10.1037/0003-066X.41.9.954.

Martens, M. P., & Haase, R. F. (2006). Advanced applications of structural equation modeling in counseling psychology research. *The Counseling Psychologist*, *34*(6), 878-911. DOI:10.1177/0011000005283395.

McAdams, D. P., & McLean, K. C. (2013). Narrative identity. *Current Directions in Psychological Science, 22*(3), 233-238. DOI:10.1177/0963721413475622.

Meijer E., Gebhardt W. A., Dijkstra A., Willemsen M. C. & Van Laar C. (2015). Quitting smoking: The importance of non-smoker identity in predicting smoking behaviour and responses to a smoking ban, *Psychology & Health* 30(12): 1387-1409. DOI:10.1080/08870446.2015.1049603.

Meijer, E. Gebhardt, W. A., Van Laar, C., Kawous, R., & Beijk, S. C. A. M. (2016). Socio-economic status in relation to smoking: The role of (expected and desired) social support and quitter identity. *Social Science & Medicine, 162,* 41-49. DOI:10.1016/j.socscimed.2016.06.022.

Meijer, E., Gebhardt, W. A., Van Laar, C., Van den Putte, B., & Evers, A. W. M. (2017). Strengthening quitter self-identity: An experimental study. Manuscript submitted for publication.

Meijer, E., Van Laar, C., Gebhardt, W. A., Fokkema, M., Van den Putte, B., Dijkstra, A., … & Willemsen, M. C. (2017). Identity change among smokers and ex-smokers: Findings from the ITC Netherlands Survey. *Psychology of Addictive Behaviors.* Online first. DOI: 10.1037/adb0000281

Meyers, M. C., van Woerkom, M., de Reuver, R. S., Bakk, Z., & Oberski, D. L. (2015). Enhancing psychological capital and personal growth initiative: working on strengths or deficiencies. *Journal of Counseling Psychology*, *62*(1), 50-62. DOI:10.1037/cou0000050.

Moan, I. S. & Rise, J. (2005). Quitting smoking: Applying an extended version of the theory of planned behaviour to predict intention and behaviour. *Journal of Applied Biobehavioural Research, 10*(1), 39-68. DOI:10.1111/j.1751-9861.2005.tb00003.x.

Moan, I. S. & Rise, J. (2006). Predicting smoking reduction among adolescents using an extended version of the theory of planned behaviour. *Psychology and Health, 21*(6), 717-738. DOI:10.1080/14768320600603448.

Nagelhout, G. E., Heijndijk, S. M., Cummings, K. M., Willemsen, M. C., Van den Putte, B., Heckman, B. W., … & Borland, R. (2016). E-cigarette advertisements, and associations with the use of e-cigarettes and disapproval or quitting of smoking: Findings from the International Tobacco Control (ITC) Netherlands Survey. *International Journal of Drug Policy, 29,* 73-79.

Nagelhout, G. E., Willemsen, M. C., Thompson, M. E., Fong, G. T., Van den Putte, B., & De Vries, H. (2010). Is web interviewing a good alternative to telephone interviewing? Findings from the International Tobacco Control (ITC) Netherlands Survey. *BMC Public Health*, *10*(1), 1-10. DOI:10.1186/1471-2458-10-351.

Parry, O., Fowkes, F. G. R. & Thomson, C. (2001). Accounts of quitting among older ex-smokers with smoking-related disease. *Journal of Health Psychology, 6,* 481-493. DOI:10.1177/135910530100600502.

Pennebaker, J. W. (2004). Theories, therapies, and taxpayers: On the complexities of the expressive writing paradigm. *Clinical Psychology: Science and Practice, 11*, 138-142. DOI:10.1093/clipsy.bph063.

Pennebaker, J. W. (2010). Expressive writing in a clinical setting. *The Independent Practitioner, 30*, 23-25.

R Core Team (2014). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL http://www.R-project.org/.

Rise, J., Sheeran, P., & Hukkelberg, S. (2010). The role of self-identity in the Theory of Planned Behaviour: A meta-analysis. *Journal of Applied Social Psychology, 40*(5), 1085-1105. DOI:10.1111/j.1559-1816.2010.00611.x.

Rosseel, Y. (2012). lavaan: An R Package for Structural Equation Modeling. *Journal of Statistical Software, 48*(2), 1-36.

Schaap, M. M., & Kunst, A. E., (2009). Monitoring of socio-economic inequalities in smoking: Learning from the experiences of recent scientific studies. *Public Health, 123,* 103-109. DOI:10.1016/j.puhe.2008.10.015.

Scholz, U., Stadler, G., Ochsner, S., Rackow, P., Hornung, R., & Knoll, N. (2016). Examining the relationship between daily changes in support and smoking around a self-set quit date. *Health Psychology*, *35*(5), 514-517. DOI:10.1037/hea0000286.

Shadel, W. G., Mermelstein, R., & Borrelli, B. (1996). Self-concept changes over time in cognitive-behavioural treatment for smoking cessation. *Addictive Behaviours, 21*(5), 659-663. DOI:10.1016/0306-4603(95)00088-7.

Smit, E. S., Hoving, C., Schelleman-Offermans, K., West, R., & de Vries, H. (2014). Predictors of successful and unsuccessful quit attempts among smokers motivated to quit. *Addictive Behaviours*, *39*(9), 1318-1324. DOI:10.1016/j.addbeh.2014.04.017.

Song, H., Kim, J., Kwon, R. J., & Jung, Y. (2013). Anti-smoking educational game using avatars as visualized possible selves. *Computers in Human Behaviour*, *29*(5), 2029-2036. DOI:10.1016/j.chb.2013.04.008.

Stets, J. E., & Burke, P. J. (2003). A sociological approach to self and identity. In M. R. Leary & J. P. Tangney (Eds.), *Handbook of self and identity* (pp. 128–152). New York: Guilford.

Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33–47). Monterey, CA: Brooks/Cole Publishing Company.

Tajfel, H., & Turner, J. C. (1986). The social identity theory of intergroup behaviour. In Worchel, S. & Austin, W. G. (Eds.), *The psychology of intergroup relations* (pp. 7–24). Chicago: Nelson-Hall.

Tombor, I., Shahab, L., Brown, J., & West, R. (2013). Positive smoker identity as a barrier to quitting smoking: Findings from a national survey of smokers in England. *Drug and Alcohol Dependence, 133*, 740-745. DOI:10.1016/j.drugalcdep.2013.09.001.

Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). Rediscovering the social group: A self-categorization Theory. Oxford: Basil Blackwell.

Van den Putte, B., Yzer, M., Willemsen, M. C., & De Bruijn, G. (2009). The effects of smoking self-identity and quitting self-identity on attempts to quit smoking. *Health Psychology, 28*(5), 535-544. DOI:10.1037/a0015199.

Vangeli, E., Stapleton, J., Smit, E. S., Borland, R., & West, R. (2011). Predictors of attempts to stop smoking and their success in adult general population samples: a systematic review. *Addiction*, *106*(12), 2110-2121. DOI:10.1111/j.1360-0443.2011.03565.x.

Vangeli, E., Stapleton, J., & West, R. (2010). Residual attraction to smoking and smoker identity following smoking cessation. *Nicotine & Tobacco Research*, *12*(8), 865-869. DOI: 10.1093/ntr/ntq104.

Vangeli, E., & West, R. (2012). Transition towards a 'non-smoker' identity following smoking cessation: An interpretative phenomenological analysis. *British Journal of Health Psychology, 17,* 171-184. DOI:10.1111/j.2044-8287.2011.02031.x.

Wenzel, M., Mummendey, A., & Waldzus, S. (2007). Superordinate identities and intergroup conflict: The ingroup projection model. *European Review of Social Psychology*, *18*(1), 331-372. DOI:10.1080/10463280701728302.

West, R. (2006). *Theory of addiction*. Oxford: Blackwell, Addiction Press.

APPENDIX A. DIFFERENCES BETWEEN 'DROP-OUTS' AND 'RESPONDERS' IN BACKGROUND VARIABLES (MAIN SAMPLE): CHI-SQUARE TEST AND ONE-WAY ANOVAS.

		Drop-outs (n=497-633)	*Responders (n=1070-1389)*	
Characteristic		***Frequency (Expected count)***		***χ^2 statistic***
Gender[a]	Female	285 (307)	694 (673)	$\chi^2(1) = 4.25$, $p = .04$
	Male	348 (327)	695 (717)	
SES	Low	184 (181)	395 (398)	$\chi^2(2) = .38$, $p = .83$
	Middle	286 (283)	617 (620)	
	High	158 (163)	362 (356)	
Smoking status	Smoker	510 (502)	1094 (1102)	$\chi^2(1) = .87$, $p = .35$
	Ex-smoker	123 (131)	295 (287)	
		M (SD)		***t statistic***
Age		38.80 (15.14)	43.67 (16.14)	t(1298.27) = -6.57, p < .001, d = .31
Smoker self-identity		2.83 (1.04)	2.73 (1.06)	$t(1897) = 1.93$, $p = .054$, $d = .10$
Quitter self-identity		3.14 (1.12)	3.17 (1.12)	$t(1853) = -.53$, $p = .60$, $d = .03$
Smoker group-identity		3.35 (.79)	3.31 (.81)	$t(1927) = .94$, $p = .35$, $d = .05$
Quit intention		2.61 (1.19)	2.61 (1.12)	$t(1565) = -.06$, $p = .96$, $d = .00$
Cigarettes per day		11.29 (9.48)	11.26 (9.40)	$t(1984) = .07$, $p = .95$, $d = .00$
Quit success		1.87 (1.62)	1.92 (1.69)	$t(2020) = -.62$, $p = .54$, $d = .03$

Note. 'Responders' were defined as those who completed waves 4-6, and 'drop-outs' were those who completed wave 4 but did not complete wave 5 and/or 6.

APPENDIX B. CHARACTERISTICS OF PARTICIPANTS INCLUDED IN MODEL 1 (N = 1036) AND MODEL 2 (N = 768).

		Frequency (%)					
		Model 1			**Model 2**		
Characteristic		*Wave 4*	*Wave 5*	*Wave 6*	*Wave 4*	*Wave 5*	*Wave 6*
Gender	Female	517 (50%)			375 (49%)		
	Male	519 (50%)			393 (51%)		
SES	Low	269 (26%)			229 (30%)		
	Middle	463 (46%)			370 (48%)		
	High	291 (28%)			168 (22%)		
Smoking status	Smoker	795 (77%)	753 (73%)	712 (69%)	728 (100%)	728 (100%)	693 (90%)
	Ex-smoker	241 (23%)	283 (27%)	324 (31%)	0 (0%)	0 (0%)	75 (10%)
		M (SD)					
		Model 1			**Model 2**		
		Wave 4	*Wave 5*	*Wave 6*	*Wave 4*	*Wave 5*	*Wave 6*
Age							
Smoker self-identity		2.74 (1.08)	2.68 (1.10)	2.63 (1.15)	3.10 (.91)	3.09 (.93)	3.07 (.98)
Quitter self-identity		3.17 (1.13)	3.23 (1.15)	3.27 (1.20)	2.79 (.95)	2.80 (.96)	2.84 (1.04)
Smoker group-identity		3.33 (.81)	3.33 (.83)	3.31 (.90)	3.45 (.77)	3.47 (.78)	3.49 (.83)
Quit intention[a]		2.62 (1.15)	2.65 (1.19)	2.54 (1.16)	2.55 (1.11)	2.60 (1.15)	2.46 (1.11)
Cigarettes per day[a]		11.10 (9.53)	10.38 (10.01)	9.55 (9.57)	14.75 (8.18)	14.66 (8.52)	13.05 (8.83)
Quit success		1.99 (1.72)	2.20 (1.88)	2.86 (2.60)	1.09 (.36)	1.10 (.38)	1.55 (1.45)

Note. a = only measured among smokers.

Of the participants included in Model 1 636 (61%) were smokers at all waves; 180 (17%) were ex-smokers at all waves; 69 (7%) were smokers at waves 4 and 5 and ex-smokers at wave 6; 58 (6%) were smokers at wave 4 and ex-smokers at waves 5 and 6; 32 (3%) were smokers at wave 4, ex-smokers at wave 5 and smokers at wave 6; 31 (3%) were ex-smokers at wave 4 and smokers at waves 5 and 6; 17 (2%) were ex-smokers at wave 4, smokers at wave 5 and ex-smokers at wave 6; and 13 (1%) were ex-smokers at waves 4 and 5 and smokers at wave 6.

APPENDIX C. DIFFERENCES BETWEEN 'DROP-OUTS' AND 'RESPONDERS' IN BACKGROUND VARIABLES (CROSS VALIDATION SAMPLE): CHI-SQUARE TEST AND ONE-WAY ANOVAS.

		Drop-outs (n=523-908)	*Responders (n=964-1104)*	
Characteristic		***Frequency (Expected count)***		***χ^2 statistic***
Gender[a]	Female	389 (425)	553 (517)	$\chi^2(1) = 10.52$, $p < .001$
	Male	519 (483)	551 (587)	
SES	Low	240 (286)***	395 (349)***	$\chi^2(1) = 20.66$, $p < .001$
	Middle	407 (384)**	444 (467)**	
	High	247 (224)**	249 (272)**	
Smoking status	Smoker	785 (796)	978 (967)	$\chi^2(1) = 2.09$, $p = .15$
	Ex-smoker	123 (112)	126 (137)	
		M (SD)		***t statistic***
Age		38.18 (15.91)	39.15 (15.30)	$t(2010) = -1.40$, $p = .16$, $d = .06$
Smoker self-identity		2.97 (.94)	2.99 (.98)	$t(1632) = -.56$, $p = .58$, $d = .02$
Quitter self-identity		3.01 (.99)	2.94 (1.05)	$t(1573) = 1.41$, $p = .16$, $d = .07$
Smoker group-identity		3.43 (.75)	3.45 (.78)	$t(1662) = -.39$, $p = .70$, $d = .03$
Quit intention		2.66 (1.13)	2.63 (1.28)	$t(1489) = .55$, $p = .58$, $d = .02$
Cigarettes per day		14.00 (8.09)	14.97 (8.24)	$t(1736) = -2.45$, $p = .01$, $d = .12$
Quit success		1.64 (1.45)	1.58 (1.41)	$t(2010) = .93$, $p = .35$, $d = .04$

* $p < .05$; ** $p < .01$; *** $p < .001$ (deviations from expected cell counts).

Note. 'Responders' were defined as those who completed waves 1-3, and 'drop-outs' were those who completed wave 1 but did not complete wave 2 and/or 3.

a. Although χ^2 was significant, no significant differences were found between counts and expected counts.

APPENDIX D. MODEL 1: PATHS IN THE FINAL MODEL FOR QUIT SUCCESS AND IDENTITY (N = 1036).

	b(SE)	*β*
Autoregressive paths		
Initial paths		
Smoker self-identity (w4) ➜ Smoker self-identity (w5)	.55 (.03)***	.55***
Smoker self-identity (w5) ➜ Smoker self-identity (w6)	.33 (.04)***	.31***
Quitter self-identity (w4) ➜ Quitter self-identity (w5)	.32 (.03)***	.32***
Quitter self-identity (w5) ➜ Quitter self-identity (w6)	.45 (.04)***	.43***
Smoker group-identity (w4) ➜ Smoker group-identity (w5)[a]	.44 (.02)***	.45***
Smoker group-identity (w5) ➜ Smoker group-identity (w6)[a]	.44 (.02)***	.40***
Quit success (w4) ➜ Quit success (w5)	.66 (.03)***	.61***
Quit success (w5) ➜ Quit success (w6)	.67 (.05)***	.48***
Additional paths		
Smoker self-identity (w4) ➜ Smoker self-identity (w6)	.12 (.03)***	.12***
Smoker group-identity (w4) ➜ Smoker group-identity (w6)	.30 (.03)***	.28***
Quit success (w4) ➜ Quit success (w6)	.38 (.05)***	.25***
Cross-lagged paths		
Initial paths		
Quit success (w4) ➜ Smoker self-identity (w5)	-.09 (.02)***	-.15***
Quit success (w4) ➜ Quitter self-identity (w5)	.09 (.02)***	.14***
Quit success (w4) ➜ Smoker group-identity (w5)[b]	-.06 (.01)***	-.13***
Quit success (w5) ➜ Smoker self-identity (w6)	-.10 (.02)***	-.16***
Quit success (w5) ➜ Quitter self-identity (w6)	.09 (.02)***	.15***
Quit success (w5) ➜ Smoker group-identity (w6)[b]	-.06 (.01)***	-.13***
Additional paths		
Quitter self-identity (w5) ➜ Quit success (w6)	.32 (.06)***	.14***
Smoker self-identity (w4) ➜ Quitter self-identity (w5)	-.30 (.04)***	-.28***
Smoker self-identity (w5) ➜ Quitter self-identity (w6)	-.23 (.04)***	-.21***
Quitter self-identity (w5) ➜ Smoker self-identity (w6)	-.26 (.04)***	-.26***

*** $p < .001$.

Note. Paths with the same superscript were restricted to be equal across waves.

APPENDIX E. MODEL 2: PATHS IN THE FINAL MODEL FOR QUIT INTENTION, IDENTITY AND QUIT SUCCESS (N = 768).

	b(SE)	*β*
Autoregressive paths		
Smoker self-identity (w4) ➔ Smoker self-identity (w5)	.53 (.04)***	.53***
Quitter self-identity (w4) ➔ Quitter self-identity (w5)	.34 (.05)***	.34***
Smoker group-identity (w4) ➔ Smoker group-identity (w5)	.52 (.03)***	.52***
Quit intention (w4) ➔ Quit intention (w5)	.49 (.04)***	.47***
Cross-lagged paths		
Initial paths		
Quitter self-identity (w4) ➔ Quit intention (w5)	.21 (.05)***	.17***
Quit intention (w4) ➔ Smoker self-identity (w5)	-.13 (.03)***	-.15***
Quit intention (w4) ➔ Quitter self-identity (w5)	.18 (.04)***	.21***
Quit intention (w4) ➔ Smoker group-identity (w5)	-.04 (.02)$^{+}$	-.06^{+}
Additional paths		
Smoker self-identity (w4) ➔ Quitter self-identity (w5)	-.19 (.04)***	-.18***
Regressions on quit success		
Quitter self-identity (w5) ➔ Quit success (w6)	.20 (.06)***	.13***
Indirect effects		
Quitter self-identity (w4) ➔ Quitter self-identity (w5) ➔ Quit success (w6)	.07 (.02)**	.05**
Quit intention (w4) ➔ Quitter self-identity (w5) ➔ Quit success (w6)	.04 (.01)**	.03**
Smoker self-identity (w4) ➔ Quitter self-identity (w5) ➔ Quit success (w6)	-.04 (.01)**	-.02**

$^{+}$ $p < .10$; ** $p < .01$; *** $p < .001$.

APPENDIX F. CORRELATIONS BETWEEN VARIABLES USED IN MODEL 1 (N = 1036).

	1	2	3	4	5	6	7	8	9	10	11
1. Smoker self-identity (w4)	1										
2. Smoker self-identity (w5)	.66**	1									
3. Smoker self-identity (w6)	.60**	.68**	1								
4. Quitter self-identity (w4)	-.75**	-.59**	-.57**	1							
5. Quitter self-identity (w5)	-.61**	-.71**	-.65**	.65**	1						
6. Quitter self-identity (w6)	-.53**	-.61**	-.81**	.57**	.67**	1					
7. Smoker group-identity (w4)	.44**	.35**	.33**	-.29**	-.24**	-.23**	1				
8. Smoker group-identity (w5)	.33**	.45**	.35**	-.25**	-.22**	-.27**	.54**	1			
9. Smoker group-identity (w6)	.36**	.37**	.46**	-.31**	-.27**	-.30**	.55**	.57**	1		
10. Quit success (w4)[a]	-.53**	-.43**	-.47**	.53**	.46**	.42**	-.28**	-.25**	-.28**	1	
11. Quit success (w5)[a]	-.44**	-.54**	-.54**	.45**	.57**	.51**	-.24**	-.25**	-.28**	.67**	1
12. Quit success (w6)[a]	-.45**	-.50**	-.65**	.44**	.52**	.60**	-.25**	-.23**	-.31**	.66**	.76**

** $p < .01$

a. Spearman correlations instead of Pearson correlations.

APPENDIX F (CONT.). CORRELATIONS BETWEEN VARIABLES USED IN MODEL 2 (N = 768).

	1	2	3	4	5	6	7	8	9
1. Smoker self-identity (w4)	1								
2. Smoker self-identity (w5)	.64**	1							
3. Quitter self-identity (w4)	-.64**	-.51**	1						
4. Quitter self-identity (w5)	-.55**	-.60**	.62**	1					
5. Smoker group-identity (w4)	.37**	.29**	-.18**	-.14**	1				
6. Smoker group-identity (w5)	.28**	.37**	-.15**	-.10**	.55**	1			
7. Quit intention (w4)	-.55**	-.43**	.68**	.54**	-.15**	-.14**	1		
8. Quit intention (w5)	-.46**	-.51**	.51**	.67**	-.14**	-.13**	.58**	1	
10. Quit success (w6)[a]	-.10**	-.12**	0.07	.14**	-.10**	-0.05	.08*	.12**	-.62**

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

a. Spearman correlations instead of Pearson correlations.

CHAPTER 7

IDENTITY CHANGE AMONG SMOKERS AND EX-SMOKERS: FINDINGS FROM THE ITC NETHERLANDS SURVEY

Eline Meijer, Colette van Laar, Winifred A. Gebhardt, Marjolein Fokkema, Bas van den Putte, Arie Dijkstra, Geoffrey T. Fong, and Marc C. Willemsen

This chapter was published in *Psychology of Addictive Behaviors*.
Meijer, E., Van Laar, C., Gebhardt, W. A., Fokkema, M., Van den Putte, B., Dijkstra, A., … & Willemsen, M. C. (2017). Identity change among smokers and ex-smokers: Findings from the ITC Netherlands Survey. *Psychology of Addictive Behaviors.* Online first. DOI: 10.1037/adb0000281

ABSTRACT

Successful smoking cessation appears to be facilitated by identity change, i.e., when quitting or nonsmoking becomes part of smokers' and ex-smokers' self-concepts. The current longitudinal study is the first to examine how identity changes over time among smokers and ex-smokers, and whether this can be predicted by socio-economic status (SES) and psychosocial factors (i.e., attitude, perceived health damage, social norms, stigma, acceptance, self-evaluative emotions, health worries, expected social support). We examined identification with smoking (i.e., smoker self-identity) and quitting (i.e., quitter self-identity) among a large sample of smokers (n = 742) and ex-smokers (n = 201) in a cohort study with yearly measurements between 2009 and 2014. Latent growth curve modeling was used as an advanced statistical technique. As hypothesized, smokers perceived themselves more as smokers and less as quitters than did ex-smokers, and identification with smoking increased over time among smokers and decreased among ex-smokers. Furthermore, psychosocial factors predicted baseline identity and identity development. Socio-economic status (SES) was particularly important. Specifically, lower SES smokers and lower SES ex-smokers identified more strongly with smoking, and smoker and quitter identities were more resistant to change among lower SES groups. Moreover, stronger pro-quitting social norms were associated with increasing quitter identities over time among smokers and ex-smokers, and with decreasing smoker identities among ex-smokers. Predictors of identity differed between smokers and ex-smokers. Results suggest that SES and pro-quitting social norms should be taken into account when developing ways to facilitate identity change and, thereby, successful smoking cessation.

Keywords: identity change; socio-economic status; psychosocial factors; smokers; ex-smokers.

Identity is important for smoking behavior (e.g., Lindgren, Neighbors, Gasser, Ramirez, & Cvencek, 2016). Previous work suggests that identity change facilitates successful quitting (Tombor, Shabab, Brown, Notley, & West, 2015), but it is less clear *how* smokers and ex-smokers come to see themselves more as a quitter or nonsmoker, and less as a smoker. The current study is the first to examine whether socio-economic status (SES) and psychosocial factors are associated with changes in identification with smoking (i.e., smoker self-identity) and quitting (i.e., quitter self-identity) among smokers and ex-smokers.

PRIME theory states that people are more likely to engage in behavior that they perceive as fitting with who they are (West, 2006). In addition, the social identity approach states that people may derive their identity from their memberships in social groups (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). People are likely to behave in line with the social norms of the groups that they strongly identify with (Tajfel & Turner, 1979, 1986). Previous work showed that identity is related to smoking behavior, even when controlling for other important influences. Specifically, controlling for other important factors, smokers who identify with quitting, nonsmoking, or the group of nonsmokers are more likely to quit smoking successfully, whereas smokers who identify with smoking or the group of smokers are less likely to quit successfully (e.g., Hertel & Mermelstein, 2012; Høie, Moan, & Rise, 2010; Meijer, Gebhardt, Kawous, Beijk, & Van Laar, 2016; Meijer, Gebhardt, Van Laar, Dijkstra, & Willemsen, 2015; Meijer et al., 2017; Moan & Rise, 2005, 2006; Tombor, Shabab, Brown, & West, 2013; Van den Putte, Yzer, Willemsen, & De Bruijn, 2009). Also, when effects are directly compared, quitter and nonsmoker identities are more important for smoking cessation than are smoker identities (Meijer et al., 2015, 2016, 2017). As such, for smokers, possible selves as quitters appear more important for quitting than current selves as smokers. Furthermore, some evidence suggests that smokers from lower socio-economic status backgrounds may have more difficulty picturing themselves as nonsmokers (Meijer et al., 2015), although this has not yet been replicated (Meijer et al., 2016, 2017).

Identity is not only relevant in the period before a quit attempt, but continues to change after successful smoking cessation, such that ex-smokers come to perceive themselves more as nonsmokers and move away from their previous identity as smokers (Brown, 1996; Luck & Beagan, 2015; Shadel, Mermelstein, & Borrelli, 1996; Vangeli & West, 2012). Stronger identification with non-smoking is associated with continued abstinence (Tombor et al., 2015). On the other hand, ex-smokers may also retain a smoker identity, which may motivate relapse (Nachtigal & Kidron, 2015; Vangeli, Stapleton, & West, 2010; Vangeli & West, 2012). One study showed that 53% and 16% of ex-smokers had a residual identity as a smoker after one and two years of abstinence, respectively (Vangeli et al., 2010), suggesting suggests that duration of behavior (e.g., smoking) may be important for identity strength.

In sum, previous studies showed that identity changes occur as part of the process of quitting smoking and appear to facilitate successful quitting. Therefore, it is important to know what factors instigate identity change and how nonsmoking can become increasingly integrated into the self-concept following a quit attempt. However, to our knowledge, only one study has investigated psychosocial correlates of smoker self-identity change, but this study focused on adolescent smokers (Hertel & Mermelstein, 2016). Importantly, identity change processes are likely to be different before and after a quit attempt. Whereas smokers may intend to quit and may identify with being a quitter as a possible self (Barreto & Frazier, 2012; Markus & Nurius, 1986), they do not yet engage in the behavior of quitting smoking. On the other hand, the identity as a quitter corresponds with ex-smokers' nonsmoking behavior. The current study therefore examines which factors predict change in smoker and quitter self-identity among smokers and ex-smokers. In the following we will first summarize the scarce research on predictors of identity change in the process of successfully quitting smoking and discuss relevant theories on identity change.

Potential Correlates of Change in Smoking-related Identities

The only study that directly examined correlates of identity change in smokers focused on adolescent smokers (Hertel & Mermelstein, 2016), and showed that smoker self-identities increased as smokers became more inclined to smoke in order to cope with negative emotions (motive for smoking). Furthermore, findings of other studies (not focused on correlates of identity change) shed some light on factors that may be associated with change from a smoker identity to becoming a nonsmoker. Identity change may be initiated by negative self-evaluative emotions (e.g., shame) and perceived stigma about being a smoker (Luck & Beagan, 2015). Furthermore, changes in identities relevant to smoking are likely to be associated with changes in attitudes toward quitting and smoking (Brown, 1996; Bottorff, Johnson, Irwin, & Ratner, 2000; Luck & Beagan, 2015). Moreover, social support facilitated identification with nonsmoking among older smokers who quit (Brown, 1996). Finally, identity change toward becoming a nonsmoker is likely to be more difficult for smokers who have more smokers in their social networks (Bottorff et al., 2000; Gibbons & Eggleston, 1996; Luck & Beagan, 2015). In sum, previous work suggests that several psychosocial factors may play a role in smoking-related identity change: motives for smoking, negative self-evaluative emotions, perceived stigma, attitudes, social support, and the number of smokers in the social network.

Identity Change Theories

Several theories have been developed to explain changes in self-identity and group-identity more broadly. Adopting a self-identity perspective, both identity shift theory (Kearney & O'Sullivan, 2003) and identity control theory (Burke, 2006) propose that

identity change is initiated by conflict. Specifically, identity shift theory suggests that accumulating evidence of conflict between behavior (e.g., smoking) and values (e.g., living healthily) may initiate identity change, and suggests that subsequent changes in identity affect, and are effected by, behavior change. However, smokers may also use rationalizations to justify identity conflict (Hoek, Maubach, Stevenson, Gendall, & Edwards, 2013). Identity control theory emphasizes conflict between meanings of two identities (e.g., smoker and parent) or conflict between an identity and self-relevant meanings in a situation (e.g., being a smoker and becoming pregnant) as initiators of identity change processes. People are then motivated to change the meaning of an identity to make it more compatible with another more important identity, or with self-relevant meanings of the situation. For example, a pregnant smoker may come to perceive her identity as a smoker in less negative terms in order to decrease conflict with her identity as a mother (e.g., perceiving her smoking as actually being positive because of her belief that quitting during pregnancy would cause stress that harms the unborn child).

Regarding group-identity, the social identity model of cessation maintenance (SIMCM: Frings & Albery, 2015) and the social identity model of recovery (SIMOR; Best et al., 2015) focus on identity change in recovery from addiction, and state that the social environment (i.e., therapeutic group or social network, respectively) plays a central role. The SIMCM emphasizes the importance of accessibility of identities, reasoning that people may hold multiple identities of which only those that are accessible in a specific situation are likely to affect behavior (Wheeler, DeMarree, & Petty, 2007). According to the SIMCM, therapeutic groups may facilitate stronger identification with recovery by increasing the accessibility of recovery identities (i.e., self-perception as someone in recovery from addiction), being a source of self-esteem and self-efficacy to stay abstinent, providing social support and discouraging relapse (Frings & Albery, 2015). Furthermore, the SIMOR (Best et al., 2015) states that people who are in recovery from addiction and identify with social groups that favor recovery, will internalize the group's norms and values. The new social identity and its associated norms will then guide their behavior, until the recovery identity is rooted in self-conceptualization and social norms become less important for behavior.

Current Study

The current study extends previous work and examines change, and psychosocial predictors of change in smoker and quitter self-identity, among continuing smokers as well as ex-smokers. Based on indications from previous research regarding potential relevant factors, we included SES (Meijer et al., 2015), attitudes (Bottorff et al., 2000; Brown, 1996; Luck & Beagan, 2015), self-evaluative emotions (Luck & Beagan, 2015), stigma (Luck & Beagan, 2015), perceived social norms (Best et al., 2015; Bottorff et al., 2000; Gibbons & Eggleston, 1996; Luck & Beagan, 2015) and social support for quitting (Brown, 1996;

Frings & Albery, 2015) as predictors of identity change. Motives for smoking (Hertel & Mermelstein, 2016) were not measured in the current data set. In addition, in line with identity shift theory, stating that accumulating evidence of conflict between behavior and values may precede identity change (Kearney & O'Sullivan, 2003), perceived health damage, health worries and acceptance of smoking were included. Latent growth curve modeling was used to model and predict identity change, and the models were cross-validated to assess generalizability beyond the initial sample. To the best of our knowledge, this is the first large-scale exploration of psychosocial predictors of change in smoker and quitter self-identity among adult smokers and ex-smokers. We aimed to answer the following research questions (RQ):

1. Do smoker and quitter self-identity differ between smokers and ex-smokers at baseline (RQ1a)? Do smoker and quitter self-identity develop over time in smokers and ex-smokers (RQ1b), and do changes in smoker and quitter self-identity differ between smokers and ex-smokers (RQ1c)? We hypothesized that smoker self-identity will be stronger, and quitter self-identity will be weaker at baseline (i.e., intercept) among smokers than ex-smokers. Also, we hypothesized that smoker self-identity will increase over time in smokers (i.e., positive slope), whereas it will decrease in ex-smokers (i.e., negative slope) and that quitter self-identity will decrease (i.e., negative slope) among smokers and increase among ex-smokers (i.e., positive slope).
2. Are changes in smoker and quitter self-identity predicted by SES and psychosocial factors (RQ2)? We hypothesized that stronger smoker self-identity at baseline (i.e., higher intercepts) and increases in smoker self-identity over time (i.e., positive slopes) are predicted by lower SES, stronger positive attitude toward smoking, stronger negative attitude toward quitting, weaker negative self-evaluative emotions about smoking, less perceived health damage, weaker health worries, stronger pro-smoking and weaker pro-quitting perceived social norms, weaker expected social support for quitting, weaker stigma of the typical smoker (i.e., own perception and perceived societal stigma), and stronger acceptance of smoking (i.e., own perception and perceived societal acceptance). Regarding quitter self-identity, we expected these associations to be in the opposite direction, such that, for example, higher SES would be associated with stronger baseline quitter self-identity and increased quitter self-identity over time.
3. Do associations between SES and psychosocial factors and smoker and quitter self-identity differ between smokers and ex-smokers (RQ3)?
4. How well do the models generalize beyond the initial sample (RQ4)?

METHOD

Participants

This study is part of the International Tobacco Control Policy Evaluation Project (www.itcproject.org) (Fong et al., 2006). We used data from the International Tobacco Control (ITC) Netherlands Survey, a longitudinal cohort study which started in 2008. The data used for the current study were collected in the Netherlands from 2009 to 2014 (henceforth referred to as waves 1-6, respectively). Participants were aged 16 or older, and were smokers or ex-smokers at enrollment. Participants who smoked at least monthly and had smoked at least 100 cigarettes in their lifetime were considered smokers, and those who had smoked monthly and had smoked at least 100 cigarettes but were now abstinent were considered ex-smokers. Participants could participate in subsequent waves regardless of smoking status and could also continue their participation if they had not participated in a previous wave. Participants who dropped out of the study were replaced, from the same sampling frame, in order to maintain sample size. Surveys were administered online or by telephone by the research firm TNS NIPO (see Appendix Table 1 for participant flow). The ITC Netherlands Surveys were cleared for ethics by the Human Research Ethics Committee of the University of Waterloo. The sample at each wave is representative of the Dutch smoking population (Nagelhout et al., 2010, 2016).

Initial analyses.

For the initial analyses, we used data that were collected annually between 2012 and 2014 (waves 4-6). Given changes in antismoking regulation in the Netherlands over time (i.e., the smoking ban in hospitality venues was reversed for small pubs in 2010), these data were considered more relevant than less recent data. The findings were cross-validated using less recent data from waves 1-3 (see the following text). Wave 4 had 2,022 participants (1,604 smokers), wave 5 had 1,970 participants (1,531 smokers) and wave 6 had 2,008 participants (1,569 smokers). Participants with full data for smoker or quitter self-identity at the three waves were included in the respective analyses (n = 943 and n = 869 for smoker and quitter self-identity, respectively; see Appendix Table 2A for attrition analyses). We first fitted models among continuing smokers only because a number of relevant covariates were not measured among ex-smokers and could therefore not be examined in multiple-group models (i.e., models that include and compare smokers and ex-smokers).[1] In addition, we performed multiple-group analyses to compare continuing smokers and ex-smokers, using covariates that were measured in both groups (see Statistical analyses). For this purpose the sample was divided into participants who smoked at waves 4-6 (i.e., continuing smokers; n = 742 and n = 674 for

1 In latent growth curve modelling the term 'covariate' is used to indicate predictor variables, and should not be confused with covariates in Analysis of Covariance (ANCOVA).

smoker and quitter self-identity, respectively) and participants who were ex-smokers at waves 4-6 (i.e., continuing ex-smokers; n = 201 and n = 195 for smoker and quitter self-identity, respectively). Of the smokers included in the models, 183 (25%) and 206 (28%) attempted to quit (unsuccessfully) between waves 4-5 and 5-6, respectively. Of the ex-smokers included in the models, 14 (7%) and 6 (3%) relapsed and quit smoking again between waves 4-5 and 5-6, respectively (see Appendix Table 3 for more information on background and smoking characteristics).

Cross-validation.

We cross-validated the models using data from 2009 to 2011 (waves 1-3), with 2,012 participants at wave 1 (1,763 smokers), 2,060 participants at wave 2 (1,723 smokers), and 2,101 participants at wave 3 (1,672 smokers). Again, participants with full smoker and quitter self-identity data were included in the respective models (N=721 and N=679 for smoker and quitter self-identity, respectively; see Appendix Table 2B for attrition analyses). The sample contained 651 and 611 continuing smokers and 70 and 68 ex-smokers for smoker and quitter self-identity, respectively. Of those included in the smoker and quitter self-identity cross-validation samples, 291 (40%) and 265 (39%) participants had also been part of the initial samples. See Appendix Table 3 for background and smoking characteristics.

Measures

Measures that were included in current analyses are described below. For variables with multiple items, scales were constructed by averaging scores on the individual items, unless indicated otherwise.

Identity outcome measures.

Outcome measures were measured in 2012-2014 (initial analyses) and 2009-2011 (cross-validation). Variables were recoded, such that higher scores indicated stronger identities.

Smoker self-identity.

Smoker self-identity was measured with two items, i.e. 'To continue smoking would fit with who you are' and 'To continue smoking would fit with how you want to live' for smokers, and 'To start smoking again would fit with who you are' and 'To start smoking again would fit with how you want to live' for ex-smokers, with answers ranging from [1] 'strongly agree' to [5] 'strongly disagree' (r = .82, .86, and .86 at waves 4, 5 and 6, respectively). Smoker self-identity was missing for 93, 127 and 53 participants at waves 4, 5 and 6, respectively.

Quitter self-identity.

Similarly, quitter self-identity was measured with two variables, e.g. 'To quit smoking (smokers)/stay quit (ex-smokers) within the next 6 months would fit with who you are', with answers ranging from [1] 'strongly agree' to [5] 'strongly disagree' (r = .83, .84, and .85 at waves 4, 5 and 6, respectively). Quitter self-identity was missing for 167, 233 and 149 participants at waves 4, 5 and 6, respectively.

Covariates.

Covariates were measured at wave 4 for the initial analyses (see Appendix Table 4 for descriptive statistics and missing values) and at wave 1 for cross-validation. Higher scores indicated that participants were higher on the concepts. For all models, the number of missing values in the covariates was well below 5%.

Covariates measured among smokers and ex-smokers.

SES.

Highest attained educational level was used to measure SES (Schaap & Kunst, 2008). Answer categories ranged from [1] 'no degree' to [7] 'university master', and [8] 'do not know/do not want to say' (recoded as missing). SES was converted into two dummy variables, representing middle SES (middle pre-vocational education, secondary education second stage) vs. lower SES (no degree, lower pre-vocational secondary education), and higher SES (senior general secondary education and pre-university education, higher professional education and university bachelor, university master) vs. lower SES.

Attitude.

Attitude toward smoking and *attitude toward quitting* were measured with one item each, i.e. 'What is your overall opinion on smoking?' and 'If you quit smoking within the next 6 months (for smokers)/If you stay quit (for ex-smokers), this would be…', with answer categories ranging from [1] 'very positive' to [5] 'very negative'. As such, higher scores indicated more negative attitudes and lower scores indicated more positive attitudes.

Perceived health damage.

Health damage was measured with one item, i.e. 'To what extent has smoking damaged your health?' with answer categories ranging from [1] 'not at all' to [4] 'a great deal'.

Perceived social norms.

Pro-smoking social norms were measured with one item, i.e. 'People think you should not smoke' with answers ranging from [1] 'strongly agree' to [5] 'strongly disagree'. *Pro-quitting social norms* were measured with one item, i.e. 'Thinking about the people who are important to you, how do you think most of them would feel about you quitting

smoking (smokers)/staying quit (ex-smokers) within the next 6 months?', with answers ranging from [1] 'strongly disapprove' to [5] 'strongly approve'.

Stigma.

Own stigma (α = .75) and *perceived stigma* (α = .74) were measured with five items each (i.e., nice, determined, free, persistent, pathetic (recoded)), for example 'To what extent do you (own stigma)/people in The Netherlands (perceived stigma) think of smokers as nice?' with answers ranging from [1] 'very nice' to [7] 'not at all nice'.

Acceptance of smoking.

Own acceptance of smoking (α = .74) and *perceived acceptance of smoking* (α = .73) were measured with five items each (i.e., on the street, in a pub, in a restaurant, in the presence of children, in a car with nonsmokers), for example 'To what extent do you (own acceptance)/people in The Netherlands (perceived acceptance) accept it when someone smokes in a pub?' with answers ranging from [1] 'very unacceptable' to [5] 'very acceptable'.

Covariates measured among smokers.

Self-evaluative emotions.

Self-evaluative emotions about smoking were measured with three items (i.e., hate, blame, angry), for example 'You are angry with yourself because you smoke' with answers ranging from [1] 'strongly agree' to [5] 'strongly disagree' (α = .89).

Self-evaluative emotions (outside).

Self-evaluative emotions when smoking outside were introduced as follows: 'On the first of July 2008 the hospitality industry became smoke-free. That means that you can only smoke inside if there is a special smoking room. In most cases you will have to smoke outside. How do you feel when you are smoking outside?' Self-evaluative emotions when smoking outside as a consequence of the Dutch smoking ban in hospitality venues were measured with five items, e.g., 'You're unhappy with yourself for smoking' with answers ranging from [1] 'strongly agree' to [5] 'strongly disagree' (α = .89).

Health worries.

Health worries were measured with one item, i.e. 'How worried are you, if at all, that smoking will damage your health in the future?' with answer categories ranging from [1] 'not at all worried' to [4] 'very worried'.

Expected social support.

Expected social support for quitting smoking was measured with two items, i.e. 'Suppose that you would like to quit smoking. How supportive do you think your spouse or partner (item 1)/friends and members of your family (item 2)would be?' Answer categories ranged from [1] 'very supportive' to [4] 'not at all supportive'. An average score was calculated when at least one item was answered (r = .58).

Cigarettes per day.

Participants were asked whether they smoked daily, at least weekly, or at least monthly, and how many cigarettes they smoked on average per day, week or month, respectively. For each participant, the average number of cigarettes smoked per day was calculated.

Statistical Analyses

The analyses were performed in several steps. The initial analyses were performed using data from waves 4-6, and data from waves 1-3 was used for cross-validation. We first fitted two models for smoker self-identity (Model 1) and quitter self-identity (Model 2) among continuing smokers only (i.e., smokers at waves 4-6), using the additional covariates that were measured only among smokers and not among ex-smokers. Secondly, we fitted two multiple-group models among continuing smokers and continuing ex-smokers (i.e., ex- smokers at waves 4-6) for smoker self-identity (Model 3) and quitter self-identity (Model 4). Each of these four models was estimated in two steps, that is, we first fitted a latent growth curve model without covariates (Step 1; RQ1) and then added the covariates to predict baseline and growth (Step 2; RQ2). Covariates were centered to facilitate the interpretation of intercepts and slopes (see Appendix Table 5 for means and (co)variances of latent intercepts and slopes).We also performed multiple-group analyses in Model 3 and 4 to compare smokers and ex-smokers (RQ3). The four final models were then cross-validated using data from waves 1-3 (Step 3; RQ4).

Analyses were performed in R (R Core Team, 2014), using the growth function of the lavaan package version 0.5-20 (Rosseel, 2012). We used robust maximum likelihood estimation (MLR) because not all variables were normally distributed. Transformation of variables was therefore not required (Enders, 2001). In addition, full information maximum likelihood (FIML) was used because some covariates had missing values. We therefore did not perform attrition analyses. For the remainder, default settings of the lavaan growth function were used.

Smokers subsample (Model 1 and 2).

Latent growth curve models without covariates were fitted using data from waves 4-6 for smoker self-identity (Model 1) and quitter self-identity (Model 2) separately (RQ1).

The models contained freely estimated means of the intercept and slope[2], variances of the intercept and slope, covariances between intercept and slope, and residual variances. We examined significance of model parameters and examined χ^2, comparative fit index (CFI), root mean square error of approximation (RMSEA), standardized root mean residual (SRMR), and Akaike information criterion (AIC) to assess model fit. Chi-square, CFI and RMSEA values were robust values (SRMR and AIC are not corrected when robust estimation is used). Non-significant model χ^2-values indicate that the model does not deviate significantly from the data, although χ^2-values are often significant in large samples. In addition, according to Hu and Bentler (1999), CFI values ≥ .95, SRMR values ≤ .08, and RMSEA values ≤ .06 indicate good model fit.

Second, we added SES and psychosocial variables (measured at wave 4) to predict the intercepts and slopes of smoker (Model 1) and quitter self-identity (Model 2) (RQ2). Third, the models with covariates were cross-validated using data from waves 1-3 to establish generalizability of the findings. We examined fit indices as well as model parameters to compare the cross-validated results to the initial results (RQ4).

Multiple-group analyses (Model 3 and 4).

Again, the multiple-group analyses were performed in three steps for smoker (Model 3) and quitter self-identity (Model 4) separately. First, latent growth curve models without covariates were fitted on waves 4-6 (RQ1), and then multiple-group analyses were performed for smokers and ex-smokers (RQ3). We started with the most complex model without any equality restrictions between groups. In line with the smokers-only analyses, this model contained freely estimated model parameters (multiple-group model 0; MG0). We then applied between-group equality restrictions on the intercept variances (MG1), slope variances (MG2), intercept/slope covariances (MG3), residual variances of manifest identity variables (MG4), mean intercept (MG5) and mean slope (MG6). As these models were nested, we used χ^2-difference tests and AIC to examine whether model fit decreased significantly with more restrictive models, compared with the previous less restrictive model with adequate fit. Models were retained when χ^2-difference tests yielded non-significant results. When the χ^2-difference was marginally significant ($p < .10$) the more restrictive model was also rejected. Furthermore, models with lower AIC values were taken to be better-fitting.

Second, latent growth curve multiple-group models with covariates (MGC) were fitted with SES and psychosocial variables as time-invariant covariates, based on the best fitting model without covariates (RQ2). We fitted a baseline model without any between-group equality restrictions on regression weights (i.e., configural invariance; MGC0) and then restricted regression weights to be equal across smokers and ex-smokers. We

2 We estimated a linear slope, which means that the development in identity is the same between wave 4 and 5, and wave 5 and 6.

assessed model fit as we did for the models without covariates. Third, we cross-validated the final models for smoker (Model 3) and quitter self-identity (Model 4) using data from waves 1-3 (RQ4).

RESULTS

Preliminary Analyses

Bivariate correlations showed that both smoker and quitter self-identity were strongly and positively correlated between time points among smokers (see Table 1; see Appendix Table 6 for correlations with covariates), suggesting that identity strength was relatively stable over time. Among ex-smokers medium-sized and positive correlations were found between measurements one year apart (i.e., wave 4-5, wave 5-6), but (as might be expected) correlations between wave 4 and 6 were weaker for both smoker and quitter self-identity. Furthermore, mean scores suggested that smoker self-identity increased slightly among smokers and decreased slightly among ex-smokers from wave 5 to wave 6. Unexpectedly, quitter self-identity appeared relatively stable among smokers and ex-smokers. After the preliminary analyses, we fitted two models among smokers (Model 1 and 2 for smoker and quitter self-identity, respectively), followed by two multiple-group models among smokers and ex-smokers (Model 3 and 4 for smoker and quitter self-identity, respectively).

Table 1. Descriptive statistics and correlations of smoker self-identity (ns_{mokers} = 742; $n_{ex\text{-}smokers}$ = 201) and quitter self-identity ($n_{smokers}$ = 674; $n_{ex\text{-}smokers}$ = 195) at waves 4, 5, and 6.

Smoker self-identity	**Smokers**				**Ex-smokers**			
		Correlations				***Correlations***		
	M (SD)	Wave 4	Wave 5	Wave 6	*M (SD)*	Wave 4	Wave 5	Wave 6
Wave 4	3.12 (.91)	1			1.51 (.74)	1		
Wave 5	3.11 (.93)	.64***	1		1.50 (.70)	.46***	1	
Wave 6	3.20 (.91)	.57***	.60***	1	1.35 (.67)	.13^{+}	.32***	1
Quitter self-identity		***Correlations***				***Correlations***		
	M (SD)	Wave 4	Wave 5	Wave 6	*M (SD)*	Wave 4	Wave 5	Wave 6
Wave 4	2.76 (.96)	1			4.48 (.75)	1		
Wave 5	2.76 (.97)	.62***	1		4.43 (.77)	.36***	1	
Wave 6	2.73 (.99)	.59***	.62***	1	4.52 (.82)	.14^{+}	.34***	1

*** $p < .001$, $^{+}p < .10$.

Smokers Subsample: Model 1 And 2

Smoker self-identity among smokers (Model 1).

Growth model without covariates.

The model without covariates fitted the data very well (see Table 2). Model χ^2 was significant, but this is common in larger samples ($\chi^2(1) = 4.52$, $p = .03$). The mean value of the intercept was significant (3.11, $p < .001$) and had significant variance (.61, $p < .001$), indicating that baseline smoker self-identity differed among smokers. Furthermore, the significant mean slope indicated that smoker self-identity increased over time (.04, $p = .01$), and the slope variance was significant (.05, $p = .03$), indicating variability in smoker self-identity growth. Moreover, the negative covariance between the intercept and slope (-.07, $p = .04$) indicated that stronger baseline smoker self-identities were associated with decreases in smoker self-identities over time. Finally, residual variances of manifest variables were significant (all p values < .001).

Table 2. Fit of latent growth curve models for smoker self-identity (Model 1; n = 742) and quitter self-identity (Model 2; n = 674): smokers only.

Model	Fit Measures				
	df	χ^2	CFI	RMSEA	SRMR
1. Smoker self-identity without covariates	1	4.52*	.991	.069	.016
1. Smoker self-identity with covariates	17	21.46	.996	.019	.009
2. Quitter self-identity without covariates	1	.31	1.00	.00	.004
2. Quitter self-identity with covariates	17	13.60	1.00	.000	.007

* $p < .05$

Prediction of smoker self-identity baseline and growth.

The model with covariates did not deviate significantly from the data ($\chi^2(17) = 21.46$, $p = .21$) and showed good fit (see Table 2). As expected, stronger baseline smoker self-identity (i.e., higher intercepts) was associated with lower SES (vs. middle and higher SES), more positive attitudes toward smoking, more negative attitudes toward quitting, less negative self-evaluative emotions about smoking in general and when smoking outside, less health worries, less own stigma, stronger own acceptance of smoking, and more cigarettes smoked per day (see Table 3).

As expected, smoker self-identity increased over time among lower SES smokers (vs. higher SES). In addition, two effects emerged that were contrary to our expectations (but these effects were not replicated in the cross-validation): smoker self-identity decreased among smokers with more negative attitudes toward quitting and less negative self-evaluative emotions about smoking.

Cross-validation.

Cross-validation showed that the final model generalized well. The cross-validated model did not deviate significantly from the data ($\chi^2(17) = 19.97$, $p = .28$) and other fit indices confirmed good fit (CFI = .997, RMSEA = .016, SRMR = .011). Results of the cross-validated model were similar to the initial results with regard to prediction of the intercept. However, the association between the intercept and own acceptance became marginally significant, and associations with SES (higher vs. lower, middle vs. lower) and own stigma became non-significant. None of the predictors of the slope that were found in waves 4-6 were found, but a significant effect of expected support emerged, such that smoker self-identity decreased among smokers who expected more support for quitting ($b = -.05$, $\beta = -.15$, $p = .02$). In sum, both the initial and cross-validated model showed that stronger baseline smoker self-identity was associated with more positive attitudes toward smoking, more negative attitudes toward quitting, less negative self-evaluative emotions in general and when smoking outside, and less health worries. However, the effects of SES were only found in the initial analyses.

Quitter self-identity among smokers (Model 2).

Growth model without covariates.

The model without covariates showed good fit (see Table 2) and did not deviate significantly from the data ($\chi^2(1) = .31$, $p = .58$). The mean value of the intercept was significant (2.76, $p < .001$) and had significant variance (.63, $p < .001$). The mean slope was nonsignificant (-.02, $p = .39$), but the slope variance was marginally significant (.06, $p = .06$), indicating some variability in change in quitter self-identity. Finally, the covariance between intercept and slope was nonsignificant (-.05, $p = .16$) and residual variance of manifest variables were significant (all p values < .001).[3]

Prediction of quitter self-identity baseline and growth.

The model with covariates did not deviate significantly from the data ($\chi^2(17) = 13.60$, $p = .70$) and showed almost perfect fit (see Table 2). As expected, stronger baseline quitter self-identity was significantly associated with more negative attitudes toward smoking, more positive attitudes toward quitting, more negative self-evaluative emotions about smoking, more health worries, and fewer cigarettes smoked per day (see Table 3).

Moreover, and as expected, quitter self-identity increased over time among higher SES smokers (vs. lower SES). In addition, two effects emerged that were contrary to our expectations: quitter self-identity increased over time among smokers with less nega-

3 Because the mean slope, slope variance and latent covariance were nonsignificant, we also fitted a model without a slope. Although this model had adequate fit, it did not fit the data as well as the model that included a latent slope.

Table 3. Predictors of intercepts and slopes of smoker self-identity (Model 1; n = 742) and quitter self-identity (Model 2; n = 674) among smokers only: final latent growth curve models with covariates.

	Intercept			
	***Smoker self-identity* (Model 1)**		***Quitter self-identity* (Model 2)**	
	***b*(SE)**	**β**	***b*(SE)**	**β**
SES (middle vs. low)	-.19 (.05)***	-.12***	.02 (.06)	.01
SES (high vs. low)	-.17 (.07)*	-.09*	.02 (.08)	.01
Negative attitude smoking	-.22 (.05)***	-.19***	.13 (.05)*	.11*
Negative attitude quitting	.19 (.04)***	.21***	-.18 (.05)***	-.18***
Self-evaluative emotions	.19 (.05)***	.24***	-.34 (.04)***	-.43***
Self-evaluative emotions outside	.18 (.07)**	.16**	-.05 (.07)	-.04
Perceived health damage	-.05 (.05)	-.04	.06 (.05)	.05
Health worries	-.12 (.05)*	-.10*	.17 (.06)**	.15**
Perceived pro-smoking norms	-.05 (.03)	-.07	.02 (.03)	.03
Perceived pro-quitting norms	.01 (.04)	-.01	-.01 (.04)	-.01
Expected social support	.07 (.03)$^{+}$	.07^{+}	-.01 (.03)	-.02
Stigma own	-.09 (.03)*	-.10*	.04 (.04)	.04
Stigma perceived	.06 (.03)$^{+}$	.08^{+}	-.05 (.03)$^{+}$	-.07^{+}
Acceptance own	.10 (.05)*	.08*	-.09 (.05)$^{+}$	-.08^{+}
Acceptance perceived	-.06 (.06)	-.04	.09 (.06)	.06
Cigarettes per day	.01 (.00)**	.12**	-.02 (.00)***	-.15***
	Slope			
	***Smoker self-identity* (Model 1)**		***Quitter self-identity* (Model 2)**	
	b(SE)	β	*b*(SE)	β
SES (middle vs. low)	-.03 (.04)	-.05	.04 (.04)	.07
SES (high vs. low)	-.10 (.04)*	-.15*	.14 (.05)**	.20**
Negative attitude smoking	-.01 (.03)	-.02	-.02 (.04)	-.05
Negative attitude quitting	-.07 (.03)*	-.20*	.05 (.04)	.14
Self-evaluative emotions	-.07 (.03)*	-.25*	.09 (.03)**	.31**
Self-evaluative emotions outside	.05 (.04)	.14	-.06 (.04)	-.15
Perceived health damage	.03 (.03)	.09	-.02 (.03)	-.05
Health worries	-.04 (.04)	-.10	.01 (.04)	.03
Perceived pro-smoking norms	.02 (.02)	.09	-.01 (.02)	-.05
Perceived pro-quitting norms	.00 (.03)	.01	.03 (.03)	.10
Expected social support	-.03 (.02)$^{+}$	-.09^{+}	.03 (.02)	.08
Stigma own	.04 (.02)$^{+}$	.13^{+}	-.06 (.03)*	-.18*
Stigma perceived	-.01 (.02)	-.05	.04 (.02)	.12
Acceptance own	-.06 (.03)$^{+}$	-.15^{+}	.02 (.04)	.04
Acceptance perceived	.03 (.03)	.08	-.04 (.04)	-.09
Cigarettes per day	.00 (.00)	-.02	.00 (.00)	.05

$^{+}$ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

tive self-evaluative emotions about smoking and among smokers with less own stigma (but the latter effect was not replicated in the cross-validation).

Cross-validation.

Cross-validation showed that the final model generalized well (CFI = .959, RMSEA = .048, SRMR = .018). Model χ^2 was significant, but this is common is large samples ($\chi^2(17)$ = 41.23, p = .001). Cross-validated results were very similar to the initial results. However, the unexpected effect of own stigma on the slope was no longer significant. In addition, in the cross-validated model quitter self-identity at baseline was stronger when smokers experienced more negative self-evaluative emotions when smoking outside (b = -.14, β = -.14, p = .03), or were less accepting of smoking (b = -.15, β = -.14, p = .01). In addition, quitter self-identity increased over time among middle (vs. lower) SES smokers (b = .13, β = .14, p = .049). In sum, in both the initial and cross-validation analyses, stronger baseline quitter self-identities were associated with more negative attitudes toward smoking, more positive attitudes toward quitting, more negative self-evaluative emotions, more health worries and less own acceptance of smoking. In addition, both the initial and cross-validated model showed that quitter self-identity increased over time among higher SES smokers compared to lower SES smokers.

Multiple-group Analyses: Model 3 and 4

Smoker self-identity among smokers and ex-smokers (Model 3).

Growth model without covariates.

We first performed multiple-group analyses on the model without covariates (see Appendix Table 7A). Equality restrictions could be applied to the intercept variances (MG1) without significantly decreasing model fit compared to MG0. However, other between-group equality restrictions decreased model fit. The final model (MG1) had good fit (CFI = .990, RMSEA = .060, SRMR = .037). As expected, in the final model (MG1) smokers had a higher mean smoker self-identity intercept (3.10, p < .001) than ex-smokers (1.52, p < .001). Furthermore, and as expected, smoker self-identity increased over time among smokers (.04, p = .01) whereas it decreased among ex-smokers (-.07, p = .04). Intercept variances were significant in both groups (.56, p < .001). Moreover, the slope variance was significant among ex-smokers (.17, p < .001) but not among smokers (.04, p = .12). Finally, the covariance between the intercept and slope was significant and negative among ex-smokers (-.25, p < .001) but not among smokers (-.05, p = .13). As such, smoker self-identities decreased among ex-smokers who identified more with smoking at baseline.

Table 4. Predictors of intercepts and slopes of smoker self-identity among smokers (n = 742) and ex-smokers (n = 201): final latent growth curve model with covariates (Model 3).

	Intercept			
	Smokers		***Ex-smokers***	
	b(SE)	β	*b*(SE)	β
SES (middle vs. low) [E]	-.15 (.05)**	-.10**	-.15 (.05)**	-.11**
SES (high vs. low)	-.15 (.07)*	-.08*	.05 (.09)	.03
Negative attitude smoking [E]	-.31 (.04)***	-.28***	-.31 (.04)***	-.35***
Negative attitude quitting	.30 (.04)***	.31***	.43 (.08)***	.35***
Perceived health damage	-.13 (.05)**	-.12**	.13 (.07)$^{+}$	.14^{+}
Perceived pro-smoking norms	-.01 (.03)	-.01	-.07 (.04)$^{+}$	-.10^{+}
Perceived pro-quitting norms	-.02 (.04)	-.02	.08 (.05)$^{+}$	.10^{+}
Stigma own	-.15 (.04)***	-.17***	-.02 (.05)	-.03
Stigma perceived	.04 (.03)	.05	-.06 (.05)	-.08
Acceptance own	.24 (.05)***	.21***	-.04 (.08)	-.04
Acceptance perceived [E]	-.10 (.05)$^{+}$	-.07^{+}	-.10 (.05)$^{+}$	-.09^{+}
	Slope			
	Smokers		***Ex-smokers***	
	b(SE)	β	*b*(SE)	β
SES (middle vs. low) [E]	-.03 (.03)	-.06	-.03 (.03)	-.04
SES (high vs. low) [E]	-.14 (.04)***	-.22***	-.14 (.04)***	-.19***
Negative attitude smoking	-.02 (.03)	-.06	.14 (.04)***	.29***
Negative attitude quitting [E]	-.09 (.03)**	-.28**	-.09 (.03)**	-.13**
Perceived health damage	.03 (.03)	.09	-.12 (.05)*	-.25*
Perceived pro-smoking norms [E]	.02 (.02)	.09	.02 (.02)	.06
Perceived pro-quitting norms	.00 (.03)	.01	-.10 (.04)**	-.22**
Stigma own [E]	.04 (.02)*	.13*	.04 (.02)*	.09*
Stigma perceived [E]	-.01 (.02)	-.04	-.01 (.02)	-.02
Acceptance own	-.08 (.03)**	-.20**	.10 (.04)*	.19*
Acceptance perceived [E]	.05 (.03)$^{+}$	.12^{+}	.05 (.03)$^{+}$	.09^{+}

Note. E = Equal between groups.
$^{+}p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Prediction of smoker self-identity baseline and growth.

Fit measures indicated that the final model with covariates (MGC4), based on MG1, fitted the data very well (CFI = .997, RMSEA = .013, SRMR = .014; see Appendix Table 7B). Despite the large sample, the model did not deviate significantly from the data, $\chi^2(35) = 37.98$, $p = .34$.

All associations with the intercept (i.e., baseline identity) were in the expected direction. Among both smokers and ex-smokers, smoker self-identity was significantly stronger at baseline among those with lower SES (vs. middle SES), and when attitudes toward smoking were more positive (see Table 4). In addition, lower SES smokers (but not ex-smokers) had stronger baseline smoker self-identities than *higher* SES smokers, and smokers with more negative attitudes toward *quitting*, less perceived health damage and less own stigma had stronger baseline smoker self-identities. Ex-smokers

(but not smokers) with more negative attitudes toward quitting had stronger baseline smoker self-identities.

Furthermore, and as expected, smoker self-identity decreased over time among both smokers and ex-smokers with higher SES (vs. lower SES). Moreover, smoker self-identity decreased among ex-smokers (but not smokers), who perceived more health damage and pro-quitting norms. In addition, four unexpected findings emerged (but all except one were not replicated in the cross-validation analyses): In both groups, smoker self-identity decreased with more negative attitudes toward quitting and increased with more own stigma. In addition, smoker self-identity decreased among smokers who were more accepting of smoking, and increased among ex-smokers who held more negative attitudes toward smoking.

Cross-validation.

Cross-validation of the final MGC showed that the model generalized well. Specifically, the cross-validated model did not deviate significantly from the data despite the large sample size ($\chi^2(36) = 40.25$, $p = .29$) and other fit measures confirmed good fit (CFI = .995, RMSEA = .018, SRMR = .015).[4] Cross-validated results showed similar associations between covariates and the intercepts as were found in the initial analyses, although higher SES did not predict lower baseline smoker self-identity among smokers. However, no predictors of the smoker self-identity slope were found, except for the unexpected association between more negative attitude toward smoking and increasing smoker self-identity among ex-smokers. In sum, both the initial and cross-validated model showed that, among smokers and ex-smokers, baseline smoker self-identities were stronger among those with lower SES (vs. middle SES), more positive attitudes toward smoking and more negative attitudes toward quitting. Moreover, smokers (but not ex-smokers) identified more strongly with smoking at baseline when they perceived less health damage and had less own stigma and more own acceptance of smoking. With regard to prediction of the slope, only the contrary finding that smoker self-identity increased over time among ex-smokers with more negative attitudes toward smoking was found in both the initial and cross-validation analyses.

Quitter self-identity among smokers and ex-smokers (Model 4).

Growth model without covariates.

We first performed multiple-group analyses on the model without covariates (see Appendix Table 8A). In contrast to results for smoker self-identity, MG6 showed the best fit with the data (CFI = 1.00, RMSEA = .000, SRMR = .021). Slope variances, latent covariances, residual variances and mean slopes were equal between groups, and intercept

4 The slope variance was set to zero among ex-smokers because it was negative in the original cross-validated model.

variances and mean intercepts were freely estimated. As expected, smokers had a lower mean quitter self-identity intercept (2.75, $p < .001$) than ex-smokers (4.49, $p < .001$). Intercept variances were significant among smokers (.65, $p < .001$) and ex-smokers (.27, $p < .001$). Unexpectedly, the mean slope of quitter self-identity was non-significant in both groups (-.01, $p = .65$). However, the slope variance was significant in both groups (.08, $p < .01$), indicating individual variability in development of quitter self-identity. Moreover, the covariance between the intercept and slope was significant and negative in both groups (-.07, $p = .02$), such that quitter self-identity decreased over time among those with stronger quitter self-identities at baseline.

Table 5. Predictors of intercepts and slopes of quitter self-identity among smokers ($n = 674$) and ex-smokers ($n = 195$): final latent growth curve model with covariates (Model 4).

	Intercept			
	Smokers		***Ex-smokers***	
	b(SE)	β	*b*(SE)	β
SES (middle vs. low) [E]	.07 (.06)	.05	.07 (.06)	.07
SES (high vs. low) [E]	.08 (.07)	.04	.08 (.07)	.08
Negative attitude smoking [E]	.24 (.04)***	.21***	.24 (.04)***	.36***
Negative attitude quitting	-.36 (.05)***	-.38***	-.57 (.08)***	-.63***
Perceived health damage	.16 (.05)**	.15**	-.02 (.05)	-.03
Perceived pro-smoking norms [E]	-.02 (.03)	-.02	-.02 (.03)	-.03
Perceived pro-quitting norms [E]	-.03 (.03)	-.03	-.03 (.03)	-.04
Stigma own	.12 (.04)**	.13**	-.10 (.06)$^{+}$	-.19^{+}
Stigma perceived	-.03 (.04)	-.04	.07 (.05)	.11
Acceptance own	-.24 (.05)***	-.21***	-.03 (.08)	-.04
Acceptance perceived [E]	.12 (.05)*	.09*	.12 (.05)*	.15*
	Slope			
	Smokers		***Ex-smokers***	
	b(SE)	β	*b*(SE)	β
SES (middle vs. low)	.02 (.04)	.03	.15 (.06)**	.27**
SES (high vs. low) [E]	.13 (.04)**	.21**	.13 (.04)**	.24**
Negative attitude smoking	-.01 (.03)	-.03	-.16 (.05)**	-.42**
Negative attitude quitting [E]	.09 (.03)**	.29**	.09 (.03)**	.19**
Perceived health damage [E]	.00 (.02)	.00	.00 (.02)	.00
Perceived pro-smoking norms [E]	.00 (.02)	-.02	.00 (.02)	-.02
Perceived pro-quitting norms [E]	.06 (.03)*	.19*	.06 (.03)*	.18*
Stigma own	-.07 (.03)**	-.21**	-.01 (.04)	-.03
Stigma perceived [E]	.02 (.02)	.09	.02 (.02)	.08
Acceptance own	.03 (.03)	.08	-.13 (.06)*	-.34*
Acceptance perceived [E]	-.05 (.03)$^{+}$	-.12^{+}	-.05 (.03)$^{+}$	-.12^{+}

Note. E = Equal between groups.

$^{+}p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Prediction of quitter self-identity baseline and growth.

Fit measures indicated that the final model with covariates (MGC4), which was based on MG6, fitted the data very well (CFI = 1.00, RMSEA = .000, SRMR = .012; see Appendix Table 8B). Despite the large sample, the model did not deviate significantly from the data, $\chi^2(43) = 32.78$, $p = .87$.

In line with expectations, results showed that in both groups more negative attitudes toward smoking were associated with stronger baseline quitter self-identity, and more negative attitudes toward quitting were associated with weaker baseline quitter identities in both groups (see Table 5). Furthermore, and also as expected, smokers (but not ex-smokers) with more perceived health damage, more own stigma, and less own acceptance of smoking had stronger baseline quitter self-identities. Finally, we found an unexpected effect of perceived acceptance on the intercept in both groups, but this effect was due to suppression (specifically, quitter self-identity at baseline appeared stronger when perceived acceptance was higher, but this effect turned into the expected direction when only perceived acceptance was used to predict the intercept and slope, $b = -.12$, $\beta = -.14$, $p = .02$).

Results further showed, as expected, that in both groups quitter self-identity increased among higher SES participants (compared to lower SES), and when perceived pro-quitting norms were stronger. In addition, quitter self-identity increased among middle SES (vs. lower SES) ex-smokers, and among ex-smokers with less own acceptance of smoking, but this was not found among smokers. Finally, four unexpected effects were found, such that quitter self-identity increased among smokers and ex-smokers with more negative attitudes toward quitting, decreased among smokers with more own stigma, and decreased among ex-smokers with more negative attitudes toward smoking.

Cross-validation.

Cross-validation showed that the model generalized well. Model χ^2 was significant ($\chi^2(43) = 66.69$, $p = .01$), but this is common in larger samples. Importantly, fit measures indicated good fit (CFI = .973, RMSEA = .040, SRMR = .020). Cross-validated results were similar to those found in the initial analyses. However, the positive association between own stigma and the quitter self-identity intercept became marginally significant among smokers, and the effects of SES (middle vs. lower) and own acceptance on the quitter self-identity slope became nonsignificant among ex-smokers. In addition, an effect of perceived pro-smoking norms emerged in the cross-validated model, such that stronger perceived pro-smoking norms were associated with weaker baseline quitter self-identity (i.e., lower intercept) among smokers ($b = -.10$, $\beta = -.14$, $p < .01$) and ex-smokers ($b = -.10$, $\beta = -.15$, $p < .01$). In sum, most associations with the intercept were replicated in the cross-validation analyses, i.e., stronger baseline quitter self-identity was associated with

more negative attitudes toward smoking and more positive attitudes toward quitting among smokers and ex-smokers, and with more perceived health damage and less own acceptance among smokers (but not ex-smokers). In addition, in both the initial and cross-validation analyses, quitter self-identity increased over time among those with higher SES (vs. lower SES), and among those who perceived stronger pro-quitting social norms. Finally, four unexpected effects on the slope were found in both the initial and cross-validation analyses.

DISCUSSION

The current study is the first to longitudinally examine changes in smoker and quitter self-identity among a large sample of smokers and ex-smokers, and to investigate whether baseline identity and identity development could be predicted by SES and psychosocial factors. We used latent growth curve modeling as an advanced statistical technique to model and predict identity change, and then cross-validated the models to establish generalizability of the findings. Overall, results generalized well beyond the initial analyses to the cross-validation sample (RQ4).

Results confirmed that smokers perceive themselves more as smokers and less as quitters than do ex-smokers (RQ1). Furthermore, results provided new insights in identity change, showing that identification with smoking increases over time among smokers, whereas it decreases among ex-smokers, confirming the hypotheses. Unexpectedly, average quitter self-identity does not change significantly over time among smokers and ex-smokers as groups, although the results showed individual variability in quitter self-identity change in both groups. As such, identification with quitting does change over time in individual smokers and ex-smokers.

Furthermore, results showed that psychosocial factors are relevant for baseline identity and identity development (RQ2), even after controlling for smoking behavior. Perceived stigma was the only covariate that was unrelated to any outcome, and pro-smoking social norms were only related to baseline quitter self-identity in the cross-validation sample. Socio-economic status appears particularly important, as it is the only covariate that is associated with baseline identity and identity development among smokers and ex-smokers. Specifically, lower SES smokers (vs. middle and higher SES) and lower SES ex-smokers (vs. middle SES) identify more with smoking. In addition, smoker self-identities decrease and quitter self-identities increase over time among higher SES smokers and ex-smokers. This corresponds with previous work showing that lower SES smokers have more difficulty picturing themselves as nonsmokers than higher SES smokers (Meijer et al., 2015). Moreover, the current study extended these findings to ex-smokers, and also showed that higher SES smokers and ex-smokers move away from

smoking and toward quitting more quickly than their lower SES counterparts. In other words, smoker- and quitter-identities appear more resistant to change among lower SES groups. Correspondingly, previous work shows that lower SES smokers are less likely to quit, have worse experiences with quitting, and relapse more often (e.g., Fernandez et al., 2006; Pisinger et al., 2011; Reid et al., 2010; Wetter et al., 2005). In addition, people with lower SES-backgrounds appear to have lower self-concept clarity in general than people with higher SES (Na, Chan, Lodi-Smith, & Park, 2016).

In addition to SES, only stronger perceived pro-quitting social norms are important for *changes* in identification with quitting over time among both smokers and ex-smokers (not taking contrary effects into account). Moreover, ex-smokers who perceive stronger pro-quitting norms identify less with smoking over time. The other psychosocial variables are not associated with identity change. The importance of pro-quitting social norms corresponds with recent models on social identity change in the context of recovery from addiction, which underscore that pro-recovery social norms may facilitate increasing identification with recovery (Best et al., 2015, Frings & Albery, 2015). Relatedly, work on identity compatibility shows that people more easily adopt new identities that fit in with their social environment (Iyer, Jetten, Tsibrikos, Postmes, & Haslam, 2009).

Results further showed that attitudes are consistently associated with baseline identities, but not with identity *change*. Specifically, more positive attitudes toward smoking and more negative attitudes toward quitting are associated with stronger smoker self-identities and weaker quitter self-identities at baseline in both groups. This is in line with qualitative work that suggests that attitudes toward smoking and smoking-related self-perceptions are associated (Bottorff et al., 2000; Brown, 1996; Luck & Beagan, 2015; see also De Bruijn et al., 2012). Importantly, although attitude and identity are clearly associated, a meta-analysis on self-identity and the theory of planned behavior showed that attitude and identity uniquely predict intentions to engage in health behavior (Rise, Sheeran, & Hukkelberg, 2010), implying that attitude and identity are separate constructs.

Multiple-group analyses, comparing smokers and ex-smokers, further showed that own acceptance of smoking and perceived health damage are related to baseline identity among smokers only and to identity development among ex-smokers only, indicating that some correlates of identity differ before and after quitting smoking (RQ3). Notably, the identities as quitter and smoker have different roles among smokers and ex-smokers. The identity as a quitter likely is a possible self (Barreto & Frazier, 2012; Markus & Nurius, 1986) for smokers and a current self for ex-smokers, whereas the identity as a smoker likely is a current self for smokers, and may be a past, current (Vangeli et al., 2010), or (undesired) possible self for ex-smokers. Possible and current selves affect behavior differently. Possible selves are important guides for behavior, as people are motivated to achieve desired possible selves and avoid negative possible selves (Barreto

& Frazier, 2012; Markus & Nurius, 1986). Furthermore, people strive for a positive view of their current self and behave in line with strong current identities (e.g., West, 2006).

The smokers-only models (with additional covariates measured among smokers but not ex-smokers; Model 1 and 2) showed that smokers who experience more negative self-evaluative emotions about smoking and worry more about their future health have stronger quitter self-identities and weaker smoker self-identities. In addition, more negative self-evaluative emotions when smoking outside (as a consequence of the Dutch smoking ban in hospitality venues) and more expected support for quitting smoking are associated with weaker smoker self-identity.

Finally, we found a number of effects on identity development (i.e., slopes) that were unexpected and contrasted effects on baseline identity (i.e., intercepts), but many were not replicated in the cross-validation analyses. However, in both the initial and cross-validation analyses, less negative self-evaluative emotions about smoking and less own smoker stigma were associated with increasing quitter self-identity among smokers, more negative attitudes toward smoking were associated with increasing smoker self-identity and decreasing quitter self-identity among ex-smokers, and more negative attitudes toward quitting were associated with increasing quitter self-identity among smokers and ex-smokers. Future research is needed to assess replicability of these findings in other samples.

The current study has limitations. First, although the longitudinal design allowed for examination of (precedents of) identity change over time, analysis of subtler changes in identity was not possible due to the yearly interval between measurements. Moreover, finer-grained processes such as conflicts between identities and self-relevant situations (e.g., becoming pregnant) are likely to be relevant (Burke, 2006). Weekly or daily measurements, for example through mobile phones (Scholz et al., 2016), would allow for examination of such processes. Second, about a quarter of smokers undertook at least one unsuccessful quit attempt between the waves, and a very small minority of ex-smokers relapsed and quit again, which might have affected the findings. Weekly or daily measurements as described above will further insight in this respect. Relatedly, we did not include people with changing smoking statuses across waves (e.g., someone who was a smoker, ex-smoker, and smoker at waves 4-6, respectively), because this group would have been too heterogeneous to draw reliable conclusions and an even larger sample than that used in the current study would be needed to enable analysis of specific subgroups. This approach, as well as selective attrition, may have affected representativeness, although the samples at each of the waves were representative of the Dutch population of smokers (Nagelhout et al., 2010, 2016). Importantly, our approach ensured validity of responses over time, as current smoking status may affect the way people answer the questions. Third, the cross-validation sample differed in some respects from the initial sample, which may explain why some findings were not

confirmed in the cross-validation analyses. The cross-validation sample contained relatively few ex-smokers and more lower SES and slightly younger participants, and more ex-smokers in the cross-validation sample than in the initial sample relapsed between waves. Relatedly, although the majority of participants in the cross-validation sample were not included in the initial sample, 40% of participants in the cross-validation sample had also been part of the initial sample, such that, to some extent, the same participants were modeled. Fourth, the selection of psychosocial predictors was limited to factors that appeared relevant in previous work and were measured in the current study, but other factors may also be relevant (e.g., motives for smoking, self-efficacy). Fifth, income could have been used in addition to educational level to measure SES (Schaap, Van Agt, & Kunst, 2008), although educational level is a better indicator of risk of smoking than income (Schaap & Kunst, 2009). Finally, as is inevitable in large-scale longitudinal studies, identity constructs and most psychosocial variables were measured with only one to three items. However, this did enable us to include a wide range of psychosocial factors that appeared to be relevant in previous work, to explain and predict identity and changes in identity.

Notwithstanding these limitations, our results have important implications. The significance of SES (i.e., identity is more resistant to change among those with lower SES) suggests that efforts to strengthen identification with quitting and decrease identification with smoking should be aimed primarily at lower SES smokers and ex-smokers. Findings further suggest that strengthening social norms in favor of quitting may be a useful approach to influence identity, for example by adding such elements to mass media smoking cessation campaigns or (group) smoking cessation interventions. In addition, interventions could directly focus on facilitating identity change. Previous work suggests that interventions that use narratives (McAdams & McLean, 2013; Parry, Fowkes, & Thomson, 2001; Pennebaker, 2004; 2010) or avatars (Song, Kim, Kwon, & Jung, 2013) may help smokers and ex-smokers increase identification with quitting and decrease identification with smoking. There is evidence to suggest that quitter self-identity may be even more important as a target for such interventions than smoker self-identities, as quitter identities are more relevant for smoking cessation (Meijer et al., 2015, 2016, 2017). Furthermore, because identity appears to be related to different factors among smokers and ex-smokers, identity interventions will need to be tailored to smoking status.

To conclude, this was the first large-scale longitudinal study to examine change, and predictors of change, in smoker and quitter self-identity among smokers and ex-smokers. Results showed that smoker and quitter self-identity differ between smokers and ex-smokers, that identity can be predicted by SES and psychosocial constructs, and that processes with regard to changes in identity may differ between smokers and ex-smokers. SES and perceived pro-quitting social norms appear particularly important for

identity *change* among both smokers and ex-smokers, and should be taken into account when developing ways to facilitate identity change.

REFERENCES

Barreto, M. L., & Frazier, L. D. (2012). Coping with life events through possible selves. *Journal of Applied Social Psychology, 42*, 1785–1810.

Best, D., Beckwith, M., Haslam, C., Alexander Haslam, S. A., Jetten, J., Mawson, E., & Lubman, D. I. (2015). Overcoming alcohol and other drug addiction as a process of social identity transition: The Social Identity Model of Recovery (SIMOR). *Addiction Research & Theory*, *24*(2), 1-13.

Bottorff, J. L., Johnson, J. L., Irwin, L. G., & Ratner, P. A. (2000). Narratives of smoking relapse: The stories of postpartum women. *Research in Nursing & Health*, *23*(2), 126-134.

Brown, J. M. (1996). Redefining smoking and the self as a nonsmoker. *Western Journal of Nursing Research*, *18*(4), 414-428.

Burke, P. J. (2006). Identity change. *Social Psychology Quarterly*, *69*(1), 81-96.

De Bruijn, G. J., Verkooijen, K., De Vries, N. K., & Van den Putte, B. (2012). Antecedents of self identity and consequences for action control: An application of the theory of planned behavior in the exercise domain. *Psychology of Sport and Exercise*, *13*(6), 771-778.

Enders, C. K. (2001). The impact of nonnormality on full information maximum-likelihood estimation for structural equation models with missing data. *Psychological Methods, 6*(4), 352.

Férnandez, E., Schiaffino, A., Borrell, C., Benach, J., Ariza, C., Ramon, J. M., … Kunst, A. (2006). Social class, education, and smoking cessation: Long-term follow-up of patients treated at a smoking cessation unit. *Nicotine & Tobacco Research, 8*(1), 29-36.

Fong, G. T., Cummings, K. M., Borland, R., Hastings, G., Hyland, A., Giovino, G. A., ... & Thompson, M. E. (2006). The conceptual framework of the International Tobacco Control (ITC) policy evaluation project. *Tobacco Control*, *15*(suppl 3), iii3-iii11.

Frings, D., & Albery, I. P. (2015). The Social Identity Model of Cessation Maintenance: Formulation and initial evidence. *Addictive Behaviors*, *44*, 35-42.

Gibbons, F. X. & Eggleston, T. J. (1996). Smoker networks and the "typical smoker": A prospective analysis of smoking cessation. *Health Psychology, 15*(6), 469-477.

Hertel, A. W., & Mermelstein, R. J. (2012). Smoker identity and smoking escalation among adolescents. *Health Psychology*, *31*(4), 467-475.

Hertel, A. W., & Mermelstein, R. J. (2016). Smoker identity development among adolescents who smoke. *Psychology of Addictive Behaviors, 30*(4), 475-483.

Hoek, J., Maubach, N., Stevenson, R., Gendall, P., & Edwards, R. (2013). Social smokers' management of conflicted identities. *Tobacco Control*, *22*(4), 261-265.

Høie, M., Moan, I. S., & Rise, J. (2010). An extended version of the theory of planned behavior: Prediction of intentions to quit smoking using past behavior as moderator. *Addiction Research and Theory, 18*(5), 572-585.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1-55.

Iyer, A., Jetten, J., Tsivrikos, D., Postmes, T., & Haslam, S. A. (2009). The more (and the more compatible) the merrier: Multiple group memberships and identity compatibility as predictors of adjustment after life transitions. *British Journal of Social Psychology*, *48*(4), 707-733.

Kearney, M. H. & O'Sullivan, J. (2003). Identity shifts as turning points in health behavior change. *Western Journal of Nursing Research, 25*(2), 134-152.

Lindgren, K. P., Neighbors, C., Gasser, M. L., Ramirez, J. J., & Cvencek, D. (2016). A review of implicit and explicit substance self-concept as a predictor of alcohol and tobacco use and misuse. *The American Journal of Drug and Alcohol Abuse*, 1-10.

Luck, K., & Beagan, B. (2015). Occupational transition of smoking cessation in women: "You're restructuring your whole life". *Journal of Occupational Science, 22*(2), 183-196.

Markus, H. & Nurius, P. (1986). Possible selves. *American Psychologist, 41*,954-969.

McAdams, D. P., & McLean, K. C. (2013). Narrative identity. *Current Directions in Psychological Science, 22*(3), 233-238.

Meijer E., Gebhardt W. A., Dijkstra A., Willemsen M. C. & Van Laar C. (2015). Quitting smoking: The importance of non-smoker identity in predicting smoking behavior and responses to a smoking ban, *Psychology & Health,* 30(12), 1387-1409.

Meijer, E. Gebhardt, W. A., Van Laar, C., Kawous, R., & Beijk, S. C. A. M. (2016). Socio-economic status in relation to smoking: The role of (expected and desired) social support and quitter identity. *Social Science & Medicine, 162,* 41-49.

Meijer, E., Van den Putte, B., Gebhardt, W. A., Van Laar, C., Bakk, Z., Dijkstra, A., … & Willemsen, M. C. (2017). A longitudinal study into the reciprocal effects of identities and smoking behavior: Findings from the ITC Netherlands Survey. *Manuscript submitted for publication*.

Moan, I. S. & Rise, J. (2005). Quitting smoking: Applying an extended version of the theory of planned behavior to predict intention and behavior. *Journal of Applied Biobehavioral Research, 10*(1), 39-68.

Moan, I. S. & Rise, J. (2006). Predicting smoking reduction among adolescents using an extended version of the theory of planned behavior. *Psychology and Health, 21*(6), 717-738.

Na, J., Chan, M. Y., Lodi-Smith, J., & Park, D. C. (2016). Social-class differences in self-concept clarity and their implications for well-being. *Journal of Health Psychology*, online first.

Nachtigal, A., & Kidron, C. A. (2015). Existential multiplicity and the late-modern smoker: negotiating multiple identities in a support group for smoking cessation. *Sociology of Health & Illness*, *37*(3), 452-467.

Nagelhout, G. E., Heijndijk, S. M., Cummings, K. M., Willemsen, M. C., Van den Putte, B., Heckman, B. W., … & Borland, R. (2016). E-cigarette advertisements, and associations with the use of e-cigarettes and disapproval or quitting of smoking: Findings from the International Tobacco Control (ITC) Netherlands Survey. *International Journal of Drug Policy, 29,* 73-79.

Nagelhout, G. E., Willemsen, M. C., Thompson, M. E., Fong, G. T., Van den Putte, B., & De Vries, H. (2010). Is web interviewing a good alternative to telephone interviewing? Findings from the International Tobacco Control (ITC) Netherlands Survey. *BMC Public Health*, *10*(1), 1-10.

Parry, O., Fowkes, F. G. R. & Thomson, C. (2001). Accounts of quitting among older ex-smokers with smoking-related disease. *Journal of Health Psychology, 6,* 481-493.

Pennebaker, J. W. (2004). Theories, therapies, and taxpayers: On the complexities of the expressive writing paradigm. *Clinical Psychology: Science and Practice, 11*, 138-142.

Pennebaker, J. W. (2010). Expressive writing in a clinical setting. *The Independent Practitioner, 30*, 23-25.

Pisinger, C., Aadahl, M., Toft, U., & Jørgensen, T. (2011). Motives to quit smoking and reasons to relapse differ by socioeconomic status. *Preventive Medicine, 52,* 48-52.

R Core Team (2014). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL http://www.R-project.org/.

Reid, J.L., Hammond, D., Boudreau, C., Fong, G.T., & Siahpush, M. (2010). Socioeconomic disparities in quit intentions, quit attempts and smoking abstinence among smokers in four western countries: Findings from the international tobacco control four country survey. *Nicotine & Tobacco Research,* 12 (S1): S20-33.

Rise, J., Sheeran, P., & Hukkelberg, S. (2010). The role of self-identity in the Theory of Planned Behavior: A meta-analysis. *Journal of Applied Social Psychology, 40*(5), 1085-1105.

Rosseel, Y. (2012). lavaan: An R Package for Structural Equation Modeling. *Journal of Statistical Software, 48*(2), 1-36.

Schaap, M. M., & Kunst, A. E., (2009). Monitoring of socio-economic inequalities in smoking: Learning from the experiences of recent scientific studies. *Public Health, 123,* 103-109.

Schaap, M. M., van Agt, H. M., & Kunst, A. E. (2008). Identification of socioeconomic groups at increased risk for smoking in European countries: looking beyond educational level. *Nicotine & Tobacco Research*, *10*(2), 359-369.

Scholz, U., Stadler, G., Ochsner, S., Rackow, P., Hornung, R., & Knoll, N. (2016). Examining the relationship between daily changes in support and smoking around a self-set quit date. *Health Psychology*, *35*(5), 514-517.

Shadel, W. G., Mermelstein, R., & Borrelli, B. (1996). Self-concept changes over time in cognitive-behavioral treatment for smoking cessation. *Addictive Behaviors, 21*(5), 659-663.

Song, H., Kim, J., Kwon, R. J., & Jung, Y. (2013). Anti-smoking educational game using avatars as visualized possible selves. *Computers in Human Behavior*, *29*(5), 2029-2036.

Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin, W. G. & Worchel, S. (Eds.), *The social psychology of intergroup relations*. Monterey: Brooks/Cole Publishing Company.

Tajfel, H., & Turner, J. C. (1986). The social identity theory of intergroup behavior. In Worchel, S. & Austin, W. G. (Eds.), *The psychology of intergroup relations* (pp. 7–24). Chicago: Nelson-Hall.

Tombor, I., Shahab, L., Brown, J., & West, R. (2013). Positive smoker identity as a barrier to quitting smoking: Findings from a national survey of smokers in England. *Drug and Alcohol Dependence, 133*, 740-745.

Tombor, I., Shahab, L., Brown, J., Notley, C., & West, R. (2015). Does non-smoker identity following quitting predict long-term abstinence? Evidence from a population survey in England. *Addictive Behaviors*, *45*, 99-103.

Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). Rediscovering the social group: A self-categorization Theory. Oxford: Basil Blackwell.

Van den Putte, B., Yzer, M., Willemsen, M. C., & De Bruijn, G. (2009). The effects of smoking self-identity and quitting self-identity on attempts to quit smoking. *Health Psychology, 28*(5), 535-544.

Vangeli, E., Stapleton, J., & West, R. (2010). Residual attraction to smoking and smoker identity following smoking cessation. *Nicotine & Tobacco Research*, *12*(8), 865-869.

Vangeli, E., & West, R. (2012). Transition towards a 'non-smoker' identity following smoking cessation: An interpretative phenomenological analysis. *British Journal of Health Psychology, 17,* 171-184.

West, R. (2006). Theory of addiction. Oxford: Blackwell, Addiction Press.

Wetter, D. W., Cofta-Gunn, L., Irvin, J. E., Fouladi, R. T., Wright, K., Daza, P. … Gritz, E. R. (2005). What accounts for the association of education and smoking cessation? *Preventive Medicine, 40,* 452-460.

Wheeler, S. C., DeMarree, K. G., & Petty, R. E. (2007). Understanding the role of the self in prime-to-behavior effects: The active-self account. *Personality and Social Psychology Review*, *11*(3), 234-261.

APPENDIX TABLE 1. PARTICIPANT FLOW ACROSS WAVES.

	Replenishment						
	Wave 1	*Wave 2*	*Wave 3*	*Wave 4*	*Wave 5*	*Wave 6*	*Total*
Wave 1	2012 (1763)						2012 (1763)
Wave 2	1382 (1140), 69%	579 (502)					2060 (1723)
Wave 3	1052 (839), 52%	454 (369), 78%	482 (377)				2101 (1672)
Wave 4	870 (658), 43%	402 (318), 69%	371 (276), 77%	286 (282)			2022 (1604)
Wave 5	732 (525), 36%	346 (261), 59%	300 (209), 62%	224 (198), 78%	293 (285)		1970 (1531)
Wave 6	612 (411), 30%	294 (212), 51%	241 (167), 50%	180 (149), 63%	217 (194), 74%	404 (393)	2008 (1569)

Note. Numbers of smokers are indicated between brackets. Percentages indicate how many of the participants included in a wave stayed in the study over time. Participants could continue their participation if they had not participated in a previous wave.

APPENDIX TABLE 2A. DIFFERENCES BETWEEN 'DROP-OUTS' AND 'RESPONDERS' IN BACKGROUND VARIABLES (MAIN SAMPLE): CHI-SQUARE TEST AND ONE-WAY ANOVAS.

		Drop-outs (n=580-633)	*Responders (n=1275-1389)*	
Characteristic (wave 4)		***Frequency (Expected count)***		***χ^2 statistic***
Gender[a]	Female	285 (307)	694 (673)	$\chi^2(1) = 4.25$, $p = .04$
	Male	348 (327)	695 (717)	
SES	Low	184 (181)	395 (398)	$\chi^2(2) = .38$, $p = .83$
	Middle	286 (283)	617 (620)	
	High	157 (163)	362 (356)	
Smoking status	Smoker	510 (502)	1094 (1102)	$\chi^2(1) = .87$, $p = .35$
	Ex-smoker	123 (131)	295 (287)	
		M (SD)		***t statistic***
Age		38.80 (15.14)	43.67 (16.14)	$t(1298.27) = -6.57$, $p < .001$, $d = .31$
Cigarettes per day		11.29 (9.48)	11.26 (9.40)	$t(1984) = .07$, $p = .95$, $d = .00$
Smoker self-identity		2.83 (1.04)	2.73 (1.06)	$t(1897) = 1.93$, $p = .054$, $d = .10$
Quitter self-identity		3.14 (1.12)	3.17 (1.12)	$t(1853) = -.53$, $p = .60$, $d = .03$

Note. 'Responders' were defined as those who completed waves 4-6, and 'drop-outs' were those who completed wave 4 but did not complete wave 5 and/or 6. Responders were more likely to be female and were older than drop-outs.

APPENDIX TABLE 2B. DIFFERENCES BETWEEN 'DROP-OUTS' AND 'RESPONDERS' IN BACKGROUND VARIABLES (CROSS VALIDATION SAMPLE): CHI-SQUARE TEST AND ONE-WAY ANOVAS.

		Drop-outs (n=523-908)	*Responders (n=964-1104)*	
Characteristic (wave 1)		***Frequency (Expected count)***		***χ^2 statistic***
Gender[a]	Female	389 (425)	553 (517)	$\chi^2(1) = 10.52$, $p < .001$
	Male	519 (483)	551 (587)	
SES	Low	240 (286)***	395 (349)***	$\chi^2(1) = 20.66$, $p < .001$
	Middle	407 (384)**	444 (467)**	
	High	247 (224)**	249 (272)**	
Smoking status	Smoker	785 (796)	978 (967)	$\chi^2(1) = 2.09$, $p = .15$
	Ex-smoker	123 (112)	126 (137)	
		M (SD)		***t statistic***
Age		38.18 (15.91)	39.15 (15.30)	$t(2010) = -1.40$, $p = .16$, $d = .06$
Cigarettes per day		14.00 (8.09)	14.97 (8.24)	$t(1736) = -2.45$, $p = .01$, $d = .12$
Smoker self-identity		2.97 (.94)	2.99 (.98)	$t(1632) = -.56$, $p = .58$, $d = .02$
Quitter self-identity		3.01 (.99)	2.94 (1.05)	$t(1573) = 1.41$, $p = .16$, $d = .07$

* $p < .05$; ** $p < .01$; *** $p < .001$ (deviations from expected cell counts).

Note. 'Responders' were defined as those who completed waves 1-3, and 'drop-outs' were those who completed wave 1 but did not complete wave 2 and/or 3. Responders were more likely to be female, to have lower SES, and to smoke more cigarettes per day than drop-outs.

a. Although χ^2 was significant, no significant differences were found between counts and expected counts.

APPENDIX TABLE 3. BACKGROUND AND SMOKING CHARACTERISTICS FOR THE CROSS-VALIDATION AND INITIAL SAMPLES.

Characteristic		Cross-validation sample		Initial sample	
Entire sample		***Frequency (%)***	***M (SD)***	***Frequency (%)***	***M (SD)***
SES	Lower	318 (35%)		331 (28%)	
	Middle	378 (41%)		530 (45%)	
	Higher	219 (24%)		329 (28%)	
Gender	Male	461 (50%)		599 (50%)	
	Female	461 (50%)		595 (50%)	
Age			39.32 (15.28)		43.70 (16.03)
Smokers					
Cigarettes per day[1;4]		15.68 (8.39)		15.02 (8.43)	
Quit attempt[1-2;4-5]	Yes	166 (26%)		183 (25%)	
	No	485 (75%)		559 (75%)	
(If quit attempt) # Quit attempts[1-2;4-5]			2.05 (1.93)		1.35 (.63)
(If quit attempt) Days smoking since quit attempt[2;5]			119.46 (94.58)		100.87 (95.15)
Quit attempt[2-3;5-6]	Yes	165 (25%)		206 (28%)	
	No	486 (75%)		536 (72%)	
(If quit attempt) # Quit attempts[2-3;5-6]			1.40 (.73)		1.54 (1.97)
(If quit attempt) Days smoking since quit attempt[3;6]			110.92 (153.46)		106.33 (86.02)
Ex-smokers					
Relapse[1-2;4-5]	Yes	43 (61%)		14 (7%)	
	No	27 (39%)		187 (93%)	
(If relapse) Days abstinent since relapse[2;5]			189.46 (112.49)		157.64 (98.22)
Occasional cigarette (less than monthly)[2;4]	Yes	6 (9%)		9 (5%)	
	No	64 (91%)		192 (96%)	
Relapse[2-3;5-6]	Yes	56 (80%)		6 (3%)	
	No	14 (20%)		195 (97%)	
(If relapse) Days abstinent since relapse[3;6]			266.00 (87.03)		173.07 (93.88)
Occasional cigarette (less than monthly)[3;6]	Yes	2 (3%)		1 (1%)	
	No	68 (97%)		200 (100%)	

Note. Superscripts indicate waves, for example 1;4 means at waves 1 (cross-validation sample) and 4 (initial sample), respectively, and 1-2;4-5 means between waves 1 and (cross-validation sample) and 4 and 5 (initial sample), respectively.

APPENDIX TABLE 4. DESCRIPTIVE STATISTICS OF COVARIATES INCLUDED IN SMOKER AND QUITTER SELF-IDENTITY MODELS (WAVES 4-6).

		M (SD)				# missing values			
		Smoker self-identity model		*Quitter self-identity model*		*Smoker self-identity model*		*Quitter self-identity model*	
Covariate		Smokers	Ex-smokers	Smokers	Ex-smokers	Smokers	Ex-smokers	Smokers	Ex-smokers
Negative attitude smoking		3.03 (.71)	3.54 (.77)	3.02 (.71)	3.54 (.75)	8	0	8	0
Negative attitude quitting		1.98 (.81)	1.25 (.54)	1.99 (.82)	1.26 (.55)	22	0	18	0
Perceived health damage		1.75 (.72)	2.02 (.76)	1.74 (.72)	2.00 (.76)	131	38	103	38
Perceived pro-smoking norms		2.56 (1.04)	2.10 (.95)	2.56 (1.04)	2.11 (.96)	24	8	17	7
Perceived pro-quitting norms		4.21 (.80)	4.58 (.81)	4.20 (.80)	4.58 (.81)	19	4	12	6
Stigma own		3.40 (.91)	3.91 (.92)	3.39 (.87)	3.93 (.95)	0	0	0	0
Stigma perceived		4.51 (1.03)	4.44 (.86)	4.50 (1.01)	4.46 (.86)	0	0	0	0
Acceptance own		2.93 (.67)	2.49 (.69)	2.92 (.67)	2.50 (.71)	22	7	17	7
Acceptance perceived		2.42 (.61)	2.50 (.62)	2.42 (.60)	2.50 (.61)	25	1	19	2
Self-evaluative emotions*		3.13 (1.03)		3.14 (1.03)		8		7	
Self-evaluative emotions outside*		3.24 (.70)		3.26 (.68)		53		44	
Health worries*		2.03 (.70)		2.03 (.70)		50		38	
Expected social support*		1.89 (.87)		1.90 (.87)		33		29	
Cigarettes per day*		15.02 (8.43)		14.97 (8.36)		10		8	
		Frequency (%)				**# missing values**			
		Smoker self-identity model		*Quitter self-identity model*		*Smoker self-identity model*		*Quitter self-identity model*	
	Categories	Smokers	Ex-smokers	Smokers	Ex-smokers	Smokers	Ex-smokers	Smokers	Ex-smokers
SES	Low	238 (32%)	44 (22%)	203 (30%)	41 (21%)	2	1	3	2
	Middle	342 (46%)	76 (38%)	321 (48%)	70 (36%)				
	High	160 (22%)	80 (40%)	147 (22%)	82 (42%)				

Note. * Additional covariate for smokers-only models, not included in multiple-group analyses. Smoker subsamples: $n = 742$ and $n = 674$ for smoker and quitter self-identity, respectively. Ex-smoker subsamples: $n = 201$ and $n = 195$ for smoker and quitter self-identity, respectively.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Smoker self-identity w6	1														
2. Smoker self-identity w7	.61**	1													
3. Smoker self-identity w8	.54**	.60**	1												
4. Quitter self-identity w6	-.62**	-.49**	-.45**	1											
5. Quitter self-identity w7	-.51**	-.57**	-.49**	.59**	1										
6. Quitter self-identity w8	-.49**	-.52**	-.68**	.53**	.59**	1									
7. SES (middle vs. low)	-.01	-.04	.01	-.04	-.03	-.03	1								
8. SES (high vs. low)	-.15**	-.12**	-.19**	.12**	.14**	.19**	-.35**	1							
9. Negative attitude smoking	-.48**	-.39**	-.40**	.41**	.38**	.35**	-.04	.14**	1						
10. Negative attitude quitting	.44**	.38**	.31**	-.43**	-.38**	-.36**	.07	-.09*	-.42**	1					
11. Self-evaluative emotions	.53**	.40**	.37**	-.59**	-.43**	-.43**	.07†	-.08*	-.48**	.53**	1				
12. Self-evaluative emotions outside	.50**	.42**	.44**	-.50**	-.38**	-.42**	.08†	-.10*	-.49**	.43**	.67**	1			
13. Perceived health damage	-.27**	-.22**	-.18**	.28**	.23**	.21**	-.02	.10*	.24**	-.28**	-.31**	-.31**	1		
14. Health worries	-.46**	-.38**	-.35**	.46**	.41**	.37**	.01	.13**	.39**	-.43**	-.51**	-.47**	.57**	1	
15. Perceived pro-smoking norms	.28**	.22**	.23**	-.28**	-.27**	-.26**	-.01	-.04	-.30**	.45**	.37**	.36**	-.24**	-.30**	1
16. Perceived pro-quitting norms	-.25**	-.22**	-.19**	.22**	.21**	.24**	-.01	.03	.25**	-.55**	-.27**	-.28**	.13**	.24**	-.52**
17. Expected social support	.04	.02	-.03	-.03	.01	-.01	.03	.11**	.02	.06	.07†	.02	.02	.01	.24**
18. Stigma own	-.29**	-.20**	-.18**	.25**	.17**	.16**	-.01	.09*	.30**	-.15**	-.33**	-.35**	.17**	.26**	-.20**
19. Stigma perceived	-.14**	-.12**	-.14**	.11**	.14**	.14**	.02	.05	.22**	-.21**	-.22**	-.24**	.09*	.19**	-.19**
20. Acceptance own	.30**	.19**	.22**	-.27**	-.24**	-.22**	.06	-.09*	-.30**	.22**	.29**	.38**	-.02	-.17**	.28**
21. Acceptance perceived	.15**	.10*	.17**	-.12**	-.12**	-.17**	.05	-.03	-.22**	.21**	.19**	.26**	-.11**	-.12**	.19**
22. Cigarettes per day	.14**	.09*	.16**	-.12**	-.11**	-.12**	.02	-.12**	-.07†	-.04	-.04	.06	.13**	.01	.09*

$^{\dagger} p < .10$, * $p < .05$, ** $p < .01$.

APPENDIX TABLE 5. MEANS AND (CO)VARIANCES OF LATENT INTERCEPTS AND SLOPES FOR FINAL MODELS WITH COVARIATES.

			b(SE)				
Model	**Identity construct**	**Subsample**	***Mean intercept***	***Intercept variance***	***Mean slope***	***Slope variance***	***Covariance intercept/ slope***
Model 1	Smoker identity	Smokers	2.65 (.21)***	.27 (.02)**	-.10 (.14)	.06 (.02)**	-.05 (.02)*
Model 2	Quitter identity	Smokers	3.14 (.23)***	.26 (.05)***	.12 (.15)	.07 (.03)**	-.03 (.03)
Model 3	Smoker identity	Smokers	3.38 (.14)***	.32 (.04)***	.28 (.08)**	.06 (.02)**	-.05 (.02)$^{+}$
		Ex-smokers	1.96 (.18)***	.32 (.04)***	.13 (.10)	.11 (.03)***	-.14 (.03)***
Model 4	Quitter identity	Smokers	2.84 (.05)***	.34 (.04)***	-.07 (.03)*	.06 (.02)**	-.03 (.02)
		Ex-smokers	4.04 (.07)***	.11 (.04)**	-.07 (.03)*	.06 (.02)**	-.03 (.02)

Note. Mean latent intercept and slope and their (co)variances are adjusted for covariates
$^{+}p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

	16	17	18	19	20	21
1. Smoker self-identity w6						
2. Smoker self-identity w7						
3. Smoker self-identity w8						
4. Quitter self-identity w6						
5. Quitter self-identity w7						
6. Quitter self-identity w8						
7. SES (middle vs. low)						
8. SES (high vs. low)						
9. Negative attitude smoking						
10. Negative attitude quitting						
11. Self-evaluative emotions						
12. Self-evaluative emotions outside						
13. Perceived health damage						
14. Health worries						
15. Perceived pro-smoking norms						
16. Perceived pro-quitting norms	1					
17. Expected social support	-.24**	1				
18. Stigma own	.09*	-.02	1			
19. Stigma perceived	.24**	.00	.34**	1		
20. Acceptance own	-.17**	.07^{+}	-.24**	-.10*	1	
21. Acceptance perceived	-.24**	.06	-.10**	-.27**	.49**	
22. Cigarettes per day	-.01	.02	-.09*	.00	.32**	.04

$^{+}p < .10$, * $p < .05$, ** $p < .01$.

APPENDIX TABLE 6A. SPEARMAN CORRELATIONS BETWEEN IDENTITY VARIABLES AND COVARIATES INCLUDED IN SMOKER AND QUITTER SELF-IDENTITY MODELS (WAVES 4-6): SMOKER SUBSAMPLE (N = 528 - 655).

APPENDIX TABLE 6A. SPEARMAN CORRELATIONS BETWEEN IDENTITY VARIABLES AND COVARIATES INCLUDED IN SMOKER AND QUITTER SELF-IDENTITY MODELS (WAVES 4-6): SMOKER SUBSAMPLE (N = 528 - 655) (CONT.).

APPENDIX TABLE 6B. SPEARMAN CORRELATIONS BETWEEN IDENTITY VARIABLES AND COVARIATES INCLUDED IN SMOKER AND QUITTER SELF-IDENTITY MODELS (WAVES 4-6): EX-SMOKER SUBSAMPLE (N = 148 - 186).

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Smoker self-identity w6	1															
2. Smoker self-identity w7	.44**	1														
3. Smoker self-identity w8	.27**	.38**	1													
4. Quitter self-identity w6	-.69**	-.39**	-.27**	1												
5. Quitter self-identity w7	-.41**	-.59**	-.40**	.44**	1											
6. Quitter self-identity w8	-.18*	-.32**	-.53**	.22**	.44**	1										
7. SES (middle vs. low)	-.05	-.06	-.07	.07	.09	.01	1									
8. SES (high vs. low)	.03	.05	.01	.02	.02	.04	-.53**	1								
9. Negative attitude smoking	-.25**	-.12^{+}	-.18*	.27**	.10	.17*	-.03	.16*	1							
10. Negative attitude quitting	.37**	.33**	.27**	-.46**	-.37**	-.20**	-.05	.08	-.18*	1						
11. Perceived health damage	.22**	.05	-.01	-.15^{+}	-.09	-.03	.08	-.27**	-.12	.00	1					
12. Perceived pro-smoking norms	-.13	-.05	-.16*	.22**	.06	.18*	.01	.01	-.31**	.26**	.05	1				
13. Perceived pro-quitting norms	-.13^{+}	-.26**	-.27**	.18*	.23**	.29**	-.01	-.11	.13^{+}	-.38**	.00	-.26**	1			
14. Stigma own	-.17*	-.14^{+}	-.18*	.13	.14^{+}	.16*	-.17*	.29**	.44**	-.16*	-.08	-.14^{+}	.07	1		
15. Stigma perceived	-.08	-.12	-.08	.11	.13^{+}	.06	-.07	.07	.14^{+}	.04	-.08	.04	.04	.44**	1	
16. Acceptance own	.14^{+}	.15*	.18*	-.17*	-.18*	-.20**	.05	-.09	-.47**	.18*	.06	.20**	-.06	-.38**	.00	1
17. Acceptance perceived	-.03	.02	.11	.01	-.01	-.15*	-.06	.06	-.19**	.01	.06	.03	-.03	-.12^{+}	-.24**	.37**

$^{+}$ $p < .10$, * $p < .05$, ** $p < .01$.

APPENDIX TABLE 7A. FIT OF LATENT GROWTH CURVE MODELS WITHOUT COVARIATES FOR SMOKER SELF-IDENTITY (MODEL 3): MULTIPLE-GROUP ANALYSES ON SMOKERS (N = 742) AND EX-SMOKERS (N = 201).

		Fit Measures						χ^2-difference test	
Model	Description	df	χ^2	CFI	RMSEA	SRMR	AIC	Model comparison	χ^2 statistic
MG0	No between-group equality restrictions	2	7.17*	.990	.074	.018	6389.42		
MG1	MG0 + equal intercept variances	3	8.10*	.990	.060	.037	6391.57	M1 vs. M0	$\chi^2(1) = 1.91$, $p = .17$
MG2	MG1 + equal slope variances	4	23.68***	.962	.102	.076	6408.49	M2 vs. M1	$\chi^2(1) = 19.72$, $p < .001$
MG3	MG1 + equal latent covariances	4	44.35***	.922	.146	.143	6435.73	M3 vs. M1	$\chi^2(1) = 43.82$, $p < .001$
MG4	MG1 + equal residual variances	6	14.29*	.984	.054	.064	6395.47	M4 vs. M1	$\chi^2(3) = 6.31$, $p = .098$
MG5	MG1 + equal mean intercepts	4	250.11***	.526	.361	.357	6789.70	M5 vs. M1	$\chi^2(1) = 162.23$, $p < .001$
MG6	MG1 + equal mean slopes	4	14.98**	.979	.076	.043	6398.20	M6 vs. M1	$\chi^2(1) = 7.46$, $p < .01$

* $p < .05$, ** $p < .01$, *** $p < .001$

APPENDIX TABLE 7B. FIT OF LATENT GROWTH CURVE MODELS WITH COVARIATES FOR SMOKER SELF-IDENTITY (MODEL 3): MULTIPLE-GROUP ANALYSES ON SMOKERS (N = 742) AND EX-SMOKERS (N = 201).

		Fit Measures						χ2-difference test	
Model	Description	df	χ^2	CFI	RMSEA	SRMR	AIC	Model comparison	χ^2 statistic
MGC0	No between-group equality restrictions	25	27.06	.998	.013	.011	25601.74		
MGC1	MGC0 + all regression weights equal	47	103.14***	.952	.050	.035	25637.66	MC1 vs. MC0	$\chi^2(22) = 77.55$, $p < .001$
MGC2	MGC0 + all regression weights intercepts equal	36	78.54***	.963	.050	.027	25632.36	MC2 vs. MC 0	$\chi^2(11) = 55.37$, $p < .001$
MGC3	MGC0 + all regression weights slopes equal	36	51.98*	.986	.031	.015	25604.39	MC3 vs. MC 0	$\chi^2(11) = 26.38$, $p < .01$
MGC4	MGC0 + specific regression weights intercepts/slopes equal (final model)	35	37.98	.997	.013	.014	25592.66	MC4 vs. MC 0	$\chi^2(10) = 10.93$ $p = .36$

* $p < .05$, *** $p < .001$

APPENDIX TABLE 8A. FIT OF LATENT GROWTH CURVE MODELS WITHOUT COVARIATES FOR QUITTER SELF-IDENTITY (MODEL 4): MULTIPLE-GROUP ANALYSES ON SMOKERS (N = 674) AND EX-SMOKERS (N = 195).

		Fit Measures						χ^2-difference test	
Model	Description	df	χ^2	CFI	RMSEA	SRMR	AIC	Model comparison	χ^2 statistic
MG0	No between-group equality restrictions	2	2.38	.999	.021	.009	6253.62		
MG1	MG0 + equal intercept variances	3	9.20*	.986	.069	.043	6259.03	M1 vs. M0	$\chi^2(1) = 5.81$, $p = .02$
MG2	MG0 + equal slope variances	3	4.35	.997	.032	.016	6253.56	M2 vs. M0	$\chi^2(1) = 1.94$, $p = .16$
MG3	MG2 + equal latent covariances	4	4.09	1.00	.007	.016	6251.57	M3 vs. M2	$\chi^2(1) = .01$, $p = .92$
MG4	MG3 + equal residual variances	7	4.90	1.00	.000	.020	6249.16	M4 vs. M3	$\chi^2(3) = 1.54$, $p = .67$
MG5	MG4 + equal mean intercepts	8	249.09***	.460	.263	.682	6670.58	M5 vs. M4	$\chi^2(1) = 152.81$, $p < .001$
MG6	MG4 + equal mean slopes	8	5.58	1.00	.000	.021	6247.95	M6 vs. M4	$\chi^2(1) = .67$, $p = .41$

* $p < .05$, *** $p < .001$

APPENDIX TABLE 8B. FIT OF LATENT GROWTH CURVE MODELS WITH COVARIATES FOR QUITTER SELF-IDENTITY (MODEL 4): MULTIPLE-GROUP ANALYSES ON SMOKERS (N = 674) AND EX-SMOKERS (N = 195).

		Fit Measures						χ^2-difference test	
Model	Description	df	χ^2	CFI	RMSEA	SRMR	AIC	Model comparison	χ^2 statistic
MGC0	No between-group equality restrictions	30	20.31	1.00	.000	.008	23965.87		
MGC1	MGC0 + all regression weights equal	52	79.12**	.973	.035	.028	23987.46	MC1 vs. MC0	$\chi^2(22) = 60.80$, $p < .001$
MGC2	MGC0 + all regression weights intercepts equal	41	59.51*	.981	.032	.022	23986.41	MC2 vs. MC0	$\chi^2(11) = 43.79$, $p < .001$
MGC3	MGC0 + all regression weights slopes equal	41	38.24	1.00	.000	.013	23964.18	MC3 vs. MC0	$\chi^2(11) = 18.30$, $p = .07$
MGC4	MGC0 + specific regression weights intercepts/slopes equal (final model)	43	32.78	1.00	.000	.012	23953.68	MC4 vs. MC0	$\chi^2(13) = 12.63$, $p = .48$

* $p < .05$, ** $p < .01$

CHAPTER 8

DISCUSSION

This dissertation started with quotes from two smokers, Esther and Louis, who smoked a similar number of cigarettes per day but had very different self-conceptualizations in relation to smoking. Whereas Louis perceived himself as 'a real smoker', Esther experienced conflict between her smoking behavior and who she perceived herself to be as a person. The six studies presented in this dissertation focused on such identities in relation to smoking and quitting, and examined 1) how different identities that are relevant to smoking affect smoking behavior, 2) how identity changes over time, and 3) whether associations between identity and smoking-related outcomes, as well as identity change processes, differ between people with lower and higher socio-economic status (SES).

A multi-method approach was used to answer the research questions, offering a comprehensive analysis of identity and identity change. Chapter 2 presented a longitudinal survey with a one-year follow-up, examining how smoker and nonsmoker self- and group-identities as well as socio-economic status (SES) predict intention to quit, quit attempts and responses to the Dutch smoking ban in hospitality venues (from now on referred to as "Ch2. Identity smoking longitudinal"). Chapter 3 showed the results of a cross-sectional study which investigated how SES influences smoking behavior, addressing both social support and identity factors (referred to as "Ch3. SES identity cross-sectional"). This was followed by an experimental study presented in Chapter 4 which aimed to strengthen quitter self-identity through a writing exercise (referred to as "Ch4. Quitter self-identity experimental"). Chapter 5 described the in-depth findings of a longitudinal qualitative study on identity change in the process of quitting smoking (referred to as "Ch5. Identity change longitudinal qualitative"). Furthermore, the large-scale longitudinal study presented in Chapter 6 examined reciprocal relations between identity, intention to quit and smoking behavior among smokers and ex-smokers (referred to as "Ch6. Identity smoking large-scale longitudinal"). Finally, Chapter 7 examined identity changes over time among smokers and ex-smokers, and whether these changes can be predicted by SES and psychosocial factors, within the same large-scale longitudinal study (referred to as "Ch7. Identity change large-scale longitudinal"). The results of these six studies are summarized below, and theoretical and practical implications, as well as limitations are discussed (see also Figure 1).

Research Question 1: How do different identities that are relevant to smoking affect smoking behavior?

Smokers may identify more or less strongly with smoking, quitting or nonsmoking as behaviors (i.e., self-identity), and with the groups of smokers, quitters and nonsmokers (i.e., group-identity). Up until now, the relative importance of these different identities for smoking behavior was unknown, as these had not been examined jointly before. One of the main aims of this dissertation was therefore to investigate how different identities relevant to smoking affect smoking behavior.

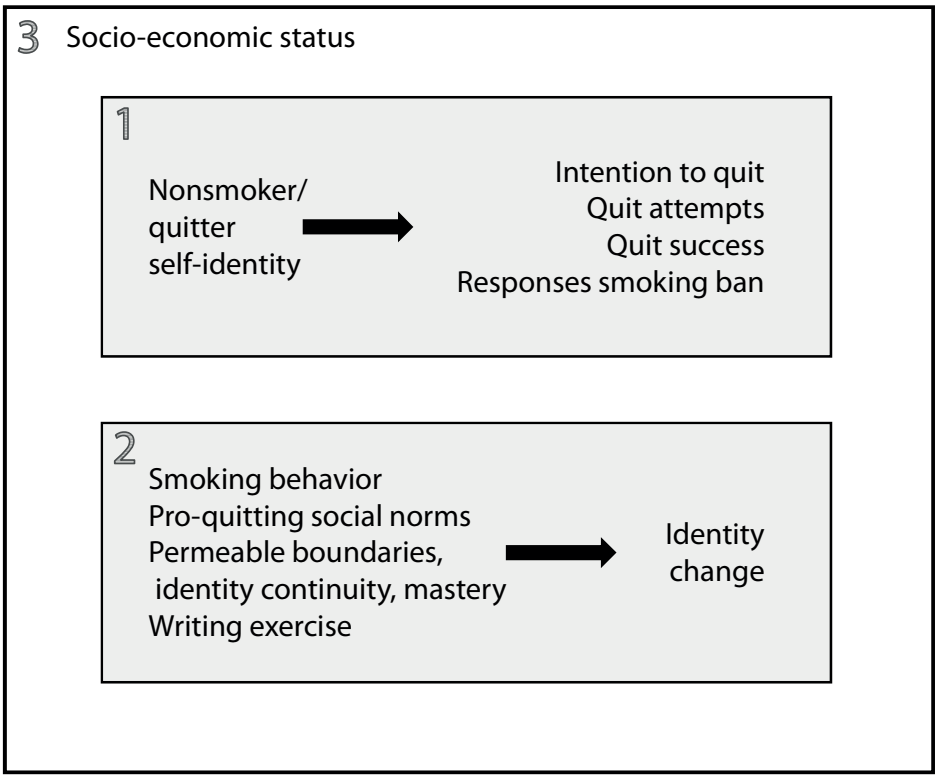


Figure 1. Overview of the answers to the research questions that were examined in this dissertation.

Identity is important for smoking and quitting

The studies presented in this dissertation clearly showed that identity matters. Corresponding with the propositions of PRIME theory and previous research on smoking and identity, we found that smokers are motivated to behave in line with the way they perceive themselves (Brown, 1996; Gibbons & Eggleston, 1996; Hertel & Mermelstein, 2012; Høie, Moan, & Rise, 2010; Moan & Rise, 2005, 2006; Shadel, Mermelstein, & Borrelli, 1996; Tombor, Shahab, Brown, Notley, & West, 2015; Tombor, Shahab, Brown, & West, 2013; Van den Putte, Yzer, Willemsen, & de Bruijn, 2009; Vangeli & West, 2012; West, 2006). Identity predicted intentions to quit, quit attempts, quit success and responses to the Dutch smoking ban in hospitality venues, even when controlled for other important and more typically examined factors such as the age of onset of daily smoking, the number of years that people had been smoking and their nicotine dependence.

Nonsmoker and quitter identities are more important than smoker identities

The comprehensive evaluation of identities related to smoking in this dissertation shed new light on which identities are most relevant to (changing) smoking behavior. The

studies consistently showed that the identities as a nonsmoker and quitter are more important than identity as a smoker. This dissertation was the first research project that could disentangle the relative importance of these different identities, as not only smoker identities but also nonsmoker and quitter identities, and self-identities as well as group-identities were investigated.

Results of the quantitative studies showed that smokers who more strongly perceive themselves as nonsmokers have stronger intentions to quit (Ch2. Identity smoking longitudinal), are more likely to attempt to quit (Ch2), and respond more positively to the smoking ban in hospitality venues (Ch2; see Table 1). Furthermore, smokers who perceive themselves more strongly as quitters also have stronger intentions to quit smoking (Ch3. SES identity cross-sectional; Ch6. Identity smoking large-scale longitudinal), and are more likely to quit smoking successfully (Ch6). Identification with smoking only played a role in one study, which showed that smokers who perceive themselves less strongly as smokers have stronger intentions to quit smoking (Ch3). However, smoker self-identity was not associated with quit intentions in two other studies (Ch2 and Ch6), and did not predict behavioral outcomes (i.e., quit attempts and quit success; Ch2 and Ch6, respectively). With regard to group identity, we found that stronger identification with the group of nonsmokers is associated with stronger intentions to quit (Ch3), and

Table 1. Examination of associations between identity constructs and smoking-related variables (RQ1) and moderation by SES (RQ3) in the chapters in this dissertation.

	Smoking-related variables (RQ1)			**SES (RQ3)**	
Identity constructs	***Intention to quit***	***Smoking behavior***	***Responses to smoking ban in hospitality venues***	***Differences in identity strength***	***Moderation association identity and smoking-related variables***
Self-identity					
Nonsmoker	**2**, 3, 5	**2, 5**	**2**	**2**, 3	**2 (intention to quit)**, 3
Quitter	**3**, 5, **6**	5, **6**		3, 7	3, 6
Smoker	2, **3**, 5, 6	2, 5, 6	2	2, 3, **7**	2, 3, 6
Group-identity					
Nonsmoker	2, **3**, 5	2, 5	**2**	2,3	2, 3
Quitter	3, 5			3	3
Smoker	2, 3, 5, 6	2, 5, 6	2	**2**,3	2, 3, 6

Note. Numbers in the table refer to the chapters in this dissertation, with numbers in bold indicating that a significant association was found in that chapter. Chapter 2 = Identity smoking longitudinal; Chapter 3 = SES identity cross-sectional; Chapter 5 = Identity change longitudinal qualitative; Chapter 6 = Identity smoking large-scale longitudinal; Chapter 7 = Identity change longitudinal quantitative.
Given the deductive nature of the study presented Chapter 5 (interpretative phenomenological analysis), the analysis focused on a broader range of identity constructs than those mentioned here.

with stronger positive responses and weaker negative responses to the smoking ban in hospitality venues (Ch2). No effects of identification with the group of smokers emerged (Ch2, Ch3 and Ch6).

In line with these quantitative results showing the importance of nonsmoker and quitter identities, the qualitative study showed that smokers need to be able to picture themselves as nonsmokers in order to quit successfully (Ch5. Identity change longitudinal qualitative). All smokers who were included in this qualitative study intended to quit within two months (i.e., had a strong intention to quit), and most of them felt negative about being a smoker (i.e., had a weak smoker self-identity). However, only those participants who identified with nonsmoking, and increasingly perceived themselves as nonsmokers over time, reached stable abstinence. In sum, results consistently showed that nonsmoker and quitter identities are more relevant than smoker identities. Importantly, the experimental study (Ch4. Quitter self-identity experimental) showed that identification with quitting can be facilitated through a writing exercise, which will be discussed in more detail when the results relating to the second research question are described.

Self-identity is more important for smoking and quitting behavior than group-identity

Our results also seem to indicate that self-identity is more important for smoking and quitting than group-identity. Whereas nonsmoker and quitter self-identities were consistently associated with intentions to quit and behavioral outcomes (Ch2. Identity smoking longitudinal; Ch3. SES identity cross-sectional; Ch6. Identity smoking large-scale longitudinal), group-identification with nonsmokers was only associated with quit intentions in one study (Ch3), but this was not found in another study (Ch2). However, we found that both nonsmoker self-identity and group-identity were associated with responses to the smoking ban in hospitality venues. As such, self-identity may be more important than group-identities for an individual smoker's intentions to quit and quit attempts, whereas group-identities also play a role in responses to situations that are more socially embedded and can be perceived as threatening by group members, such as a smoking ban.

Take-home messages

In conclusion, the above studies together showed that identity is important for smoking behavior. In general, nonsmoker and quitter identities are more important for smoking and quitting behavior than smoker identities, and self-identities appeared to be more important than group-identities.

Research Question 2: How does identity change?

As outlined above, smokers need to be able to perceive themselves as quitters or nonsmokers in order for them to quit successfully. In other words, their identity needs to change. However, it is unclear how smokers come to perceive themselves more as quitters or nonsmokers. Similarly, the processes that allow ex-smokers to increasingly identify with nonsmoking over time are unknown.

Three longitudinal studies examined how identity may change spontaneously (Ch5. Identity change longitudinal qualitative; Ch6. Identity smoking large-scale longitudinal; Ch7. Identity change large-scale longitudinal), see also Table 2. The two large-scale longitudinal quantitative studies among smokers and ex-smokers showed that smoking behavior, social norms and SES affected identity change (Ch6 and Ch7; see RQ3 for findings regarding SES differences). These studies were complimented by an in-depth longitudinal qualitative study exploring the psychological processes that may enable identity change during the process of quitting smoking. In addition, an experimental study showed that quitter identity can be strengthened through a simple writing exercise (Ch4. Quitter self-identity experimental). The results of these studies are described in more detail below.

Table 2. Examination of change in identity constructs (RQ2) and moderation by SES (RQ3) in the chapters in this dissertation.

	Identity change (RQ2)			**SES (RQ3)**
Factors related to identity change	***Quitter self-identity***	***Smoker self-identity***	***Smoker group-identity***	***Moderation association factors[a] and identity change***
Smoking behavior	5, **6, 7**	5, **6, 7**	5, **7**	6
Intention to quit	**6**	**6**	**6**	6
SES	**7**	**7**		
Pro-quitting social norms	**7**	**7**		
Psychological processes (permeable identity boundaries, sense of identity continuity, sense of mastery of quitting)	**5**	**5**	**5**	
Intervention (writing exercise)	**4**			

Note. Numbers in the table refer to the chapters in this dissertation, with numbers in bold indicating that a significant association was found in that chapter. Chapter 4 = Quitter self-identity experimental; Chapter 5 = Identity change longitudinal qualitative; Chapter 6 = Identity smoking large-scale longitudinal; Chapter 7 = Identity change longitudinal quantitative.

Given the deductive nature of the study presented Chapter 5, the analysis focused on a broader range of identity constructs than those mentioned here, and statistical significance is not applicable for this methodology.

a. Factors mentioned under "Factors related to identity change".

Smoking behavior shapes identity

Smoking behavior impacts identity, such that 'who we are' is partially based on 'what we do'. Chapter 6 showed that quit success was associated with subsequent changes in identity. Quit success was a combined measure for smokers and ex-smokers, ranging from low on the scale (high frequency of smoking) to high (longer duration of abstinence). We found that more quit success was related to increased quitter self-identity and decreased smoker self- and group-identities one year later. Similarly, smokers who had stronger intentions to quit showed an increased identification with quitting, and decreased identification with smoking and smokers, one year later. In line with self-perception theory, these findings may suggest that behaviors are perceived by smokers and ex-smokers as indicative of their identity, such that 'I smoke, so I am a smoker' or 'I have not smoked for a long time, so I am a nonsmoker' (Bem, 1972; Tice, 1994). Correspondingly, continuing smokers come to perceive themselves more strongly as smokers over time, whereas identification with smoking decreases among ex-smokers who successfully stay abstinent (Ch7. Identity change large-scale longitudinal). Findings from the qualitative study also indicate that behavior may shape identity (Ch5. Identity change longitudinal qualitative). That is, several smokers said that they perceived themselves as smokers because they had been smoking for a long time.

Notably, although behavior is thus important for self-perception, identity is more than a mere reflection of past behavior. For example, identity encompasses an emotional evaluation of what it is like to be the person that an individual perceives himself to be (West, 2006). Correspondingly, studies in this dissertation (Ch2. Identity smoking longitudinal; Ch3. SES identity cross-sectional) and other work (Moan & Rise, 2005, 2006; Rise, Sheeran, & Hukkelberg, 2010; Van den Putte et al., 2009) show clear unique effects of identity on intentions to quit and quit attempts, above and beyond past smoking behavior.

Social norms shape identity

Results further showed that identity does not change in a social vacuum, but that identity is responsive to perceived social norms. Chapter 7 (Identity change longitudinal quantitative) showed that smokers and ex-smokers who perceive stronger pro-quitting social norms in their social environments increasingly perceive themselves as quitters over time. In addition, ex-smokers who perceive stronger pro-quitting social norms identify less strongly with smoking over time. These findings correspond with recent models on social identity change in the context of recovery from addiction, which underscore that pro-recovery social norms may facilitate identification with recovery (Best et al., 2015; Frings & Albery, 2015).

Identity change is facilitated by permeable identity boundaries, identity continuity and mastery

In addition, the longitudinal qualitative study offered an in-depth exploration of identity change in the process of quitting smoking (Ch5. Identity change longitudinal qualitative). Of the ten smokers who were included in this study, four quit successfully in the period during which the interviews took place. Moreover, two of these four participants showed an identity change toward a nonsmoker identity and reached successful abstinence, even after two years. In contrast, the other two did not show identity change and had relapsed at this follow-up measurement. This suggests that nonsmoking needs to become integrated into the self-concept in order for smoking behavior change to sustain over time.

Furthermore, identity change toward a nonsmoker identity was enabled by permeable identity boundaries, a sense of identity continuity and a sense of mastery of quitting. The absence of clear demarcated boundaries of identities in relation to smoking (e.g. smoking when 'not a smoker') allowed the two long-term quitters to navigate between their identities as smoker and nonsmoker. Instead, those who had less permeable and flexible representations of identity (e.g., the perception that a smoking history indicates a smoker identity) appeared to have more difficulty to come to see themselves as nonsmokers.

Identity change also appeared to be facilitated by a sense of identity continuity, such that the two long-term quitters perceived themselves as essentially staying the same person in the process of change. In contrast, the two participants who did not show identity change after quitting, and who relapsed, experienced a sense of loss of self without smoking (e.g., feeling 'not myself' or 'amputated' without smoking). Finally, identity change appeared to be facilitated by a sense of mastery of quitting in the two long-term quitters, such that they felt proud of the progress they had made and capable of quitting.

Writing exercises may facilitate identity change

In addition to these studies on spontaneous identity change, we investigated in Chapter 4 (Ch4. Quitter self-identity experimental) whether identification with quitting can be facilitated among daily smokers, using a minimal intervention. This experimental study provided some initial support for the use of writing exercises to strengthen quitter self-identity. That is, quitter self-identity appeared to be strengthened through a simple writing exercise, although the effect was small and marginally significant.

Analyses of the content of the written responses further showed that quitter self-identity was especially (and significantly) strengthened among smokers who linked quitting smoking to their lifestyle (e.g., quitting fits with an active lifestyle) or who wanted to quit for health reasons. In addition, smokers who wanted to become a quit-

ter because of the positive aspects of quitting showed an increase in quitter identity. Increased quitter identity was not found for those who wanted to become a quitter to avoid the negative aspects of smoking. The negative aspects of smoking are more likely to be related to a weaker identification with smoking than to a stronger identification with quitting. In other words, these negative aspects as a motivator may be less relevant for quitter identities.

In addition to the writing exercise for quitter self-identity, this study also examined whether expected social support for quitting could facilitate identification with quitting. Social support was manipulated through experimental vignettes. However, given that the social support manipulation was unsuccessful, we were unable to assess whether participants could identify with quitting more easily if they were led to expect stronger support for quitting. In sum, although the effects of the writing exercise were relatively small, this chapter showed that writing exercises are likely a promising method to help smokers to increase their identification with quitting.

Take-home messages

In conclusion, the above showed that for spontaneous changes in identity smoking and quitting behavior and social norms are important. On a finer-grained psychological level, identity change is facilitated by permeable identity boundaries, a sense of identity continuity, and a sense of mastery of quitting. Quitter self-identity appears to be changeable through writing exercises.

Research Question 3: Do associations between identity and smoking-related outcomes and identity change processes differ with socio-economic status?

Differences in smoking and quitting behavior between smokers with lower and higher SES are well known: smoking is more prevalent and persistent among those with lower SES backgrounds. Given this, it seems likely that identity processes are also moderated by SES, and that identity may be differently related to smoking-related outcomes in lower and higher SES groups. However, these questions had not been examined up until now. This dissertation therefore investigated SES as a moderator of identity and identity processes.

Lower SES smokers are heavier smokers

This dissertation showed that smoking behavior and social processes related to smoking differ with SES. That is, in line with previous research it was found that lower SES smokers smoke more cigarettes per day than higher SES smokers (Ch3. SES identity cross-sectional), and have stronger physical dependence on smoking (Ch2. Identity smoking longitudinal; Ch3) and weaker intentions to quit than middle and higher SES smokers (Ch2, not found in Ch3). Furthermore, lower SES smokers respond more negatively to

the smoking ban in hospitality venues than higher SES smokers (Ch2). In addition, lower SES smokers have fewer nonsmokers in their social networks than higher SES smokers. Lower SES also seemed -albeit marginally significant- to expect more negative social support (i.e., unsupportive behaviors such as complaining about smoking) from their social environment if they were to attempt to quit smoking. However, they have an equal desire to receive positive social support as higher SES smokers (i.e., supportive behaviors such as complimenting on being abstinent; Ch3). These findings are in line with previous work that showed that smoking is more prevalent, persistent and socially accepted in lower SES groups, that lower SES smokers are less likely to quit successfully, and that those who attempt to quit receive less social support for quitting (Bricard, Jusot, Beck, Khlat, & Legleye, 2016; Fernandez et al., 2006; Honjo, Tsutsumi, Kawachi, & Kawakami, 2006; Pisinger, Aadahl, Toft, & Jorgensen, 2011; Reid, Hammond, Boudreau, Fong, & Siahpush, 2010; Sorensen, Emmons, Stoddard, Linnan, & Avrunin, 2002; Wetter et al., 2005; Wiltshire, Bancroft, Parry, & Amos, 2003).

Lower SES smokers and ex-smokers hold identities that make quitting difficult

This dissertation was the first to show that identity strength differs with SES. Specifically, the large-scale study presented in Chapter 7 (Identity change longitudinal quantitative) showed that lower SES smokers identify more strongly with smoking than middle and higher SES smokers. Similarly, lower SES *ex-smokers* identify more strongly with smoking than middle SES ex-smokers. In line with this, Chapter 2 (Identity smoking longitudinal) showed that nonsmoker self-identity is stronger among those with higher SES. Smoker self-identity seemed to stronger among those with lower SES, but this was marginally significant. In contrast to the findings for nonsmoker and smoker self-identity, in Chapter 2 identification with the group of smokers was also stronger among those with higher SES. However, Chapter 3 (Ch3. SES identity cross-sectional) showed almost no differences in identity between SES groups. These contrasting findings could be related to the sample, which was less balanced in terms of SES (i.e., relatively fewer lower SES participants) than the samples used in Chapter 2 and 7. Overall, it seems that lower SES is associated with stronger smoker self-identities and weaker nonsmoker self-identities.

Moreover, Chapter 2 showed that the relation between nonsmoker self-identity and intention to quit is stronger among lower than higher SES smokers. In other words, whereas lower SES smokers in general have weaker intentions to quit than higher SES smokers, their intention to quit becomes much stronger when they identify more strongly with nonsmoking. For higher SES smokers, who already have strong intentions to quit, intentions to quit only become somewhat stronger with stronger nonsmoker identities. However, this finding was not replicated in Chapter 3, as the relations between identity and intention to quit was not moderated by SES in this study. Relations

between quitter self-identity and intention to quit also did not differ with SES in Chapter 6 (Identity smoking large-scale longitudinal).

Identity is more robust to change among lower SES smokers and ex-smokers

In addition to differences in identity strength between SES groups, Chapter 7 (Identity change longitudinal quantitative) showed that identity is more robust to change among lower SES smokers and ex-smokers. Smoker self-identity increases more strongly over time among lower SES smokers (vs. higher SES smokers), such that smoking becomes integrated in the self-concept relatively quickly. After quitting, smoking stays part of the self-concept for a longer time among lower SES ex-smokers (vs. higher SES ex-smokers), even when they no longer smoke. Similarly, quitter self-identity increases more slowly over time among lower SES smokers and ex-smokers compared to their higher SES counterparts. In other words, lower SES ex-smokers have more difficulty to come to perceive themselves as quitters.

These findings fit with the SES differences in smoking behavior more generally. In addition, lower SES smokers may perceive nonsmoking as part of a range of health promoting behaviors that do not fit within their social environment or social class. For example, a study among members of ethnic minority groups showed that healthy behaviors such as exercising or watching diet were perceived as belonging with the ethnic majority outgroup, whereas unhealthy behaviors were considered as defining the ethnic minority ingroup (Oyserman, Fryberg, & Yoder, 2007). Relatedly, lower SES smokers and ex-smokers may have more difficulty to identify with quitting and nonsmoking because these identities does not easily fit with their social environment (Iyer, Jetten, Tsivrikos, Postmes, & Haslam, 2009), where smoking is common and accepted, perhaps even valued (Honjo et al., 2006; Sorensen et al., 2002; Wiltshire et al., 2003). People with lower SES more generally have been found to have a weaker future time perspective (Guthrie, Butler, & Ward, 2009) and less clear self-concepts (Na, Chan, Lodi-Smith, & Park, 2016). As such, lower SES smokers might be less inclined to think about their future selves as quitters or nonsmokers.

Take-home messages

In conclusion, the above showed that smokers from lower SES backgrounds are heavier smokers than their higher SES counterparts, and their social environment appears to be less supportive of quitting. Those with lower SES also perceive themselves in ways that make quitting more difficult (i.e., stronger smoker self-identities, weaker quitter and nonsmoker self-identities). In addition, smoker and quitter self-identities are more robust to change among lower SES smokers and ex-smokers.

Implications

The results of this dissertation have implications for theory and practice. These implications are outlined below, and directions for future research are provided.

Theoretical implications

Self-identities related to the 'new behavior' of nonsmoking are important

The studies together showed that nonsmoker and quitter identities are more important for smoking and quitting behavior than smoker identities. The question that then remains is: Why is this so?

Theorizing on possible selves can explain why nonsmoker and quitter identities are more important for smoking and quitting behavior than smoker identities. That is, a key difference between these types of identities is that nonsmoker and quitter identities are associated with the new behavior (nonsmoking), whereas smoker identities are based on smokers' current behavior (smoking). As such, nonsmoker and quitter identities are 'possible selves' that smokers may become in the future, whereas the identity as a smoker can be seen as a 'current self' that smokers hold. Possible selves and current selves exert different influences on behavior. Possible selves serve as future goals that are highly personally relevant, and therefore exert a strong motivational influence on behavior in the present (Barreto & Frazier, 2012; Markus & Nurius, 1986; Oyserman, & James, 2011). People typically hold ideal selves and feared selves (i.e., their images of the person that they desire and fear to become, respectively), and are motivated to behave in ways that allow them to become their ideal selves and avoid becoming their feared selves. Nonsmoker and quitter identities can be seen as ideal selves. As such, smokers who essentially perceive themselves as nonsmokers will be motivated to behave in ways that allow them to become nonsmokers, such that they will attempt to quit smoking and make efforts to stay abstinent. However, smokers who lack a possible self as a nonsmoker do not have such a motivational guide for behavior, and are less likely to move toward nonsmoking.

Whereas nonsmoker and identities are, thus, possible selves that motivate behavior, smoker identities can be considered as current selves. People are motivated to maintain a positive view of who they are, their current self, and will therefore avoid behavior that conflicts with their identity and engage in identity management strategies when their identity is threatened (Ellemers, Spears, & Doosje, 2002; Hoek, Maubach, Stevenson, Gendall, & Edwards, 2013; Vohs & Heatherton, 2004). However, although current identities (e.g., smoker identity) may thus motivate continuation of behavior, they are less likely to serve as an impetus for behavior change (e.g., quitting smoking) because they do not contain a behavioral goal (e.g., becoming a nonsmoker).

Notably, nonsmoker and quitter identities -both possible selves- may each play different roles during the process of quitting smoking. The identity as a quitter can be

considered as a transitional identity that allows smokers to move from being a smoker to becoming a nonsmoker, whereas the identity as a nonsmoker is a more ultimate identity (Vangeli & West, 2012). Moreover, the identity as a quitter or nonsmoker is most likely to be a possible self before a quit attempt, affecting behavior by providing a personally relevant goal. However, these identities may become current selves in the process of quitting or after quitting successfully. PRIME theory suggests that current identities affect behavior through identity-based rules, such that people behave in line with well-established identities (West, 2006). People with strong (current) nonsmoker identities hold identity-based behavioral rules that prevent them from smoking, e.g. 'I am a nonsmoker, so I do not smoke'. In contrast, a weak smoker identity is less likely to be accompanied by such no-smoking rules, and is therefore less likely to sustain abstinence.

Our results also appear to indicate that self-identity is more important for smoking and quitting than group-identity. It could be the case that self-identity is closer to a person's sense of self than group identity, and therefore more strongly associated with (smoking) behavior. People hold multiple group identities and the influence of group-identity on behavior is likely to depend on the situational context (Tajfel & Turner, 1979, 1986; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987), whereas a deeply entrenched self-identity is likely to exert its influence on behavior across situations, thereby creating behavioral stability (West, 2006). Consistent with theorizing on social identity, group identification is likely to take on a more prominent role when the group is under threat or when collective behavior becomes useful for obtaining better outcomes or preventing worse outcomes increasing or protecting outcomes (Branscombe, Ellemers, Spears, & Doosje, 1999; Ouwerkerk, De Gilder, & De Vries, 2001; Ouwerkerk & Ellemers, 2002; Ouwerkerk, Ellemers, & De Gilder, 1999). In line with this reasoning, identification with nonsmokers was related to responses to the smoking ban in hospitality venues, which may be more strongly embedded in social situations and threat than intentions to quit and quit attempts (Ch2).

In sum, this dissertation showed that the self-identities associated with the 'new behavior' of nonsmoking (i.e., nonsmoker and quitter self-identities) are particularly relevant to smoking cessation, and more so than identification with smoking. Although such identities associated with new behavior have been studied widely in possible selves research -which investigates people's perceptions of who they may become in the future-, theories on identity such as PRIME theory (West, 2006) and identity theory (Burke, 2006) focus more strongly on current identities. We recommend that identities associated with new behavior, in this case as nonsmokers or quitters, be incorporated in theories on identity as distinct from current identities. Similarly, identity should be incorporated in psychological theories such as the theory of planned behavior (Ajzen, 1988, 1991; see also Rise et al., 2010) and social cognitive theory (Bandura, 1991, 2001).

Moreover, research on identity and smoking cessation should examine quitter and nonsmoker identities in addition to smoker identities.

Identity conflict is not sufficient to initiate identity change

The qualitative study (Ch5. Identity change longitudinal qualitative) shed a new light on how identity may change in the process of quitting smoking. Identity shift theory (Kearney & O'Sullivan, 2003) and identity control theory (Burke, 2006) both propose that identity conflict may initiate identity change. The Chapter 5 study added that people need to be able to identify with their future identity in order for change to occur. Indeed, most of the smokers included in the study experienced conflict, but identity only changed in those who were able to identify with their future self as a nonsmoker. Similarly, identity shift theory proposes that identity change and behavior change facilitate one another, but findings from the research presented in Chapter 5 showed that this behavior change needs to be accompanied by a sense of mastery (i.e., feeling proud and capable of changing behavior) in order for it to enable identification with the new behavior.

Furthermore, whereas behavior change is, thus, part of identity shift theory, theories on identity (e.g., PRIME theory - West, 2006; social identity theory - Tajfel & Turner, 1979, 1986; Turner et al., 1987) typically focus strongly on how identity affects behavior than on how behavior affects identity. This dissertation showed that behavior also affects how people perceive themselves. If replicated, theories on identity may be advanced by explicitly incorporating behavior as a source of identity.

Practical implications

The results of this dissertation call for interventions that facilitate identification with quitting and nonsmoking among smokers and ex-smokers, as these are likely to contribute to successful smoking cessation. Future work should therefore strive for the integration of this knowledge into smoking cessation interventions. Based on the research in this dissertation and on research by others, several recommendations for such interventions can be made. Chapter 4 (Quitter self-identity experimental) showed that writing exercises can be a promising method, but as the effects were modest, future research should examine ways to make writing exercises more effective. For example, participants could be encouraged to spend more time thinking or writing about their mental images, or to write about their identity on more than one occasion (Frattaroli, 2006; King, 2001; Layous, Nelson, & Lyubomirsky, 2012; Murru & Ginis, 2010; Ouellette, Hessling, Gibbons, Reis-Bergan, & Gerrard, 2005).

Building on the findings of the qualitative study (Ch5. Identity change longitudinal qualitative), writing exercises may also include questions that help people to perceive the boundaries of their current identity and the new identity as being more permeable,

for example by asking about attributes of the new identity that they feel capable of obtaining. The qualitative study also showed that a sense of identity continuity and mastery of quitting may facilitate identity change. In order to facilitate a sense of self continuity, those who (intend to) undertake a quit attempt may be encouraged to focus on the core aspects of who they are that stay the same in the process of change, or that they can even express more strongly now that they are quitting smoking (e.g., self-perception as independent). Relatedly, questions that help smokers to focus on other identities that they perceive as matching with being a nonsmoker and conflicting with being a smoker (e.g., identity as a parent) may facilitate a stronger sense of a continuous self. Furthermore, smokers who are quitting smoking may acquire a stronger sense of mastery of quitting if they are stimulated to focus on the progress they have made with quitting so far. Questions that invite smokers to attribute their successes in quitting internally (i.e., perceiving the success as being caused by themselves, rather than external factors) are particularly likely to be helpful. Moreover, whereas the writing exercise in Chapter 4 focused on quitter identity as a desired identity, it may be beneficial to strengthen both desired (i.e., quitter, nonsmoker) and undesired (i.e., continuing smoker) identities within the same person. This is likely to facilitate strategies to both approach the desired future identity and avoid the undesired future identity (Oyserman & James, 2009).

For smoking cessation to be effective, the new identity needs to become strongly embedded in people's sense of who they are. It also needs to be accessible, especially in moments that constitute a risk for relapse, such as when experiencing cravings. Identities are more likely to be accessible if they are more comprehensive (Frings & Albery, 2015). For example, a nonsmoker identity that is represented as 'healthy, free, independent and a good mother' is more comprehensive than one consisting only of 'healthy'. Interventions should therefore encourage smokers to develop comprehensive representations of themselves as quitters or nonsmokers. Reminders or booster sessions may also be used to keep the new identity vivid and accessible (Frattaroli, 2006; King, 2001; Layous et al., 2012). For example, people in the initial phase of behavior change may be presented with parts of their own narratives on their smartphones.

Such identity-based interventions are more likely to be effective if they are tailored to participant characteristics, as smokers will then perceive the intervention as more personally relevant (Ritterband, Thorndike, Cox, Kovatchev, & Gonder-Frederick, 2009; Smit, Linn, & van Weert, 2015; Te Poel, Bolman, Reubsaet, & de Vries, 2009; Wangberg, Nilsen, Antypas, & Gram, 2011). Although identity interventions are personally relevant by nature, an interesting route to explore to further tailor the intervention is the modality through which the intervention is presented. People differ in their preferences for verbal or visual processing, such that writing exercises may benefit some people more than others (Blazhenkova, & Kozhevnikov, 2009; Linn, Alblas, van Weert, & Bol, 2015; Mayer & Massa, 2003; Smit et al., 2015). People with a stronger visual preference are expected

to respond better to a visually oriented intervention, 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).

Although all smokers may benefit from such identity-based interventions, efforts to increase identification with nonsmoking and quitting should be aimed particularly at lower SES smokers and ex-smokers, as smoking behavior and identity are more resistant to change among those with lower SES. In addition, it is important to develop interventions to which people with lower SES respond well. It has been suggested that people with lower SES backgrounds 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 SES smokers and ex-smokers. However, the effectiveness of visual approaches for lower SES groups has not consistently been shown (Stanczyk et al., 2014; Stanczyk, Crutzen, Bolman, Muris, & de Vries, 2013; Walthouwer, Oenema, Lechner, & de Vries, 2015). Furthermore, results showed that identity change is facilitated by pro-quitting social norms, but people with lower SES are more likely to be part of groups in which smoking is common and accepted. The optimal approach for lower SES smokers would therefore combine an identity-based intervention with efforts to increase social norms in favor of quitting in a neighborhood, at the workplace or in society at large, for example by adding such elements to antismoking campaigns.

Finally, the results of this dissertation showed that behavior impacts identity, such that people come to see themselves in terms of the behaviors that they (frequently) engage in. As such, changing smoking behavior may also be a vehicle to change smoking-related identity, for example through cognitive behavioral therapy approaches. In particular, parts of schema-focused therapy (Young, 1994), which is used to change core beliefs about the self and others, may also be useful to change self-perceptions of persistent smokers with strong smoker identities.

Main limitations

While the results present interesting new avenues to understand smoking cessation and the role of identity in smoking cessation, the studies presented in this dissertation of course have limitations. First, smoking status and quit attempts were measured through self-report, which may be subject to social desirability bias. Biochemical verification would have been a more objective alternative (Connor Gorber, Schofield-Hurwitz, Hardt, Levasseur, & Tremblay, 2009), but the nature of the studies -with most measurements taken online- did not allow for this. Importantly however, recent evidence suggests that self-report of smoking status is reliable and yields very similar results to biochemical verification of smoking status (Van der Aalst & De Koning, 2016).

Second, SES was operationalized as educational level, as is common in smoking research. A more comprehensive measure including income or occupation in addition

to education could also have been used (Schaap, van Agt, & Kunst, 2008). Although education affects occupation and income later in life, income and occupation may be considered a more accurate reflection of an individual's current socio-economic position. However, educational level has repeatedly been found to be a better indicator of risk of smoking and daily smoking than income and occupational class (Huisman, Kunst, & Mackenbach, 2005; Huisman et al., 2012; Schaap & Kunst, 2009). On a more practical note, people may be less willing to provide their income than their educational level (Ryder et al., 2011), as was the case in the studies described in Chapter 6 (Identity smoking large-scale longitudinal) and 7 (Identity change longitudinal quantitative) (those results not reported in these chapters). This particularly poses a problem when missing values are related to income levels (Ryder et al., 2011), for example when those with a lower income are less inclined to report their income level.

Third, the specific identity constructs that were measured differed somewhat between studies – this is both a strength and a possible weakness. Chapter 3 (SES identity cross-sectional) used a very elaborate measure of identity -encompassing smoker, nonsmoker and quitter self- and group-identities, with three component of group-identities being measured-, while the other studies measured more limited smoking-related identities. In addition, the specific items used to measure each of the identity constructs differed slightly between the studies. However, the finding that nonsmoker and quitter identities are more relevant than smoker identities emerged across identity measurements and smoking-related outcomes, underscoring the stability of this finding. This dissertation is then also the first line of work that offers a comprehensive analysis of the relative importance of different identity constructs, and the new insights provided by this approach are a strength of this dissertation.

Suggestions for future research

Other aspects of identity

The quantitative studies presented in this dissertation investigated smoker, nonsmoker and quitter self- and group-identities. Other aspects of identity may also be interesting to examine in future research. Novel self-conceptualizations emerged in the qualitative study (Ch5. Identity change longitudinal qualitative), with participants identifying as 'ex-smoker in rehab' or 'smoker who does not smoke'. In addition, smoking was related to other identities and self-views, which either conflicted (e.g., as a father, as autonomous) or matched (e.g., as a tough guy, as recalcitrant) with smoking. It would be interesting to examine the role of smoking in how smokers perceive themselves more broadly, beyond specific smoking-related identities. Furthermore, work on possible selves suggests that in addition to nonsmoker and quitter identities as ideal possible selves, feared possible selves such as that of an 'ill, continuing smoker' may be important (Barreto & Frazier, 2012; Markus & Nurius, 1986). In addition, the recently developed Smoker Identity Scale

includes items that tap into identity loss when quitting smoking, for example 'I am afraid if I do not smoke, I will not be the same' (Dupont et al., 2015). Given that a sense of loss of self impaired identity change in the qualitative study (Ch5), this perception of smoking as essential for a continuous sense of self is likely to be relevant. Moreover, identity preference has recently been proposed as a potentially relevant concept, that is, the relative strength of one identity (e.g., smoker) over another identity (e.g., nonsmoker) (Frings & Albery, 2015). Smokers can be expected to engage in a quit attempt when their nonsmoker identity is stronger than their smoker identity, but may be held back when both identities are equally strong.

Implicit smoking-related identities

Recent work further suggested that the measurement of implicit identities in relation to smoking may be useful. Most work on smoking and identity to date, including this dissertation, focused on explicit identities, which are accessible through introspection and self-reflection and can therefore be measured through self-report (Lindgren et al., 2016). Implicit identities are considered to be more impulsive and reflexive and less controllable than explicit identities. Although people thus have less insight into their implicit identities, these may be faster in affecting behavior than explicit identities. Phrased differently, implicit identities may have even stronger effects on the impulses and urges that lead to behavior than explicit identities (West, 2006). The measurement of implicit identities may also be less affected by social desirability concerns (Lindgren et al., 2016), which could potentially affect explicit measures of identity. Moreover, implicit identities may be subject to contextual factors (Devos & Banaji, 2003; Gawronski & Cesario, 2013; Mitchell, Nosek, & Banaji, 2003; Wittenberg, Judd, & Park, 2001), meaning that they could be fruitful concepts to examine in relation to influences of SES context.

Implicit identities may be measured through a modified implicit association test (IAT) (Frings & Albery, 2015; Lindgren, Neighbors, Gasser, Ramirez, & Cvencek, 2016) or a modification of the recently developed relational responding task (RRT) (De Houwer, Heider, Spruyt, Roets, & Hughes, 2015; Tibboel, De Houwer, Dirix, & Spruyt, 2017). In a modified IAT for identity, participants are asked to sort pairs of stimuli and stronger associations -for example between 'me' and 'smoker'- are assumed to result in relatively shorter reaction times (Lindgren et al., 2016). The RRT (De Houwer et al., 2015), which is similar to the IAT, measures implicit beliefs and has already been used to measure implicit beliefs about smoking urges among smokers (Tibboel et al., 2017). In this study, participants indicated whether statements about smoking urges were true or false according to different instructions (e.g., respond as if experiencing an urge to smoke). Analogously, for the measurement of implicit identity statements such as 'Smoking is an important part of who I am' can be used, with participants receiving instructions to respond as if they see themselves as smokers or, alternatively, as if they see themselves

as nonsmokers. Importantly, although implicit measures of identity appear promising, findings in the field of alcohol use and drug addiction suggest that explicit and implicit measures are complimentary and are both valuable (Frings & Albery, 2015; Lindgren et al., 2016).

A remaining question: How does identity translate into behavior?

Although the studies in this dissertation clearly showed that identity leads to behavior change, the specific processes through which this happens are less clear. The literature offers a number of possible mechanisms, which remain to be investigated in the context of smoking and more broadly. It could be, as suggested by PRIME theory (West, 2006), that identity affects behavior through identity-based rules. Alternatively, in line with possible selves theory, identity may provide people with clearer goals for whom they want, and do not want, to become in the future (Barreto & Frazier, 2012; Markus & Nurius, 1986; Oyserman & James, 2011). In line with self determination theory, identity may also increase internally driven motivation for behavior (Ryan & Deci, 2000). Self-determination theory distinguishes between intrinsic motivation (i.e., engaging in behavior because of the inherent satisfaction that this activity provides) and extrinsic motivation for behavior (i.e., engaging in behavior to obtain a separable outcome). Intrinsic motivation affects behavior through intrinsic regulation processes (e.g., satisfaction/enjoyment). Extrinsic motivation may affect behavior through different regulation styles (i.e., external, introjected, identified, and integrated) that can be closer to, or further away from, intrinsic regulation. The type of extrinsic regulation that is considered to be closest to intrinsic regulation is 'integrated regulation', which 'occurs when identified regulations are fully assimilated to the self' (Ryan & Deci, 2002, p. 72). In other words, being motivated to engage in behavior because this fits with central self-views is close to engaging in behavior because this is, in itself, satisfying.

Another interesting route to explore concerns the neural processes that are associated with identity. Brain activity in the medial prefrontal cortex (MPFC) is reported to reflect self-related processing, and functional magnetic resonance imaging (fMRI) studies have shown that activity in the MPFC mediates the effects of health communication messages on behavior (for a review see Kaye, White, & Lewis, 2016). Studies in the field of smoking indeed showed that exposure to tailored smoking cessation messages led to stronger MPFC activity than non-tailored messages (Chua et al., 2009). Furthermore, smokers who showed stronger MPFC activation in response to tailored smoking cessation messages were more likely to quit smoking four months later (Chua et al., 2011). Similarly, brain activity in an MPFC region in response to smoking cessation messages predicted successful quitting, controlling for self-reported intention to quit, self-efficacy and ability to relate to the messages (Falk et al., 2011). In a similar way, MPFC activation in response to identity-based messages and interventions can be measured and

used to predict subsequent smoking cessation. For example, brain activity in relevant MPFC regions can be measured among smokers who participated in an identity-based writing intervention before the fMRI session, and are presented in a fMRI scanner with self-generated statements about their future self as a nonsmoker. Between-participant differences in MPFC activity in response to these statements can then be used -as a proxy of depth of self-relevant processing- to predict smoking cessation following the intervention, beyond self-report measures of explicit identity. In sum, different routes from identity to behavior have been forwarded, but it is, as yet, unknown how identity exactly affects behavior. Research into these processes will advance theorizing on identity.

CONCLUSIONS

Using a multimethod approach, the studies presented in this dissertation examined identity and identity change in relation to smoking and quitting among lower and higher SES groups. Three main conclusions can be drawn. First, results showed that nonsmoker and quitter identities are more important than smoker identities for intentions to quit, quit attempts, (long-term) quit success and responses to the Dutch smoking ban in hospitality venues. In addition, self-identities seemed more important than group-identities. Second, identity changes in response to smoking behavior and social norms, and identity change is facilitated by permeable identity boundaries, a continuous sense of self, and a sense of mastery of quitting. Third, lower SES smokers and ex-smokers identify more strongly with smoking - and lower SES smokers identify less strongly with nonsmoking - than their higher SES counterparts, and in lower SES groups identity is more resistant to change. As outlined above, these findings have important implications for theory and practice.

Let us now return to Esther and Louis, the two smokers who were introduced at the beginning of this dissertation. Although they both intended to quit, only Louis attempted to do so. Esther continued to smoke, despite the conflict that she experienced between her smoking behavior and identity. She could not picture herself as a nonsmoker and this held her back from quitting. Louis tried to quit smoking and managed to stay abstinent during the study, although he continued to struggle with being 'a smoker who does not smoke'. Nonsmoking did not become part of his identity, and the follow-up showed that he had relapsed. However, two other smokers, Iris and Julia, quit smoking during the study, showed an identity transition toward a nonsmoker identity, and reached stable abstinence. It is hoped that this dissertation contributes to the development of identity-based interventions that will be integrated into the healthcare system and help more smokers who wish to quit smoking to do so successfully and enduringly.

It [smoking] is a closed period in my life. And that, you carry it with you, further. It wears out more and more. And then, that, you spread your wings and you are completely loose, free again. (Iris, T3)

REFERENCES

Ajzen, I. (1988). *Attitudes, personality, and behavior*. Buckingham, UK: Open University Press.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*, 179-211.

Bandura, A. (1991). Social cognitive theory of self-regulation. *Organizational Behavior and Human Decision Processes*, *50*(2), 248-287.

Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, *52*(1), 1-26. doi: 10.1146/annurev.psych.52.1.1

Barreto, M. L., & Frazier, L. D. (2012). Coping with life events through possible selves. *Journal of Applied Social Psychology, 42*(7), 1785-1810. doi: 10.1111/j.1559-1816.2012.00918.x

Bem, D. J. (1972). Self-perception theory. *Advances in Experimental Social Psychology*, *6*, 1-62. doi: 10.1016/S0065-2601(08)60024-6.

Best, D., Beckwith, M., Haslam, C., Alexander Haslam, S., Jetten, J., Mawson, E., & Lubman, D. I. (2015). Overcoming alcohol and other drug addiction as a process of social identity transition: the social identity model of recovery (SIMOR). *Addiction Research & Theory, 24*(2), 111-123. doi: 10.3109/16066359.2015.1075980

Blazhenkova, O., & Kozhevnikov, M. (2009). The new object-spatial-verbal cognitive style model: Theory and measurement. *Applied Cognitive Psychology, 23*(5), 638-663. doi: 10.1002/acp.1473

Branscombe, N. R., Ellemers, N., Spears, R., & Doosje, B. (1999). The context and content of social identity threat. In N. Ellemers, R. Spears, & B. Doosje (Eds.), *Social identity: Context, commitment, content* (pp. 35–58). Oxford, UK: Blackwell.

Bricard, D., Jusot, F., Beck, F., Khlat, M., & Legleye, S. (2016). Educational inequalities in smoking over the life cycle: an analysis by cohort and gender. *International Journal of Public Health, 61*, 101-109.

Brown, J. M. (1996). Redefining smoking and the self as a nonsmoker. *Western Journal of Nursing Research, 18*(4), 414-428. doi: 10.1177/019394599601800404

Burke, P. J. (2006). Identity change. *Social Psychology Quarterly, 69*(1), 81-96.

Chua, H. F., Liberzon, I., Welsh, R. C., & Strecher, V. J. (2009). Neural correlates of message tailoring and self-relatedness in smoking cessation programming. *Biological Psychiatry, 65*(2), 165-168. doi: 10.1016/j.biopsych.2008.08.030

Chua, H. F., Ho, S. S., Jasinska, A. J., Polk, T. A., Welsh, R. C., Liberzon, I., & Strecher, V. J. (2011). Self-related neural response to tailored smoking-cessation messages predicts quitting. *Nature Neuroscience*, *14*(4), 426-427. doi: 10.1038/nn.2761

Connor Gorber, S., Schofield-Hurwitz, S., Hardt, J., Levasseur, G., & Tremblay, M. (2009). The accuracy of self-reported smoking: a systematic review of the relationship between self-reported and cotinine-assessed smoking status. *Nicotine & Tobacco Research, 11*(1), 12-24. doi: 10.1093/ntr/ntn010

De Houwer, J., Heider, N., Spruyt, A., Roets, A., & Hughes, S. (2015). The relational responding task: toward a new implicit measure of beliefs. *Frontiers in Psychology*, *6*, 319. doi: 10.3389/fpsyg.2015.00319

Devos, T., & Banaji, M. R. (2003). Implicit self and identity. *Annals of the New York Academy of Sciences*, *1001*(1), 177-211. doi: 10.1196/annals.1279.009

Dupont, P., Tack, V., Blecha, L., Reynaud, M., Benyamina, A., Amirouche, A., & Aubin, H. J. (2015). Smoker's identity scale: Measuring identity in tobacco dependence and its relationship with confidence in quitting. *American Journal on Addictions, 24*(7), 607-612. doi: 10.1111/ajad.12272

Ellemers, N., Spears, R., & Doosje, B. (2002). Self and social identity. *Annual Review of Psychology*, *53*(1), 161-186. doi: 10.1146/annurev.psych.53.100901.135228

Falk, E. B., Berkman, E. T., Whalen, D., & Lieberman, M. D. (2011). Neural activity during health messaging predicts reductions in smoking above and beyond self-report. *Health Psychology*, *30*(2), 177-185. doi: 10.1037/a0022259

Fernandez, E., Schiaffino, A., Borrell, C., Benach, J., Ariza, C., Ramon, J. M., . . . Kunst, A. (2006). Social class, education, and smoking cessation: Long-term follow-up of patients treated at a smoking cessation unit. *Nicotine & Tobacco Research, 8*(1), 29-36. doi: 10.1080/14622200500264432

Frattaroli, J. (2006). Experimental disclosure and its moderators: a meta-analysis. *Psychological Bulletin, 132*(6), 823-865. doi: 10.1037/0033-2909.132.6.823

Frings, D., & Albery, I. P. (2015). The Social Identity Model of Cessation Maintenance: formulation and initial evidence. *Addictive Behaviors, 44*, 35-42. doi: 10.1016/j.addbeh.2014.10.023

Gawronski, B., & Cesario, J. (2013). Of mice and men: What animal research can tell us about context effects on automatic responses in humans. *Personality and Social Psychology Review*, *17*(2), 187-215. doi: 10.1177/1088868313480096

Gibbons, F. X., & Eggleston, T. J. (1996). Smoker networks and the "typical smoker": A prospective analysis of smoking cessation. *Health Psychology, 15*(469-477).

Guthrie, L. C., Butler, S. C., & Ward, M. M. (2009). Time perspective and socioeconomic status: a link to socioeconomic disparities in health? *Social Science and Medicine, 68*(12), 2145-2151. doi: 10.1016/j.socscimed.2009.04.004

Hertel, A. W., & Mermelstein, R. J. (2012). Smoker identity and smoking escalation among adolescents. *Health Psychology, 31*(4), 467-475. doi: 10.1037/a0028923

Hoek, J., Maubach, N., Stevenson, R., Gendall, P., & Edwards, R. (2013). Social smokers' management of conflicted identities. *Tobacco Control, 22*(4), 261-265. doi: 10.1136/tobaccocontrol-2011-050176

Høie, M., Moan, I. S., & Rise, J. (2010). An extended version of the theory of planned behavour: Prediction of intentions to quit smoking using past behaviour as moderator. *Addiction Research & Theory, 18*(5), 572-585. doi: 10.3109/16066350903474386

Honjo, K., Tsutsumi, A., Kawachi, I., & Kawakami, N. (2006). What accounts for the relationship between social class and smoking cessation? Results of a path analysis. *Social Science and Medicine, 62*(2), 317-328. doi: 10.1016/j.socscimed.2005.06.011

Huisman, M., Kunst, A. E., & Mackenbach, J. P. (2005). Inequalities in the prevalence of smoking in the European Union: comparing education and income. *Preventive Medicine, 40*(6), 756-764. doi: 10.1016/j.ypmed.2004.09.022

Huisman, M., Van Lenthe, F. J., Giskes, K., Kamphuis, C. B., Brug, J., & Mackenbach, J. P. (2012). Explaining socio-economic inequalities in daily smoking: a social-ecological approach. *European Journal of Public Health, 22*(2), 238-243. doi: 10.1093/eurpub/ckr039

Iyer, A., Jetten, J., Tsivrikos, D., Postmes, T., & Haslam, S. A. (2009). The more (and the more compatible) the merrier: Multiple group memberships and identity compatibility as predictors of adjustment after life transitions. *British Journal of Social Psychology, 48*(4), 707-733.

Kaye, S. A., White, M. J., & Lewis, I. (2016). The use of neurocognitive methods in assessing health communication messages: A systematic review. *Journal of Health Psychology,* 1359105316630138. doi: 10.1177/1359105316630138

Kearney, M. H., & O'Sullivan, J. (2003). Identity shifts as turning points in health behavior change. *Western Journal of Nursing Research, 25*(2), 134-152. doi: 10.1177/0193945902250032

King, L. A. (2001). The health benefits of writing about life goals. *Personality and Social Psychology Bulletin, 27*(7), 798-807.

Layous, K., Nelson, S. K., & Lyubomirsky, S. (2012). What is the optimal way to deliver a positive activity intervention? The case of writing about one's best possible selves. *Journal of Happiness Studies, 14*(2), 635-654. doi: 10.1007/s10902-012-9346-2

Lindgren, K. P., Neighbors, C., Gasser, M. L., Ramirez, J. J., & Cvencek, D. (2016). A review of implicit and explicit substance self-concept as a predictor of alcohol and tobacco use and misuse. *American Journal of Drug and Alcohol Abuse*, 1-10. doi: 10.1080/00952990.2016.1229324

Linn, A. J., Alblas, M., van Weert, J., & Bol, N. (2015). Een kwestie van voorkeur? Een experimentele studie naar het aanpassen van gezondheidsinstructies aan de voorkeur voor modaliteit van de ontvanger. *Tijdschrift voor Communicatiewetenschap, 43*(4), 362-377.

Markus, H., & Nurius, P. (1986). Possible selves. *American Psychologist, 41*, 954-969.

Mayer, R. E., & Massa, L. J. (2003). Three facets of visual and verbal learners: cognitive ability, cognitive style, and learning preference. *Journal of Educational Psychology, 95*(4), 833-846. doi: 10.1037/0022-0663.95.4.833

Mitchell, J. P., Nosek, B. A., & Banaji, M. R. (2003). Contextual variations in implicit evaluation. *Journal of Experimental Psychology: General*, *132*(3), 455-469. doi: 10.1037/0096-3445.132.3.455

Mizock, L., Russinova, Z., & Shani, R. (2014). New roads paved on losses: Photovoice perspectives about recovery from mental illness. *Qualitative Health Research*, *24*(11), 1481-1491. doi: 10.1177/1049732314548686

Mizock, L., Russinova, Z., & DeCastro, S. (2015). Recovery narrative photovoice: Feasibility of a writing and photography intervention for serious mental illnesses. *Psychiatric Rehabilitation Journal*, *38*(3), 279-282. doi: 10.1037/prj0000111

Moan, I. S., & Rise, J. (2005). Quitting smoking: Applying an extended version of the theory of planned behavior to predict intention and behavior. *Journal of Applied Biobehavioral Research, 10*, 39-68.

Moan, I. S., & Rise, J. (2006). Predicting smoking reduction among adolescents using an extended version of the theory of planned behaviour. *Psychology & Health, 21*(6), 717-738. doi: 10.1080/14768320600603448

Murru, E. C., & Ginis, K. A. M. (2010). Imagining the possibilities: The effects of a possible selves intervention on self-regulatory efficacy and exercise behavior. *Journal of Sport and Exercise Psychology, 32*(4), 537-554.

Na, J., Chan, M. Y., Lodi-Smith, J., & Park, D. C. (2016). Social-class differences in self-concept clarity and their implications for well-being. *Journal of Health Psychology*, online first.

Ouellette, J. A., Hessling, R., Gibbons, F. X., Reis-Bergan, M., & Gerrard, M. (2005). Using images to increase exercise behavior: prototypes versus possible selves. *Personality & Social Psychology Bulletin, 31*(5), 610-620. doi: 10.1177/0146167204271589

Ouwerkerk, J. W., de Gilder, D., & de Vries, N. K. (2000). When the going gets tough, the tough get going: Social identification and individual effort in intergroup competition. *Personality and Social Psychology Bulletin*, *26*(12), 1550-1559. doi: 10.1177/01461672002612009

Ouwerkerk, J. W., & Ellemers, N. (2002). The benefits of being disadvantaged: Performance-related circumstances and consequences of intergroup comparisons. *European Journal of Social Psychology*, *32*(1), 73-91. doi: 10.1002/ejsp.62

Ouwerkerk, J. W., Ellemers, N., & de Gilder, D. (1999). Group commitment and individual effort in experimental and organizational contexts. In N. Ellemers, R. Spears, & B. Doosje (Eds.), *Social identity: Context, commitment, content* (pp. 184–204). Oxford,England: Blackwell.

Oyserman, D., & James, L. (2011). Possible identities. In S. J. Schwartz, K. Luyckx, & V. L. Vignoles (Eds.), *Handbook of Identity Theory and Research* (pp. 117-145). New York: Springer.

Oyserman, D., Fryberg, S. A., & Yoder, N. (2007). Identity-based motivation and health. *Journal of Personality and Social Psychology, 93*(6), 1011-1027. doi: 10.1037/0022-3514.93.6.1011

Oyserman, D., & James, L. (2009). Possible selves: From content to process. In K. Markman, W. M. P. Klein, & J. A. Suhr (Eds.), *Handbook of Imagination and Mental Stimulation* (pp. 373-394). New York: Psychology Press.

Pisinger, C., Aadahl, M., Toft, U., & Jorgensen, T. (2011). Motives to quit smoking and reasons to relapse differ by socioeconomic status. *Preventive Medicine, 52*(1), 48-52. doi: 10.1016/j.ypmed.2010.10.007

Reid, J. L., Hammond, D., Boudreau, C., Fong, G. T., & Siahpush, M. (2010). Socioeconomic disparities in quit intentions, quit attempts, and smoking abstinence among smokers in four western countries: Findings from the International Tobacco Control Four Country Survey. *Nicotine & Tobacco Research, 12 Suppl*, S20-33. doi: 10.1093/ntr/ntq051

Rise, J., Sheeran, P., & Hukkelberg, S. (2010). The role of self-identity in the theory of planned behavior: A meta-analysis. *Journal of Applied Social Psychology, 40*(5), 1085-1105.

Ritterband, L. M., Thorndike, F. P., Cox, D. J., Kovatchev, B. P., & Gonder-Frederick, L. A. (2009). A behavior change model for internet interventions. *Annals of Behavioral Medicine*, *38*(1), 18-27. doi: 10.1007/s12160-009-9133-4

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*(1), 68-78. doi: 10.1037/0003-066X.55.1.68

Ryder, A. B., Wilkinson, A. V., McHugh, M. K., Saunders, K., Kachroo, S., D'Amelio, A., Jr., . . . Etzel, C. J. (2011). The advantage of imputation of missing income data to evaluate the association between income and self-reported health status (SRH) in a Mexican American cohort study. *Journal of Immigrant and Minority Health, 13*(6), 1099-1109. doi: 10.1007/s10903-010-9415-8

Schaap, M. M., & Kunst, A. E. (2009). Monitoring of socio-economic inequalities in smoking: learning from the experiences of recent scientific studies. *Public Health, 123*(2), 103-109. doi: 10.1016/j.puhe.2008.10.015

Schaap, M. M., van Agt, H. M., & Kunst, A. E. (2008). Identification of socioeconomic groups at increased risk for smoking in European countries: looking beyond educational level. *Nicotine & Tobacco Research, 10*(2), 359-369. doi: 10.1080/14622200701825098

Shadel, W. G., Mermelstein, R., & Borrelli, B. (1996). Self-concept changes over time in cognitive-behavioral treatment for smoking cessation. *Addictive Behaviors, 21*, 659-663.

Smit, E. S., Linn, A. J., & van Weert, J. C. (2015). Taking online computer-tailoring forward: The potential of tailoring the message frame and delivery mode of online health behaviour change interventions. *European Health Psychologist, 17*(1), 25-31.

Sorensen, G., Emmons, K., Stoddard, A. M., Linnan, L., & Avrunin, J. (2002). Do social influences contribute to occupational differences in quitting smoking and attitudes toward quitting? *American Journal of Health Promotion, 16*(3), 135-141.

Stanczyk, N. E., Bolman, C., Muris, J. W., & de Vries, H. (2011). Study protocol of a Dutch smoking cessation e-health program. *BMC Public Health*, *11*(1), 847. doi: 10.1186/1471-2458-11-847

Stanczyk, N. E., Bolman, C., van Adrichem, M., Candel, M., Muris, J., & de Vries, H. (2014). Comparison of text and video computer-tailored interventions for smoking cessation: randomized controlled trial. *Journal of Medical Internet Research, 16*(3), e69. doi: 10.2196/jmir.3016

Stanczyk, N. E., Crutzen, R., Bolman, C., Muris, J., & de Vries, H. (2013). Influence of delivery strategy on message-processing mechanisms and future adherence to a Dutch computer-tailored smoking cessation intervention. *Journal of Medical Internet Research, 15*(2), e28. doi: 10.2196/jmir.2153

Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33-47). Monterey, CA: Brooks/Cole Publishing Company.

Tajfel, H., & Turner, J. C. (1986). The social identity theory of intergroup behavior. In S. Worchel & W. G. Austin (Eds.), *The psychology of intergroup relations* (pp. 7-24). Chicago, IL: Nelson-Hall.

Te Poel, F., Bolman, C., Reubsaet, A., & de Vries, H. (2009). Efficacy of a single computer-tailored e-mail for smoking cessation: results after 6 months. *Health Education Research*, *24*(6), 930-940. doi: 10.1093/her/cyp036

Tibboel, H., De Houwer, J., Dirix, N., & Spruyt, A. (2017). Beyond associations: Do implicit beliefs play a role in smoking addiction?. *Journal of Psychopharmacology*, *31*(1), 43-54. doi: 10.1177/0269881116665327

Tice, D. M. (1994). Pathways to internalization: When does overt behavior change the self-concept? In T. M. Brinthaupt & R. P. Lipka (Eds.), *Changing the self: Philosophies, techniques, and experiences* (pp. 229-250). Albany, NY: SUNY Press.

Tombor, I., Shahab, L., Brown, J., Notley, C., & West, R. (2015). Does non-smoker identity following quitting predict long-term abstinence? Evidence from a population survey in England. *Addictive Behaviors, 45*, 99-103. doi: 10.1016/j.addbeh.2015.01.026

Tombor, I., Shahab, L., Brown, J., & West, R. (2013). Positive smoker identity as a barrier to quitting smoking: findings from a national survey of smokers in England. *Drug and Alcohol Dependence, 133*(2), 740-745. doi: 10.1016/j.drugalcdep.2013.09.001

Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). *Rediscovering the social group: A self-categorization theory*. Oxford: Basil Blackwell.

Van der Aalst, C. M., & de Koning, H. J. (2016). Biochemical verification of the self-reported smoking status of screened male smokers of the Dutch–Belgian randomized controlled lung cancer screening trial. *Lung Cancer*, *94*, 96-101. doi: 10.1016/j.lungcan.2016.02.001

Van den Putte, B., Yzer, M., Willemsen, M. C., & de Bruijn, G. (2009). The effects of smoking self-identity and quitting self-identity on attempts to quit smoking. *Health Psychology, 28*(535-544).

Vangeli, E., & West, R. (2012). Transition towards a 'non-smoker' identity following smoking cessation: an interpretative phenomenological analysis. *British Journal of Health Psychology, 17*(1), 171-184. doi: 10.1111/j.2044-8287.2011.02031.x

Vohs, K. D., & Heatherton, T. F. (2004). Ego threat elicits different social comparison processes among high and low self-esteem people: Implications for interpersonal perceptions. *Social Cognition, 22*(1), 168-191.

Walthouwer, M. J., Oenema, A., Lechner, L., & de Vries, H. (2015). Comparing a video and text version of a web-based computer-tailored intervention for obesity prevention: A randomized controlled trial. *Journal of Medical Internet Research, 17*(10), e236. doi: 10.2196/jmir.4083

Wangberg, S. C., Nilsen, O., Antypas, K., & Gram, I. T. (2011). Effect of tailoring in an internetbased intervention for smoking cessation: randomized controlled trial. *Journal of Medical Internet Research*, *13*(4), e121. doi: 10.2196/jmir.1605

West, R. (2006). *Theory of addiction*. Oxford: Blackwell, Addiction Press.

Wetter, D. W., Cofta-Gunn, L., Irvin, J. E., Fouladi, R. T., Wright, K., Daza, P., . . . Gritz, E. R. (2005). What accounts for the association of education and smoking cessation? *Preventive Medicine, 40*(4), 452-460. doi: 10.1016/j.ypmed.2004.07.001

Wiltshire, S., Bancroft, A., Parry, O., & Amos, A. (2003). 'I came back here and started smoking again': perceptions and experiences of quitting among disadvantaged smokers. *Health Education Research, 18*(3), 292-303. doi: 10.1093/her/cyf031

Wittenbrink, B., Judd, C. M., & Park, B. (2001). Spontaneous prejudice in context: variability in automatically activated attitudes. *Journal of Personality and Social Psychology*, *81*(5), 815-827. doi: 10.1037//0022-3514.81.5.815

Young, J. E. (1994). *Cognitive therapy for personality disorders: A schema-focused approach*. Sarasota, FL: Professional Resource Press.

CHAPTER 9

ENGLISH SUMMARY

People are motivated to behave in line with their sense of who they are, that is, their identity. This dissertation focused on 'self-identity' and 'group-identity' in relation to smoking. Self-identity refers to perceptions of the self as a person, which can be based on certain behaviors. For example, a strong smoker self-identity means that smoking as a behavior is important for how a smoker perceives himself. However, smokers may identify more strongly with quitting or nonsmoking (i.e., perceive quitting or nonsmoking as fitting with who they are) than with smoking. Group-identity refers to the part of a person's identity that is based on membership in groups. For example, a smoker with a strong smoker group-identity identifies strongly with other smokers and perceives himself as a member of this group. In analogy with self-identity, smokers may identify more strongly with nonsmokers than with smokers. Self-identities and group-identities, together, define how smokers and ex-smokers perceive themselves in relation to smoking. Previous work showed that identity is important for smoking and smoking cessation, and that identity may change over time among smokers who quit smoking. However, several questions remained unanswered in the existing literature, and guided the studies that were presented in this dissertation.

First, the relative importance of smoker, nonsmoker and quitter self- and group-identities for smoking behavior was unknown, as these identities had not been studied jointly. Chapters 2, 3, 5 and 6 therefore examined how different identities that are relevant to smoking affect smoking behavior (Research Question 1).

Second, the process of identity change - both before and after a quit attempt – was largely unclear. Chapters 4 to 7 investigated how identity changes over time in smokers and ex-smokers, both spontaneously and in response to an intervention, and what factors affect identity change (Research Question 2).

Third, differences in smoking behavior and social environments between smokers with lower and higher socio-economic status (SES) led us to expect that identities in relation to smoking might differ with SES as well. However, little was known about possible effects of SES on identity processes. To this end, Chapters 2, 3, 6 and 7 examined whether associations between identity and smoking-related outcomes - as well as identity change processes - differ between people with lower and higher SES (Research Question 3).

A multi-method approach was employed, including cross-sectional and longitudinal studies; observational and experimental studies, and using quantitative as well as qualitative methods. Chapter 2 presented a longitudinal survey with a one-year follow-up, examining how smoker and nonsmoker self- and group-identities as well as SES predict intention to quit, quit attempts and responses to the Dutch smoking ban in hospitality venues. Chapter 3 showed the results of a cross-sectional study which investigated how SES influences smoking behavior, addressing both social support and identity factors. This was followed by an experimental study presented in Chapter 4 which aimed to

strengthen quitter self-identity through a writing exercise. Chapter 5 described the in-depth findings of a longitudinal qualitative study on identity change in the process of quitting smoking. Furthermore, the large-scale longitudinal study presented in Chapter 6 examined reciprocal relations between identity, intention to quit and smoking behavior among smokers and ex-smokers. Finally, Chapter 7 examined identity changes over time among smokers and ex-smokers, and whether these changes can be predicted by SES and psychosocial factors, within the same large-scale longitudinal study. The results of these studies are summarized below.

Research Question 1: How do different identities that are relevant to smoking affect smoking behavior?

The studies presented in this dissertation clearly showed that identity matters. In general, results showed that nonsmoker and quitter identities are more important for smoking and quitting behavior than smoker identities, and self-identities appeared to be more important than group-identities. Identity predicted intentions to quit, quit attempts, quit success and responses to the Dutch smoking ban in hospitality venues, even when controlled for other important factors such as nicotine dependence and years smoked.

Results of the quantitative studies that are relevant to this research question (Chapter 2, 3 and 6) showed that (controlling for other factors that may explain these associations) smokers who more strongly perceive themselves as nonsmokers or quitters have stronger intentions to quit, are more likely to attempt to quit and to quit successfully, and respond more positively to the Dutch smoking ban in hospitality venues. Smoker self-identity was less important, and only predicted intentions to quit in one study (Chapter 3). In addition, group-identity appeared less important than self-identity, although stronger identification with the group of nonsmokers was associated with stronger intentions to quit in one study (Chapter 3), and with stronger positive responses and weaker negative responses to the smoking ban in hospitality venues in another study (Chapter 2). No effects of identification with the group of smokers emerged.

In line with these quantitative results showing the importance of nonsmoker and quitter identities, the qualitative study (Chapter 5) suggested that smokers need to be able to picture themselves as nonsmokers in order to quit successfully. That is, only those participants who identified with nonsmoking, and increasingly perceived themselves as nonsmokers over time, reached stable abstinence two years later. In sum, results consistently showed that nonsmoker and quitter identities are more relevant than smoker identities for smoking behavior.

Research Question 2: How does identity change?

This dissertation further showed that identity changes in response to smoking behavior and social norms; that identity change appears facilitated by permeable identity bound-

aries, a continuous sense of self, and a sense of mastery of quitting; and that writing exercises may be used to change identity. This is described in more detail below.

We found that behavior impacts identity (Chapter 6 and 7), such that 'who we are' is partially based on 'what we do'. Smokers and ex-smokers with higher scores on a 'quit success' measure (ranging from high frequency of smoking to longer duration of abstinence) showed increased quitter self-identity and decreased smoker self- and group-identities one year later. Furthermore, continuing smokers come to perceive themselves more strongly as smokers over time, whereas identification with smoking decreases among ex-smokers who successfully stay abstinent. Moreover, smokers and ex-smokers who perceive stronger pro-quitting social norms in their social environments increasingly perceive themselves as quitters over time, and ex-smokers who perceive stronger pro-quitting social norms identify less strongly with *smoking* over time.

The qualitative study (Chapter 5) suggested that identity change toward a nonsmoker identity is enabled by permeable identity boundaries, a sense of identity continuity and a sense of mastery of quitting. That is, the long-term quitters in this study -who showed identity change- did not perceive clear demarcated boundaries of identities in relation to smoking (e.g. they smoked when 'not a smoker'). Moreover, they perceived themselves as essentially staying the same person in the process of change (identity continuity), and felt proud of the progress they had made and capable of quitting (mastery of quitting).

Finally, the experimental study (Chapter 4) provided some initial support for the use of writing exercises to strengthen quitter self-identity. That is, quitter self-identity appeared to be strengthened through a simple writing exercise, although the effect was small and marginally significant. Quitter self-identity was especially strengthened among smokers who linked quitting smoking to their lifestyle, and among those who wanted to become a quitter for health reasons or because of the positive aspects of quitting.

Research Question 3: Do associations between identity and smoking-related outcomes and identity change processes differ with socio-economic status?

This dissertation was the first to show that strength of smoking-related identities differs with SES (Chapter 2 and 7; Chapter 3 showed almost no differences in identity between SES groups). Smokers and ex-smokers with lower SES backgrounds perceive themselves in ways that make quitting more difficult, and smoker and quitter self-identities are more robust to change among lower SES smokers and ex-smokers.

Specifically, the results showed that in general lower SES smokers identify more strongly with smoking, and less strongly with nonsmoking, than middle and higher SES smokers. Similarly, lower SES *ex-smokers* identify more strongly with smoking than middle SES ex-smokers, but no significant difference was found between lower and higher SES ex-smokers. In addition, one of the studies suggested that the relation between nonsmoker self-identity and intention to quit is stronger among lower than higher SES smokers. In

other words, whereas lower SES smokers in general have weaker intentions to quit than higher SES smokers, their intention to quit becomes stronger when they identify more strongly with nonsmoking. However, this finding was not replicated in Chapter 3 or 6.

We also found that identity is more robust to change toward nonsmoking among lower SES smokers and ex-smokers. Smoker self-identity increases more strongly over time among lower SES smokers (vs. higher SES smokers), and smoking stays part of the self-concept for a longer time among lower SES ex-smokers (vs. higher SES ex-smokers). Similarly, lower SES ex-smokers have more difficulty to come to perceive themselves as quitters.

Conclusions and implications

Three main conclusions can be drawn from the findings of the studies that were presented in this dissertation. First, results showed that nonsmoker and quitter identities are more important than smoker identities for intentions to quit, quit attempts, (long-term) quit success and responses to the Dutch smoking ban in hospitality venues. In addition, self-identities seemed more important than group-identities. Second, identity changes in response to smoking behavior and social norms, and identity change is facilitated by permeable identity boundaries, a continuous sense of self, and a sense of mastery of quitting. Third, lower SES smokers and ex-smokers identify more strongly with smoking - and lower SES smokers identify less strongly with nonsmoking - than their higher SES counterparts, and in lower SES groups identity is more resistant to change.

Based on these findings, we recommend that identities associated with new behavior, in this case as nonsmokers or quitters, be incorporated in theories on identity as distinct from current identities, in this case as smokers. Similarly, research on identity and smoking cessation should examine quitter and nonsmoker identities in addition to smoker identities. In addition, the results of this dissertation call for interventions that facilitate identification with quitting and nonsmoking among smokers and ex-smokers, as these are likely to contribute to successful smoking cessation. Future work should therefore strive for the integration of this new knowledge about smoking and identity into smoking cessation interventions. Although all smokers may benefit from such identity-based interventions, efforts to increase identification with nonsmoking and quitting should be aimed particularly at lower SES smokers and ex-smokers.

In sum, this dissertation showed that 1) nonsmoker and quitter self-identity are important for smoking behavior, 2) that smoking-related identities can change and 3) that socio-economic status plays an important role in how smokers and ex-smokers see themselves in relation to smoking, and in how their identity changes over time. It is hoped that this dissertation contributes to the development of identity-based interventions that help smokers who wish to quit smoking to do so successfully and enduringly.

CHAPTER 10

NEDERLANDSE SAMENVATTING

Mensen zijn gemotiveerd om zich te gedragen op een manier die past bij hoe zij zichzelf zien; hun identiteit. Deze dissertatie richtte zich op 'zelfidentiteit' en 'groepsidentiteit' in relatie tot roken. Zelfidentiteit verwijst naar de percepties die een individu heeft van zichzelf als persoon en kan bijvoorbeeld zijn gebaseerd op bepaald gedrag. Een sterke roker zelfidentiteit betekent bijvoorbeeld dat het roken als gedrag belangrijk is voor hoe een roker zichzelf ziet. Rokers kunnen zich ook juist sterker identificeren met stoppen of niet-roken dan met roken, zodat zij het stoppen met roken of niet-roken juist vinden passen bij wie ze zijn. Bij groepsidentiteit gaat het om het gedeelte van identiteit dat is gebaseerd op het onderdeel zijn van bepaalde groepen. Zo identificeert een roker met een sterke rokers groepsidentiteit zich sterk met andere rokers en ziet zichzelf als onderdeel van deze groep. Op dezelfde manier als bij zelfidentiteit geldt hier dat rokers zich ook sterker kunnen identificeren met mensen die stoppen met roken, of met niet-rokers. Zelfidentiteit en groepsidentiteit definiëren gezamenlijk hoe rokers en ex-rokers zichzelf zien in relatie tot roken. Eerder onderzoek heeft laten zien dat identiteit belangrijk is voor rookgedrag en stoppen met roken. Ook bleek uit eerder onderzoek dat identiteit in de loop van de tijd kan veranderen onder rokers die stoppen met roken. Verschillende vragen bleven echter onbeantwoord in de bestaande literatuur. Deze vragen hebben geleid tot de studies die in deze dissertatie zijn gepresenteerd.

Ten eerste was onbekend wat het relatieve belang is van roker-, niet-roker en stopper[1] zelf- en groepsidentiteit voor rookgedrag, aangezien deze identiteiten nog niet gezamenlijk waren onderzocht. In hoofdstuk 2, 3, 5 en 6 is daarom onderzocht hoe verschillende identiteiten die relevant zijn voor roken het rookgedrag beïnvloeden (Onderzoeksvraag 1).

Ten tweede was het proces van identiteitsverandering -zowel voor als na een stoppoging- grotendeels onduidelijk. In de hoofdstukken 4 tot en met 7 is onderzocht hoe identiteit in de loop van de tijd verandert bij rokers en ex-rokers, zowel spontaan als door een interventie, en welke factoren identiteitsverandering beïnvloeden (Onderzoeksvraag 2).

Ten derde is het -gezien verschillen in rookgedrag en sociale omgeving tussen rokers met een lagere en hogere socio-economische status (SES)- aannemelijk dat identiteit in relatie tot roken verschilt op basis van SES. Er was echter weinig bekend over mogelijke effecten van SES op identiteitsprocessen, hoewel zulke effecten erg waarschijnlijk zijn. Met dit doel werd in hoofdstuk 2, 3, 6 en 7 onderzocht of de associaties tussen identiteit en rook gerelateerde uitkomsten, alsook processen van identiteitsverandering, verschillen tussen mensen met een lagere en hogere SES (Onderzoeksvraag 3).

In deze dissertatie werden verschillende onderzoeksmethoden gebruikt, bestaande uit cross-sectionele (één meetmoment) en longitudinale studies (meerdere meetmomenten in de tijd); observationele (geen interventie) en experimentele studies (wel een

1 Zelfperceptie als iemand die stopt met roken.

interventie); en kwantitatieve (vragenlijsten) alsook kwalitatieve methoden (interviews). Hoofdstuk 2 presenteerde de resultaten van een longitudinale vragenlijststudie met 1-jaar follow-up, waarin werd onderzocht of roker en niet-roker zelf- en groepsidentiteit en SES konden voorspellen of rokers van plan waren om te stoppen met roken (stopintentie), of zij een stoppoging ondernamen en hoe zij reageerden op het Nederlandse horecarookverbod. Hoofdstuk 3 liet de resultaten zien van een cross-sectionele studie waarin werd onderzocht hoe SES rookgedrag beïnvloedt, waarbij sociale steun en identiteitsfactoren werden bekeken. Vervolgens werd in hoofdstuk 4 een experimenteel onderzoek gepresenteerd waarin werd geprobeerd om de stopper zelfidentiteit te versterken door middel van een schrijfopdracht. Hoofdstuk 5 beschreef de resultaten van een longitudinaal kwalitatief (interview) onderzoek naar identiteitsverandering in het proces van stoppen met roken. De grootschalige longitudinale studie in hoofdstuk 6 onderzocht de wederzijdse relaties tussen identiteit, stopintentie en rookgedrag bij rokers en ex-rokers. Tenslotte werd in hoofdstuk 7 in dezelfde grootschalige longitudinale studie onderzocht hoe identiteit in de loop van de tijd verandert bij rokers en ex-rokers en of deze veranderingen kunnen worden voorspeld door SES en psychosociale factoren. De resultaten van deze studies worden hieronder samengevat.

Onderzoeksvraag 1: Hoe beïnvloeden verschillende identiteiten die relevant zijn voor roken het rookgedrag?

De studies die in deze dissertatie zijn gepresenteerd tonen duidelijk aan dat identiteit van belang is. In het algemeen kan worden gesteld dat de identiteit als niet-roker of stopper belangrijker is voor rookgedrag en stopgedrag dan de identiteit als roker. Hiernaast leken zelfidentiteiten belangrijker dan groepsidentiteiten. Identiteit voorspelde stopintenties, stoppogingen, stopsucces en reacties op het Nederlandse horecarookverbod, onafhankelijk van andere belangrijke factoren zoals nicotineafhankelijkheid en het aantal jaren dat iemand al rookt.

De resultaten van de kwantitatieve studies die van belang zijn voor deze onderzoeksvraag (Hoofdstuk 2, 3 en 6) lieten zien dat (gecontroleerd voor andere factoren die deze associaties zouden kunnen verklaren) rokers die zichzelf meer zien als niet-rokers of stoppers sterkere stopintenties hebben, meer geneigd zijn om een stoppoging te ondernemen en succesvol te stoppen en positiever reageren op het rookverbod. Rokersidentiteit was minder belangrijk en voorspelde enkel stopintenties in één studie (Hoofdstuk 3). Bovendien leek groepsidentiteit minder belangrijk te zijn dan zelfidentiteit, hoewel een sterkere identificatie met de groep van niet-rokers wel geassocieerd was met sterkere stopintenties in één studie (Hoofdstuk 3) en met sterkere positieve reacties en zwakkere negatieve reacties op het horecarookverbod in een andere studie (Hoofdstuk 2). Er werden geen effecten gevonden van rokers groepsidentiteit.

In lijn met deze kwantitatieve resultaten, die het belang van niet-roker en stopperidentiteit laten zien, suggereerden de resultaten van het kwalitatieve onderzoek (Hoofdstuk 5) dat rokers zichzelf moeten kunnen zien als niet-rokers om succesvol te kunnen stoppen. Met andere woorden, alleen die respondenten die zich identificeerden met niet-roken en zichzelf in de loop van de tijd steeds meer als niet-roker gingen zien, waren twee jaar later blijvend gestopt. Samengevat lieten de resultaten consistent zien dat niet-roker en stoppersidentiteiten relevanter zijn voor rookgedrag dan rokersidentiteiten.

Onderzoeksvraag 2: Hoe verandert identiteit?

Deze dissertatie liet bovendien zien dat identiteit verandert als gevolg van rookgedrag en sociale normen, en dat identiteitsverandering lijkt te worden gefaciliteerd door permeabele grenzen van identiteit, het gevoel dezelfde persoon te blijven (identiteitscontinuïteit) en het gevoel te kunnen stoppen met roken. Daarnaast bleek dat schrijfopdrachten gebruikt kunnen worden om identiteit te veranderen. Dit wordt hieronder uitgebreider toegelicht.

We vonden dat gedrag identiteit vormt (Hoofdstuk 6 en 7), zodat 'wie we zijn' gedeeltelijk is gebaseerd op 'wat we doen'. Rokers en ex-rokers die hoger scoorden op een 'stopsucces' variabele (lopend van een hoge rookfrequentie naar langduriger niet-roken) lieten een jaar later een sterkere stopper zelfidentiteit en een zwakkere rokers zelf- en groepsidentiteit zien. Verder bleek dat blijvende rokers zichzelf in de loop van de tijd steeds meer gingen zien als rokers, terwijl de identificatie met roken afnam onder ex-rokers die succesvol waren gestopt. Hiernaast gingen rokers en ex-rokers zichzelf in de loop van de tijd steeds meer zien als 'stoppers' als zij in hun sociale omgeving sterkere pro-stoppen sociale normen waarnamen (d.w.z. zij hadden de indruk dat de mensen in hun omgeving het op prijs stelden als/dat zij stopten met roken). Ex-rokers die sterkere pro-stoppen normen waarnamen identificeerden zich daarnaast in de loop van de tijd steeds minder met roken.

Het kwalitatieve onderzoek (Hoofdstuk 5) liet zien dat identiteitsverandering in de richting van een niet-rokersidentiteit gefaciliteerd lijkt te worden door permeabele grenzen van identiteit, een gevoel van identiteitscontinuïteit en het gevoel te kunnen stoppen. Degenen die langdurig stopten met roken -en een identiteitsverandering lieten zien- zagen identiteiten niet als duidelijk afgebakend (bijv. zij rookten terwijl ze zichzelf als 'niet een roker' zagen). Bovendien zagen zij zichzelf tijdens het veranderingsproces, in essentie, als dezelfde persoon (identiteitscontinuïteit). Hiernaast voelden zich trots op wat zij hadden bereikt en in staat om te stoppen met roken.

Tenslotte gaf de experimentele studie (Hoofdstuk 4) een eerste indicatie dat schrijfopdrachten kunnen worden gebruikt om de zelfidentiteit als stopper te versterken. Identificatie met stoppen met roken leek te zijn versterkt door een eenvoudige schrijf-

opdracht, hoewel het effect klein was en marginaal significant. Stopper zelfidentiteit was met name versterkt onder rokers die het stoppen met roken verbonden aan hun manier van leven en onder rokers die een 'stopper' wilden zijn om gezondheidsredenen of vanwege positieve aspecten van het stoppen met roken.

Onderzoeksvraag 3: Verschillen de associaties tussen identiteit en rook gerelateerde uitkomsten en processen van identiteitsverandering op basis van socio-economische status?

Deze dissertatie gaf het eerste bewijs voor SES-verschillen in de sterkte van aan roken gerelateerde identiteit (Hoofdstuk 2 en 7; Hoofdstuk 3 liet bijna geen identiteitsverschillen zien tussen de SES-groepen). Rokers en ex-rokers met een lagere SES zien zichzelf op een manier die stoppen met roken bemoeilijkt. Bovendien veranderen rokersidentiteiten en stoppersidentiteiten minder gemakkelijk bij rokers en ex-rokers met een lagere SES.

Specifiek lieten de resultaten zien dat lagere SES rokers zich in het algemeen sterker identificeren met roken en minder sterk met niet-roken dan rokers met midden - of hogere SES. Op dezelfde manier identificeren lagere SES ex-rokers zich sterker met roken dan midden SES ex-rokers, maar er werd geen verschil gevonden tussen lagere en hogere SES ex-rokers. Bovendien suggereerde een van de studies dat het verband tussen niet-roker zelfidentiteit en stopintentie sterker is bij lagere - dan hogere SES rokers. Met andere woorden, hoewel lagere SES rokers in het algemeen zwakkere stopintenties hebben dan hogere SES rokers, wordt hun stopintentie sterker als zij zich in sterkere mate identificeren met niet-roker. Deze bevinding werd echter niet gerepliceerd in Hoofdstuk 3 of 6.

Hiernaast vonden we dat identiteit minder gemakkelijk verandert in de richting van niet-roken bij rokers en ex-rokers met een lagere SES. Roker zelfidentiteit neemt in de loop van de tijd sneller toe bij lagere SES rokers (vs. hogere SES rokers) en roken blijft langer onderdeel van de identiteit van lagere SES ex-rokers (vs. hogere SES ex-rokers). Op dezelfde manier vinden lagere SES ex-rokers het moeilijker om zichzelf te zien als stoppers.

Conclusies en implicaties

Er kunnen drie conclusies worden getrokken op basis van de resultaten van de studies die in deze dissertatie zijn gepresenteerd. Ten eerste lieten de resultaten zien dat de identiteiten als niet-roker en stopper belangrijker zijn dan rokersidentiteiten voor stopintenties, stoppogingen, (lange termijn) stopsucces en reacties op het Nederlandse horecarookverbod. Hiernaast leken zelfidentiteiten belangrijker dan groepsidentiteiten. Ten tweede verandert identiteit als gevolg van rookgedrag en sociale normen en wordt identiteitsverandering gefaciliteerd door permeabele identiteitsgrenzen, identiteitscontinuïteit en het gevoel te kunnen stoppen met roken. Ten derde identificeren rokers

en ex-rokers met een lagere SES zich sterker met roken - en lagere SES rokers identificeren zich minder sterk met niet-roken - dan hogere SES rokers en ex-rokers. Bovendien verandert identiteit minder makkelijk bij mensen met een lagere SES.

Op basis van deze bevindingen raden wij aan dat identiteiten die geassocieerd zijn met 'nieuw gedrag', in dit geval de identiteit als niet-roker of stopper, worden geïncorporeerd in identiteitstheorieën en worden onderscheiden van huidige identiteiten, in dit geval de identiteit als roker. Ook moet onderzoek naar identiteit en roken zich meer gaan richten op de identiteit als stopper en niet-roker, naast de identiteit als roker. Bovendien volgt uit de resultaten van deze dissertatie dat er interventies moeten worden ontwikkeld die de identificatie met stoppen en niet-roken faciliteren bij rokers en ex-rokers, aangezien dit type interventies zeer waarschijnlijk zal bijdragen aan succesvol stoppen met roken. Toekomstig onderzoek moet er daarom naar streven dat deze nieuwe kennis over roken en identiteit wordt geïntegreerd in stoppen met roken interventies. Hoewel alle rokers baat kunnen hebben bij zulke identiteits-gebaseerde interventies, moeten inspanningen om de identificatie met niet-roken en stoppen te versterken in de eerste plaats worden gericht op rokers en ex-rokers met een lagere SES.

Samengevat heeft deze dissertatie laten zien dat 1) zelfidentiteit als niet-roker of stopper van belang is voor rookgedrag, 2) dat identiteit in relatie tot roken kan veranderen en 3) dat socio-economische status een belangrijke rol speelt in hoe rokers en ex-rokers zichzelf zien in relatie tot roken en in de verandering van hun identiteit in de loop van de tijd. Ik hoop dat deze dissertatie bijdraagt aan de ontwikkeling van identiteits-gebaseerde interventies die rokers die willen stoppen met roken zullen helpen om dit succesvol en blijvend te doen.

CHAPTER 11

DANKWOORD

Mijn proefschrift is af! Dat was niet gelukt zonder de hulp van een heleboel mensen.

Ten eerste wil ik graag iedereen bedanken die heeft meegedaan aan mijn onderzoek en eindeloos veel vragen heeft beantwoord over roken en hoe zij zichzelf zien. Zonder hen was dit proefschrift er niet geweest. In het bijzonder wil ik de mensen bedanken die hebben meegedaan aan het interviewonderzoek in hoofdstuk 5. Bedankt voor jullie tijd, eerlijkheid en openheid. De interviews met jullie waren een van de leukste dingen die ik voor mijn promotieonderzoek heb gedaan. Ik ben ook veel dank verschuldigd aan het International Tobacco Control Policy Evaluation Project voor het gebruik van hun geweldige dataset voor hoofdstuk 6 en 7.

Winnie en Colette, bedankt voor jullie aanmoediging, opbouwende kritiek, betrokkenheid, gezelligheid, enthousiasme, extreem snelle en goede feedback en de cappuccino's. Jullie dachten dat een kort en parttime promotietraject wel zou moeten kunnen, en dankzij jullie goede begeleiding is het inderdaad gelukt! Jullie zijn allebei op jullie eigen manier een voorbeeld voor mij van goede, gedreven onderzoekers en ik kan me geen betere begeleiders dan jullie voorstellen. Andrea, bedankt ook voor jouw aanmoediging en hulp bij de totstandkoming van mijn proefschrift en het vertrouwen dat je had in dit project.

Ik wil ook graag mijn andere co-auteurs bedanken, stuk voor stuk slimme mensen die met hun feedback de artikelen in mijn proefschrift beter hebben gemaakt. Bas, Arie en Marc, dank voor jullie nauwkeurigheid en stimulatie om verder te kijken dan puur de resultaten. Marjolein en Zsuzsa, ik wil jullie graag bedanken voor jullie hulp bij de statistische analyses voor hoofdstuk 6 en 7. Geoffrey, thank you for setting up the amazing International Tobacco Control Policy Evaluation Project, and for your help with the papers on this data. Eleni, thanks for having me in London and for your invaluable help with the qualitative study. It was great to work together in your hot office in summer 2015 and 2016. Robert, thank you for your enthusiasm and feedback. Ook wil ik graag de studenten bedanken die hebben mij geholpen met het onderzoek: Celine, Jasmijn, Larissa, Nina, Ramin en Sarah, bedankt voor het werk dat jullie hebben gedaan. Ik wil ook graag alle collega's op het aio-gangetje en daarbuiten bedanken voor de gezelligheid en het lotgenotencontact, in het bijzonder Anke en Melanie. Ik heb het erg leuk gevonden om onderdeel van de afdeling GMN te zijn.

Ik wil ook graag de kring van de Immanuelkerk bedanken, omdat jullie mij er telkens weer aan herinneren dat er veel meer is in dit leven dan werk en een proefschrift. En mijn lieve familie en vrienden, bedankt dat jullie er zijn. Hannah, Sifra, Zohra, Roos, Lotte, Anita, Manon, Mileen, Andrea, Lineke en Jurjen, Hilde en Bouke, bedankt voor jullie (soms al hele lange) vriendschap, voor de gezelligheid en goede gesprekken. Ik bof met mijn leuke schoonfamilie, bedankt dat jullie mij als nerd in de familie hebben geadopteerd. Lieve papa en mama, ik heb ontzettend veel geluk dat ik de liefste ouders ter wereld heb! Bedankt voor alle bagage die jullie mij hebben meegegeven om dit

te kunnen doen, niet te vergeten het mooie voorbeeld van de 'ijsjes' in de diepvries in Haren. Jullie hebben er nooit aan getwijfeld dat ik dit kon en hielden tegelijkertijd goed in de gaten dat ik me niet over de kop zou werken. Lieve Thessa, mijn superzus, ik ben trots op jou. Ik vind het onwijs leuk dat jij mijn zus bent én dat je met je filmsigaret op mijn proefschrift staat. Dankjewel voor je hulp om hier samen met Myrthe en Susanne een mooi proefschrift van te maken. Lieve Arend, tenslotte wil ik jou bedanken voor je liefde en nog zoveel meer. Dankjewel voor je steun tijdens mijn promotietraject, jij bent mijn rots in de branding. Ik hou ontzettend veel van je, zonder jou zou mijn leven maar saai en sleurig zijn.

CHAPTER 12

CURRICULUM VITAE

Eline Meijer was born on the 30th of June, 1990 in Leeuwarden. After completing secondary school at the Jan Arentsz Scholengemeenschap in Alkmaar in 2008, she moved to Leiden to study Psychology. During her bachelors, she participated in several honors classes, including the Honors Research Bachelor Project where she wrote her thesis on "Freezing reactions in PTSD-patients and patients with conversion disorder". She worked as a coach for adolescents with autism at Dok20, Leiden from 2011 to 2013. After obtaining her bachelor degree in 2011, she started with the Research Master Clinical and Health Psychology, from which she graduated Cum Laude in December 2013. During her masters, Eline worked as a KNAW-funded research assistant for Winnie Gebhardt and Colette van Laar. She also wrote her master thesis under their supervision, entitled "Quitting smoking: the importance of self identity and group identity for smoker subtypes". In addition to the Research Master courses, Eline participated in the courses of the Clinical Psychology master and did a clinical internship at the VALK foundation in Leiden, thereby fulfilling the requirements of the Clinical Psychology master. Eline commenced her PhD trajectory on smoking and identity at the Department of Health, Neuro and Medical Psychology of Leiden University in January 2014. She was also appointed as a junior researcher at a research project on academic achievement, and worked as a staff member and statistical advisor at the Faculty of Social Science Master Thesis Lab. She completed her PhD dissertation in three years, corresponding to one and a half year full time given the additional activities. In August 2016, Eline joined the Department of Public Health and Primary Care, Leiden University Medical Center where she works as a postdoctoral researcher. She develops an identity-based e-health intervention that builds upon the findings in her dissertation and she works on several other projects, including two projects that aim to investigate and improve the implementation of the Dutch tobacco dependence guideline. Aside from her research work, Eline takes part in the initial phase of the cognitive behavioral therapist training and works as a psychologist at the VALK foundation.

CHAPTER 13

LIST OF PUBLICATIONS AND PRESENTATIONS

Publications

Articles in peer reviewed journals

Chavannes, N. H., **Meijer, E.,** Wind, L., van der Graaf, R. C., Rietbergen, C., & Croes, E. A. (2017). Herziene richtlijn 'Behandeling van tabaksverslaving en stoppen met roken ondersteuning'. *Nederlands Tijdschrift voor Geneeskunde, 161*, 0.

Meijer, E., Gebhardt, W. A., Van Laar, C., Kawous, R., & Beijk, S. C. A. M. (2016). Socio-economic status in relation to smoking: The role of (expected and desired) social support and quitter identity. *Social Science & Medicine, 162,* 41-49.

Meijer, E., Gebhardt, W. A., Dijkstra, A., Willemsen, M. C., van Laar, C. (2015). Quitting smoking: the importance of non-smoker identity in predicting smoking behaviour and responses to a smoking ban. *Psychology & Health, 30*(12), 1387-1409.

Meijer, E., van Laar, C., Gebhardt, W. A., Fokkema, M., van den Putte, B., Dijkstra, A., ... & Willemsen, M. C. (2017). Identity change among smokers and ex-smokers: Findings from the ITC Netherlands Survey. *Psychology of Addictive Behaviors, 31*(4), 465.

Van Laar, C., Bleeker, D., Ellemers, N., & **Meijer, E.** (2014). Ingroup and outgroup support for upward mobility: Divergent responses to ingroup identification in low status groups. *European Journal of Social Psychology, 44,* 563-577.

Submitted

Kasteleyn, M. J., de Boer, E. M., **Meijer, E.,** de Kleijn, M. J. J., Prinssen, M., … & Chavannes, N. H. (2017). Effectiveness of the one-time smoking cessation group intervention 'I quit': A large-scale intervention at low costs. *Manuscript submitted for publication.*

Meijer, E., Cleiren, M. P. H. D., Dusseldorp, E., Buurman, V. J. C., Hogervorst, R. M., Heiser, W. J. (2017). Cross-validated prediction of academic performance of first year university students: Identifying risk-factors in a non-selective environment. *Manuscript resubmitted.*

Meijer, E., Gebhardt, W. A., Van Laar, C., Van den Putte, B., & Evers, A. W. M. (2017). Strengthening quitter self-identity and expected social support for quitting smoking: An experimental study. *Manuscript resubmitted.*

Meijer, E., Van den Putte, B., Gebhardt, W. A., Van Laar, C., Bakk, Z., Dijkstra, A., … & Willemsen, M. C. (2017). A longitudinal study into the reciprocal effects of identities and smoking behavior: Findings from the ITC Netherlands Survey. *Manuscript resubmitted.*

Meijer, E., Vangeli, E., Gebhardt, W. A., & Van Laar, C. (2017) Identity processes in smokers who want to quit smoking: A longitudinal interpretative phenomenological analysis. *Manuscript under review.*

Meijer, E., Verbiest, M. E. A., Chavannes, N. H., Kaptein, A. A., Assendelft, W. J. J., Scharloo, M., Crone, M. R. (2017). Smokers' identity and quit advice in general practice: General practitioners need to focus more on female smokers. *Manuscript resubmitted.*

Other

Meijer, E., Gebhardt, W.A., van Laar, C., Willemsen, M. & Dijkstra, A. (2013). Het belang van zelfidentiteit en groepsidentiteit als voorspellers van kernreacties op het horeca-rookverbod. *ASPO jaarboek 2013*, pp. 137-139.

Presentations

Meijer, E., Van der Kleij, M. J. J., Segaar, D., Chavannes, N. H. The DO-IT project: Optimizing the Implementation of the Tobacco Dependence Guideline using e-health applications. March 2017, 7th ECToH Conference on Tobacco or Health, Porto, Portugal (oral).

Meijer, E., Van der Kleij, M. J. J., Segaar, D., Chavannes, N. H. Het Do-it project: Whatsapp-berichten als middel om de implementatie van de Richtlijn Tabaksverslaving te optimaliseren. February 2017, Congres Nederlands Netwerk voor Tabaksonderzoekers, Utrecht, The Netherlands (oral).

Meijer, E., Van der Kleij, M. J. J., Segaar, D., Chavannes, N. H. Het DO-IT project: SMS-berichten als middel om de implementatie van de Richtlijn Tabaksverslaving te optimaliseren. January 2017, Congres COPD en Astma Huisartsen Advies Groep, Utrecht, The Netherlands (oral).

Meijer, E., Gebhardt, W. A., Van den Putte, B., Willemsen, M. C., De Vries, H., Fong, G. T., Dijkstra, A., West, R., Van Laar, C. Predicting changes in smoker identity and quitter identity among smokers and ex-smokers using ITC data. September 2015, 29th Conference of the EHPS: Principles of Behaviour Change in Health and Illness, Limassol, Cyprus (poster).

Meijer, E., Gebhardt, W. A., Kawous, R., Beijk, S. C. A. M., & Van Laar, C. Social support and identity factors are important for smoking behaviour in lower and higher socio-economic status groups. September 2015, 29th Conference of the EHPS: Principles of Behaviour Change in Health and Illness, Limassol, Cyprus (poster).

Meijer, E., Gebhardt, W. A., Kawous, R., Beijk, S. C. A. M., & Van Laar, C. Roken en sociaaleconomische status: Het belang van identiteit als voorspeller van stopintentie. March 2015, Congres Nederlands Netwerk voor Tabaksonderzoekers, Utrecht, The Netherlands (oral).

Meijer, E., Gebhardt, W. A., Van Laar, C., Willemsen, M. C., & Dijkstra, A. Reacting to the smoking ban: the importance of identity in predicting reactions. July 2014, General Meeting European Associations of Social Psychology, Amsterdam (poster).

Meijer, E., Gebhardt, W. A., Van Laar, C., Willemsen, M. C., & Dijkstra, A. Reacting to the smoking ban: the importance of identity in predicting reactions. February 2014, Third annual conference of the Association for Researchers in Psychology and Health, Groningen, The Netherlands (oral).

Meijer, E., Gebhardt, W. A., Van Laar, C., Willemsen, M. C., & Dijkstra, A. Het belang van zelfidentiteit en groepsidentiteit als voorspellers van kernreacties op het horecarookverbod. December 2013, Congres Associatie van Sociaalpsychologische Onderzoekers, Maastricht, The Netherlands (oral).

Meijer, E., Gebhardt, W. A., Van Laar, C., Willemsen, M. C., & Dijkstra, A. Quitting smoking: the importance of self- and group-identity for smoker subtypes. January/February 2013, Second annual conference of the Association for Researchers in Psychology and Health, Enschede, The Netherlands (poster).