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Socio-economic status in relation to smoking: The role of (expected and desired) social support and quitter identity

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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.

1. Introduction

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., Fernandez et al., 2006; Pisinger et al., 2011; Reid et al., 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 et al., 2002). Meanwhile, receiving social

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support for quitting is associated with stronger quit-intentions and self-efficacy, adaptive coping and quit-success (e.g., Hooper et al., 2013; Rayens et al., 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 et al., 2009; Rice et al., 1996; Roski et al., 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 and Fowler, 2008; Royce et al., 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—social identity (Tajfel and Turner, 1979). People are more inclined to provide social support to someone with whom they socially identify, and recipients of social support seem to benefit more from this support when they share identity with the support provider (Haslam et al., 2012; Walsh et al., 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 et al., 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 and 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 et al., 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 et al., 2010). Regarding social identities in recovery from addiction, the Social Identity Model of Cessation Maintenance (SIMCM; Frings and 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 et al., 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 et al., 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 and 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 et al., 2010; Meijer et al., 2015; Moan and Rise, 2005, 2006; Van den Putte et al., 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 and 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 and 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).

2. Method

2.1. 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 over-represented (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).

2.2. Predictor variables

2.2.1. Demographics

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

2.2.2. 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).

2.2.3. Nicotine-dependence

Nicotine-dependence was measured with the six-item Fagerström Test for Nicotine Dependence (FTND; Heatherton et al., 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.

2.2.4. Expected social support

Based on the 20-item Partner Interaction Questionnaire (PIQ; Cohen and 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 Online Supplement 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', α = 0.88), positive support (seven items, e.g., 'Compliment me on not smoking', α = 0.88), and practical support (five items, e.g., 'Participate in an activity that keeps me from smoking', α = 0.88; see Online Supplement B).

2.2.5. 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.

2.2.5.1. Smoker self-identity. We used the five-item Smoker Self-Concept Scale to measure smoker self-identity (α = 0.85), e.g., 'Smoking is part of "who I am"' (Shadel and Mermelstein, 1996). We added 'I like being a smoker' (adapted from Tombor et al., 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). Higher scores indicate more of the concept assessed, as with all the other scales.

2.2.5.2. Nonsmoker self-identity. We used the four-item Abstainer Self-Concept Scale to measure nonsmoker self-identity (α = 0.87), e.g., 'I am able to see myself as a nonsmoker' (Shadel and 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 and 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).

2.2.5.3. Quitter self-identity. We adapted the four-item Abstainer Self-Concept Scale (Shadel and Mermelstein, 1996) to measure *quitter self-identity* (α = 0.85), 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.

2.2.5.4. 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', $\alpha = 0.67$), *centrality* (e.g., 'The fact that I am part of the group of smokers rarely enters my mind' (reversed), $\alpha = 0.67$) and *ingroup affect* (e.g., 'In general, I am glad that I am part of the group of smokers', $\alpha = 0.78$) 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, $\alpha = 0.62$).

2.2.5.5. Nonsmoker group-identity. Similarly, we measured *nonsmoker group ties* ($\alpha = 0.71$), *centrality* ($\alpha = 0.73$), and *group affect* ($\alpha = 0.73$) 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, $\alpha = 0.63$).

2.2.5.6. Quitter group-identity. Similarly, we measured *quitter group ties* ($\alpha = 0.68$), *centrality* ($\alpha = 0.79$), and *group affect* ($\alpha = 0.73$) 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, $\alpha = 0.53$).

2.3. Outcome variables

2.3.1. Expected social support

See 'Predictor variables'.

2.3.2. 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.

2.3.3. 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'.

2.3.4. Expected exclusion

Three items measured expected exclusion from the social network after quitting ($\alpha = 0.75$); that is, '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.

2.3.5. 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 et al., 1997). This variable was recoded, such that higher scores indicated stronger quit-intention.

2.4. 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 (Hayes, 2013) 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', $r = 0.95$, $p < 0.001$) 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).

3. Results

3.1. 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.

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.

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

Characteristic		Frequency (Expected count)/M (SD)			Chi-square test
		Lower-SES (n = 71–74)	Middle-SES (n = 115–121)	Higher-SES (n = 186–192)	
Gender	Male	28 (28)	43 (45)	74 (72)	χ^2 (2) = 0.29, p = 0.86, V = 0.03
	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**

$^+p < 0.10$; $^*p < 0.05$; $^{**}p < 0.01$.

Table 2
Correlations between variables used in the regression analyses (*Ns* = 372–387).

Variable	1	2	3	4	5	6	7	8	9	10
1. Quit-intention	1									
2. Gender (female)	0.16**	1								
3. SES (lower)[a]	0.00	0.00	1							
4. SES (middle)[a]	0.01	0.03	−0.33**	1						
5. Age at smoking onset	−0.01	−0.02	−0.06	−0.09	1					
6. Years smoked	−0.36**	−0.13*	0.17**	−0.24**	−0.14**	1				
7. Nicotine-dependence	−0.07	−0.03	0.19**	0.02	−0.22**	0.31**	1			
8. Expected positive support	0.11*	0.03	0.01	0.05	−0.06	−0.04	0.12*	1		
9. Expected negative support	0.03	−0.06	0.15**	−0.05	−0.05	0.16**	0.15**	0.50**	1	
10. Expected practical support	0.07	0.05	0.12*	0.02	−0.08	0.01	0.13*	0.64**	0.42**	1
11. Smoker self-identity	−0.41**	−0.14**	0.08	−0.02	−0.08	0.23**	0.18**	−0.02	0.05	−0.02
12. Nonsmoker self-identity	0.58**	0.10$^+$	−0.07	0.01	0.06	−0.31**	−0.12*	0.16**	0.03	0.08
13. Quitter self-identity	0.62**	0.06	−0.02	−0.03	0.04	−0.28**	−0.07	0.20**	0.07	0.10*
14. Smoker group-identity ties	0.01	−0.05	−0.12*	0.06	−0.03	−0.18**	0.12*	0.07	0.01	0.02
15. Smoker group-identity centrality	0.07	0.03	0.03	−0.04	0.05	0.13*	0.14**	0.00	0.15**	0.03
16. Smoker group-identity affect	−0.34**	−0.20**	−0.05	0.08$^+$	0.07	−0.10*	−0.11*	−0.09$^+$	−0.12*	−0.04
17. Nonsmoker group-identity ties	0.14**	0.08	−0.11*	0.04	0.14**	−0.16**	−0.17**	0.07	−0.07	−0.06
18. Nonsmoker group-identity centrality	0.20**	0.18**	0.12*	−0.06	0.04	0.11*	0.07	0.04	0.19**	0.05
19. Nonsmoker group-identity affect	0.46**	0.20**	−0.04	−0.05	0.01	−0.13**	0.03	0.13**	0.06	0.04
20. Quitter group-identity ties	0.27**	0.05	0.09$^+$	−0.01	0.03	−0.03	0.00	0.12*	0.06	0.07
21. Quitter group-identity centrality	0.25**	0.09$^+$	0.15**	−0.01	0.00	0.05	0.06	0.04	0.18**	0.04
22. Quitter group-identity affect	0.45**	0.22**	0.01	0.00	−0.04	−0.08	0.10*	0.16**	0.09$^+$	0.04

Variable	11	12	13	14	15	16	17	18	19	20	21
11. Smoker self-identity	1										
12. Nonsmoker self-identity	−0.52**	1									
13. Quitter self-identity	−0.40**	0.83**	1								
14. Smoker group-identity ties	0.29**	−0.11*	−0.05	1							
15. Smoker group-identity centrality	0.13*	−0.01	0.05	0.21**	1						
16. Smoker group-identity affect	0.43**	−0.45**	−0.37**	0.29**	−0.12*	1					
17. Nonsmoker group-identity ties	−0.25**	0.30**	0.23**	−0.06	−0.03	−0.16**	1				
18. Nonsmoker group-identity centrality	−0.10	0.23**	0.24**	0.01	0.55**	−0.36**	0.02	1			
19. Nonsmoker group-identity affect	−0.41**	0.54**	0.46**	−0.07	0.10$^+$	−0.58**	0.32**	0.27**	1		
20. Quitter group-identity ties	−0.22**	0.34**	0.35**	0.00	0.09$^+$	−0.23**	0.41**	0.20**	0.30**	1	
21. Quitter group-identity centrality	−0.08	0.30**	0.32**	0.01	0.44**	−0.37**	0.05	0.71**	0.28**	0.30**	1
22. Quitter group-identity affect	−0.41**	0.55**	0.52**	−0.10*	0.12*	−0.58**	0.28**	0.26**	0.75**	0.37**	0.32**

$^+p < 0.10$; $^*p < 0.05$; $^{**}p < 0.01$.
[a] Compared with the reference category 'higher-SES'.

3.2. Social support and the social network (RQ1)

3.2.1. 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, $F(2,364) = 2.41$, $p = 0.09$, $\eta_p^2 = 0.01$ (η_p^2 = partial eta squared; see Table 3). However, lower-SES smokers also expected marginally more practical support than higher-SES smokers, $F(2,364) = 2.63$, $p = 0.07$, $\eta_p^2 = 0.01$. No significant group-differences in expected positive support were found, $F(2,364) = 0.17$, $p = 0.84$, $\eta_p^2 < 0.01$. The hypothesis that lower-SES smokers expect less positive and practical support was not confirmed.

3.2.2. 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, $F(2,364) = 9.66$, $p < 0.001$, $\eta_p^2 = 0.05$ (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, $F(2,364) = 5.05$, $p < 0.01$, $\eta_p^2 = 0.03$.

3.2.3. Expected exclusion (RQ1c)

Unexpectedly, we found no significant differences between SES-groups in expected exclusion when quitting smoking, $F(2,380) = 0.02$, $p = 0.98$, $\eta_p^2 < 0.01$(see Table 3). Overall, expected exclusion was low. The hypothesis that lower-SES smokers expect

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

Outcome		Mean (Standard deviation)			Estimated marginal means	Covariates: *b(SE)*		
		Lower-SES (ns = 71–74)	Middle-SES (ns = 113–119)	Higher-SES (ns = 186–192)		Age at smoking onset	Years smoked	Nicotine-dependence
Expected social support	Positive	3.61(0.74)	3.64(0.60)	3.56(0.7)	*ns*	−0.01(0.01)	0.00(0.002)	0.03(0.02)*
	Negative	3.16(0.75)	2.84(0.79)	2.85(0.80)	Lower > Higher+	0.00(0.01)	0.01(0.003)*	0.03(0.02)
	Practical	3.01(0.94)	2.83(0.83)	2.68(0.83)	Lower > Higher+	−0.01(0.01)	0.00(0.003)	0.04(0.02)+
Social network	Smokers	3.54(1.57)	4.34(1.47)	3.37(1.49)	Middle > Higher**	−0.05(.02)**	−0.05(0.004)**	0.04(0.03)
	Nonsmokers	4.75(1.22)	4.34(1.32)	5.17(1.16)	Higher > Lower* Higher > Middle**	0.03(0.02)+	0.02(0.004)**	−0.03(0.03)
Expected exclusion[a]		1.55(0.86)	1.59(0.82)	1.57(0.87)	*ns*	−0.01(0.01)	0.00(0.003)	
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)	*ns*	0.00(0.01)	0.01(0.003)**	0.03(0.02)+
Nonsmoker self-identity[b]		3.02(0.92)	3.14(0.75)	3.13(0.78)	*ns*	0.01(0.01)	–	−0.03(0.02)+
Quitter self-identity[b]		3.00(0.92)	3.00(0.81)	3.02(0.76)	*ns*	0.00(0.01)	–	−0.02(0.02)
Smoker group-identity	Ties	3.05(0.58)	3.30(0.67)	3.27(0.68)	Higher > Lower*	0.00(0.01)	−0.01(0.002)**	0.06(0.02)**
	Centrality[a]	2.46(0.57)	2.37(0.78)	2.43(0.81)	*ns*	0.01(0.01)	0.01(0.002)**	–
	Affect	2.64(0.82)	2.83(0.73)	2.69(0.86)	*ns*	0.01(0.01)	0.00(0.002)	
Nonsmoker group-identity	Ties	3.07(0.72)	3.30(0.60)	3.27(0.68)	*ns*	0.02(0.01)+	0.00(0.002)*	−0.03(0.02)+
	Centrality	2.62(0.64)	2.34(0.78)	2.40(0.82)	*ns*	0.01(0.01)	0.00(0.003)	0.01(0.02)
	Affect	3.48(0.83)	3.50(0.62)	3.60(0.75)	*ns*	0.00(0.01)	−0.01(0.002)**	0.04(0.02)*
Quitter group-identity	Ties	3.08(0.63)	2.97(0.66)	2.94(0.71)	*ns*	0.01(0.01)	0.00(0.002)	0.00(0.02)
	Centrality[b]	2.69(0.67)	2.42(0.78)	2.36(0.83)	Lower > Higher*	0.01(0.01)	–	0.01(0.02)
	Affect[b]	3.52(0.82)	3.50(0.67)	3.52(0.72)	*ns*	0.00(0.01)		0.03(0.02)+
Quit-intention[a]		4.89(2.51)	5.03(1.91)	4.82(2.39)	*ns*	−0.02(0.03)	–	−0.08(0.15)

Note. Kruskal-Wallis tests were used for desired support. *ns* = non-significant.
+$p < 0.10$; *$p < 0.05$; **$p < 0.01$.
[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.

more exclusion was not confirmed.

3.2.4. 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.

3.3. Desired social support for quitting smoking (RQ2)

We found no significant group-differences in desire for positive ($H(2) = 1.38$, $p = 0.50$), negative ($H(2) = 0.49$, $p = 0.79$) and practical support ($H(2) = 2.93$, $p = 0.23$; see Table 3). Across SES-groups, positive support items were selected most and negative support items were selected least (see Online Supplement A for counts).

3.4. Identity (RQ3)

Unexpectedly, higher-SES smokers had stronger ties with smokers than lower-SES smokers, $F(2,364) = 3.95$, $p = 0.02$, $\eta_p^2 = 0.02$ (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 $ps > 0.10$). The hypotheses about SES differences in identity were not confirmed.

3.5. 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-

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

	Predictor	b (SE)	β
Step 1	SES (lower)[a]	0.22 (0.30)	0.04
	SES (middle)[a]	−0.31 (0.26)	−0.06
	Gender (female)	0.62 (0.23)**	0.13**
	Age at smoking onset	−0.04 (0.03)	−0.07
	Years smoked	−0.05 (0.01)**	−0.40**
	Nicotine-dependence	0.04 (0.05)	0.04
Step 2A	Expected negative support	0.15 (0.16)	0.05
	Expected positive support	0.40 (0.22)+	0.12+
	Expected practical support	−0.12 (0.17)	−0.05
Step 2B	Smoker self-identity	−0.36 (0.15)*	−0.12*
	Nonsmoker self-identity	0.18 (0.22)	0.06
	Quitter self-identity	0.96 (0.21)**	0.34**
	Smoker group-identity ties	0.21 (0.15)	0.06
	Smoker group-identity centrality	0.16 (0.15)	0.05
	Smoker group-identity affect	−0.08 (0.16)	−0.03
	Nonsmoker group-identity ties	−0.40 (0.16)*	−0.12*
	Nonsmoker group-identity centrality	−0.09 (0.18)	−0.03
	Nonsmoker group-identity affect	0.42 (0.19)*	0.13*
	Quitter group-identity ties	0.25 (0.16)	0.07
	Quitter group-identity centrality	0.10 (0.17)	0.04
	Quitter group-identity affect	0.14 (0.21)	0.05

Note. $R^2 = 0.17$ ($p < 0.001$) for Step 1; $\Delta R^2 = 0.02$ for Step 2A ($p = 0.06$); $\Delta R^2 = 0.32$ for Step 2B ($p < 0.001$).
+$p < 0.10$; *$p < 0.05$; **$p < 0.01$
[a] Compared with reference category 'higher-SES'.

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 $\Delta R^2 < 0.01$, $p = 0.86$) or identity concepts and SES (RQ5b; Step 3B $\Delta R^2 = 0.01$, $p = 0.88$; interactions all $ps > 0.18$; 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 ($\beta = 0.12$, $p = 0.01$). 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 ($\beta = 0.08$, $p = 0.11$), suggesting that the contrary effect emerged because of suppression. Results held also when sample source was entered into the model.

4. 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 et al. (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 (cf. 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 and Butler, 2011). Finally, correlations between identity and support corresponded with work suggesting that support may shape identity (e.g., Frings and Albery, 2015), and that *perceptions* of the social environment also contribute to identity (Asencio and Burke, 2011). In addition, identity may affect perceptions of others (Derks et al., 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 and 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 (see Vangeli and 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 and 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 (cf. Ellemers et al., 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), here we 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 and 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).

4.1. 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 (see Schaap et al., 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 and 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.

5. 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.

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Conflict of interest

The authors declare that they have no conflicts of interest.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.socscimed.2016.06.022.

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