



Published in final edited form as:

Psychol Addict Behav. 2016 June ; 30(4): 475–483. doi:10.1037/adb0000171.

Smoker Identity Development among Adolescents who Smoke

Andrew W. Hertel, Ph.D. and

Department of Psychology, Knox College

Robin J. Mermelstein, Ph.D.

Department of Psychology and Institute for Health Research and Policy, University of Illinois at Chicago

Abstract

Adolescents who smoke are more likely to escalate their smoking frequency if they believe smoking is self-defining. Knowing factors that are associated with development of a smoker identity among adolescents who smoke may help to identify who will become a regular smoker. We investigated whether smoker identity development is associated with internal and external motives for smoking. For comparison, we also investigated whether social smoker identity development is associated with internal and external motives for smoking. Adolescents who smoke ($n = 292$) completed measures of smoker and social smoker identity, internal motives for smoking (negative affect coping, positive affect enhancement), and external motives for smoking (social fit) at baseline, 6-, 15-, and 24-month assessments of an ongoing longitudinal study of smoking patterns. We examined whether change in smoker and social smoker identity from 6 to 24 months was associated with change in motives at earlier assessment waves. We also explored whether gender moderated these relationships. Increases in negative affect coping motives were associated with smoker identity development among both males and females. Increases in social motives were associated with smoker identity development among males, and increases in negative affect coping motives were associated with social smoker identity development among females. Smoker and social smoker identities are signaled by negative affect coping as well as social motives for smoking.

Keywords

adolescent smoking; smoker identity; social smoker identity; smoking motives; self-perception theory

Adolescents who smoke and come to believe that smoking is not merely a behavior they enact, but a behavior that defines who they are (“I smoke cigarettes” versus “I am a smoker”), more rapidly escalate their smoking frequency (Hertel & Mermelstein, 2012). Gaining an understanding of what is associated with smoker identity¹ development could shed light on why adolescents who smoke develop into regular smokers. Drawing on social

Correspondence concerning this article should be addressed to Andrew W. Hertel, Knox College, 2 East South Street, Galesburg, IL, 61401. awhertel@knox.edu.

¹Depending on theoretical perspective, the belief that a behavior helps to define oneself has been referred to as identity (e.g., sociological role-identity theory), self-concept [cognitive-behavioral theory (e.g., Leventhal & Cleary, 1980); social-cognitive theory

psychological theory of self-perception and evidence accumulated to date regarding development of behavior-specific identities, we examined the extent to which smoker identity development is associated with internal and external motives for smoking.

Smoking Motives and Smoker Identity

Imagine two adolescent smokers. Smoker A and Smoker B have experimented with smoking for the same amount of time and smoke a similar number of cigarettes at a similar rate. Neither will necessarily identify as a smoker merely because of having smoked; many who smoke do not identify as smokers (Levinson et al., 2007; Ridner, Walker, Hart, & Myers, 2010). However, Smoker A and B differ in the motives they have for smoking. Whereas Smoker A smokes when he wants to calm down after having a difficult day at school, Smoker B smokes to fit in with her friends when they are smoking. Is one of these adolescents more likely than the other to develop an identity as a smoker?

According to Self-Perception Theory (Bem, 1972), an individual develops the self-perception that a behavior is self-defining the more the individual and the less the environment is the focal point for the behavior. For instance, behavior can be attributed to either internal or external causes. Internal causal attributions reflect the belief that the behavior is caused by the individual, whereas external causal attributions reflect the belief that the behavior is caused by the environment. The more there are internal attributions for a behavior and the less there are external attributions for a behavior, the more likely the behavior is considered self-defining. Like attributions, behavioral motives can be classified as internal or external (e.g., Cooper, 1994). Internal motives are associated with inward-directed, self-focused outcomes, such as emotion regulation. External motives are associated with outward-directed, external-focused outcomes, such as the desire to get along with others. The belief that a behavior is self-defining is also likely to develop the more there are internal and the less there are external motives for that behavior.

Thus, an identity as a smoker might develop the more there are internal motives for smoking and the less there are external motives for smoking. Returning to the two adolescent smokers, Smoker A, who has internal motives for smoking (i.e., mood regulation), will be more likely to develop a smoker identity than Smoker B, who has external motives for smoking (i.e., fitting in socially).

Evidence to date from research on smoking and other health behaviors supports the notion that internal motives for smoking are associated with smoker identity development. The clearest example of this to date comes from research on drinking alcohol. People who drink are more likely to have a drinker identity the more strongly they hold positive affect enhancement motives and negative affect coping motives for drinking (Foster, 2014; Lindgren, Neighbors, Wiers, Gasser, & Teachman, 2015). Direct evidence also comes from research on exercise. People who exercise are more likely to have an exerciser identity the more strongly they believe that they will experience positive affect when they exercise (de

(Shadel & Mermelstein, 1996)], and self-schema (e.g., social-cognitive theory (Shadel & Mermelstein, 1996; Kendzierski & Whitaker, 1997). Regardless of theoretical perspective, it is typically operationalized as endorsement that behavior has meaning for the self. Here, we agnostically use the term identity, as this has been used most often in the literature.

Bruijn, Verkooijen, de Vries, & van den Putte, 2012), and the more strongly they believe that they exercise in order to satisfy their personal desire to exercise (Kendzierski, Furr, & Schiavoni, 1998; Kendzierski & Morganstein, 2009). Indirect evidence comes from research on smoking. Smoker identity is associated mostly with regular, as opposed to experimental, smoking (Hertel & Mermelstein, 2012), and regular smoking is strongly associated with internal motives for smoking such as smoking to redress cravings (Shadel, Shiffman, Niaura, Nichter, & Abrams, 2000), labile emotions (Kassel, Stroud, & Paronis, 2003), and negative affect (Baker, Piper, McCarthy, Majeskie, & Fiore, 2004). Moreover, adolescents are more likely to self-identify as smokers the more strongly they perceive that they are addicted to smoking (Mermelstein, 1999), which is thought of as indicating internal motives for smoking (Berg et al., 2013; Chassin, Presson, Rose, & Sherman, 2007). Taken together, results from research on smoking and other health behaviors point to the possibility that internal motives for smoking are associated with the development of a smoker identity.

Evidence of the notion that smoker identity is inhibited by external motives for smoking is less consistent. Research to date has primarily focused on social motives, an important yet specific type of external motive. Interestingly, research on drinking alcohol has demonstrated that people are more likely to have a drinker identity the more strongly they have social motives for drinking (Foster, 2014; Lindgren et al., 2015). This finding is consistent with the research demonstrating that behaviors that bring about positive evaluations of the self by others are incorporated into the self-concept (Schlenker, 1986; Schlenker & Pontari, 2000), and that people adopt self-beliefs that are associated with positive evaluations of the self by others. For instance, people are more likely to display affiliation with successful groups (Cialdini et al., 1976) and are more likely to define themselves as being part of an in-group the more positively that in-group is defined (Tajfel & Turner, 1986). Thus, in contrast to the Self-Perception Theory (Bem, 1972) perspective, a smoker identity may be more likely to develop the stronger the social motives are for smoking. However, experimental smoking is primarily influenced by social motives for smoking (Kobus, 2003), and a smoker identity may not develop until after this stage of smoking. One thing to consider is that participants in Foster (2014) and Lindgren et al. (2015) did not strongly identify as drinkers, and so identification of the correlates of drinker identity may have been constrained. Thus, the relationship between external motives for smoking namely, social motives for smoking – and smoker identity development remains an open question.

Social Smoker Identity

Thus far, we have discussed a smoker identity, which reflects the belief that smoking is self-defining. However, some who have experimented with smoking develop the self-perception of being a *social* smoker (Levinson et al., 2007; Shadel & Mermelstein, 1996; Song & Ling, 2011). These individuals maintain the belief that their smoking is limited to social situations. This belief is likely the result of persistent social motives for smoking. Again returning to the two adolescent smokers, one would thereby predict that Smoker B, who has social motives for smoking, would be more likely to develop a social smoker identity than Smoker A, who has internal motives for smoking. In Foster (2014) and Lindgren et al. (2015), relatively weak identification as a drinker may have indicated identification as a social

drinker rather than a drinker, and this may have been why social motives were observed to be correlates.

Current Study

In the current study, we examined whether internal and external motives for smoking are associated with smoker and social smoker identity development. As in previous research, we focused only on the social motives class of external motives. Given theory and prior evidence, we specifically tested the hypothesis that increases in internal motives are associated with development of smoker identity, and we explored whether smoker identity development is also associated with changes in social motives. In addition, we tested whether increases in social motives are associated with development of a social smoker identity, and we explored whether social smoker identity development is also associated with changes in internal motives. Given potential gender differences in smoking rate (Johnson et al., 2015), smoking motives (Piko, Wills, & Walker, 2007), and smoker identity (Okoli, Torchalla, Ratner, & Johnson, 2011), we also explored whether gender moderated any of the relationships between smoking motives and smoker identity.

Methods

Design, Participant Recruitment and Description, and Procedure

Data for the current investigation come from the baseline (BL), 6-, 15-, and 24-month paper-and-pencil questionnaires of a large ongoing longitudinal study of the socio-emotional factors of smoking patterns from adolescence into young adulthood.² Participants were recruited from 9th and 10th grades at Chicago-area high schools. Adolescents were enrolled in the study if they agreed to participate in all components of the larger study [multiple longitudinal questionnaire assessments, ecological momentary assessments (e.g., Mermelstein, Hedeker, & Weinstein, 2009), family observation (e.g., Wakschlag et al., 2011), and psychophysiological laboratory assessments (e.g., Veilleux et al., 2011)] and if they both assented and had parental consent. We conducted the current investigation only among the 292 participants who indicated that they had smoked at least one cigarette in the past 6 months at each of the four assessments in order to readily observe growth in smoker identity among those who smoke and to ensure validity of responses to our ongoing smoking experience measures. These participants had a mean age of 15.7 years ($SD = .62$); 57.5% female; 65.1% white; 17.8% Hispanic, 7.9% black, 2.7% Asian or Pacific Islander, 0.3% American Indian or Alaskan Native, and 6.2% “other.”

Participants were paid \$20 for each of the first three assessments and \$40 for the fourth assessment. All study procedures were approved by the University of Illinois at Chicago Institutional Review Board.

Measures

Each of the following variables was measured at all four time points.

²The report of the association between smoker identity and smoking escalation (Hertel & Mermelstein, 2012) was also based on data from this study.

Smoker identity and social smoker identity—Participants indicated the extent to which they identified as a smoker with both a continuous and a categorical measure and the extent to which they saw themselves as social smokers with the categorical measure. With the continuous measure, participants answered the following two questions on continuous response scales: “How much is being a smoker part of who you are?” 1 (not at all) to 4 (a lot); “How important are cigarettes in your life?” 1 (not at all important) to 5 (the most important). The first item comes from Shadel and Mermelstein (1996). The second item was rationally derived. Responses for each item were standardized, and then responses were averaged to yield a composite index of smoker identity, with higher scores reflecting a stronger smoker identity (internal consistency reliability at baseline $r = .67$, 6-months $r = .68$, 15-months $r = .72$, 24-months $r = .61$). With the categorical measure, participants answered the question, “Which of the following best describes how you think about yourself?” with one of five categorical response options including Smoker, Social smoker/ Occasional smoker, Ex-smoker, Someone who tried smoking, and Non-smoker.

Both types of measures have been employed in studies on smoker identity (e.g., Hertel & Mermelstein, 2012; Levinson et al., 2007; Ridner et al., 2010). The categorical measure was unique compared to other categorical measures of smoker identity used in the literature to date (e.g., Levinson et al., 2007), as it included multiple response categories that distinguished between different smoking-related identities. The measure allowed us to separately assess smoker identity and social smoker identity.

Responses on the continuous and categorical measures were strongly related (Table 1). We conducted ANOVAs to assess mean differences in continuous response as a function of categorical response. At all assessments, there were significant mean differences in continuous responses as a function of categorical responses. Mean differences were linear, with mean continuous responses being highest for those who indicated having a smoker identity with the categorical measure. Planned contrast analyses revealed that mean continuous responses were higher for those who indicated having a smoker identity versus either a social smoker, ex-smoker, non-smoker, or trier identity. In addition, planned contrast analyses revealed that mean continuous responses were higher for those who indicated having a social smoker identity versus an ex-smoker, non-smoker, or trier identity. Mean continuous responses consistently did not differ between those who indicated having an ex-smoker, non-smoker, or trier identity. Given this, we collapsed ex-smoker, non-smoker, or trier identity responses categories together such that overall we considered three different categories of smoking-related identities including smoker identity, social smoker identity, and ex-smoker/non-smoker/trier identity. For ease of communication, we refer to the last category as the “non-smoker” category through the remainder of the manuscript.

Smoking motives—Smoking motives were assessed with eleven items of the Wills Tobacco Motives Inventory (Wills, Sandy, & Shinar, 1999) representing social reward motives (1 item: “Smoking makes it easier to be sociable with others”), social conformity motives (1 item: “Smoking helps you fit in with other people”), positive affect enhancement motives (3 items: “Smoking makes you feel more energetic,” “Smoking helps you concentrate on things,” and “Smoking makes you feel more sure of yourself”) and negative affect coping motives (6 items: “Smoking is something to do when you’re bored,” “Smoking

helps you forget about worries,” “Smoking helps you calm down when you’re feeling tense and nervous,” “Smoking helps you when you’re feeling angry,” “Smoking makes you feel more relaxed,” and “Smoking cheers you up when you’re in a bad mood”). The items were answered on 5-point scales ranging from 1 (not at all true) to 5 (very true). Exploratory factor analyses of the items using the principal axis factoring method with direct oblimin rotation consistently revealed the same three unique factors at all assessments. The social reward and social conformity motives for smoking items comprised one factor (“social motives”)(r^2 s at BL = .64, at 6-months = .71, at 15-months = .70, at 24-months = .76). The other two factors were comprised of the positive affect enhancement motives for smoking items (“enhancement motives”)(Cronbach’s α at BL = .73, at 6-months = .79, at 15-months = .74, at 24-months = .74) and negative affect coping motives for smoking items (“coping motives”)(Cronbach’s α at BL = .88, at 6-months = .88, at 15-months = .88, at 24-months = .87). Factors were moderately to strongly correlated with each other. Correlations between all factors at each assessment ranged from $r = .27$ to $r = .51$ (see Table 4 for correlations at BL). Of the three factors, enhancement and coping motives were most strongly correlated. Consistent with Cooper (1994), enhancement and coping motives were considered to represent internal motives for smoking.

Smoking behavior—Participants reported the number of days they smoked in the past 30 days by selecting one of nine categories (0, 1, 2–3, 4–5, 6–7, 8–10, 11–20, 21–29, or 30 days). Responses were re-coded to the midpoints of each of the categories (0, 1, 2.5, 4.5, 6.5, 9, 15.5, 25, 30). In addition, participants reported the number of cigarettes they smoked on each of the days that they smoked in the past 30 days by selecting one of eleven categories (0, < 1, 1, 2, 3, 4, 5, 6–10, 11–19, 20, >20). These responses were also re-coded to the midpoints of each of the categories (0, 0.5, 1, 2, 3, 4, 5, 8, 15, 20, 25). These two variables were multiplied together and then divided by 30 to produce a variable that reflected daily smoking rate over the past 30 days. Daily smoking rate over the past 30 days was controlled for in all analyses.

Analytic Plan—We conducted prospective mixed model growth analyses by lagging identity at times $t+1$ (6-months through 24-months) onto coping motives, enhancement motives, and social motives at times t (BL through 15-months). Thus, we examined whether changes in identity were associated with previous changes in smoking motives, as opposed to just motives at a single point in time. For these analyses, survey assessment time point was linearly coded such that there was a match between times t and times $t+1$ (times t BL = 0, 6-months = 1, and 15-months = 2.5; times $t+1$ 6-months = 0, 15-months = 1, and 24-months = 2.5). In all analyses we controlled for survey assessment time point and smoking rate at the previous time points. Identity at the previous time point was not controlled for as doing so would have amounted to testing autocorrelation models and would have resulted in biased estimates of the predictor coefficients (see Duckworth, Tsukayama, & May, 2010 for similar type of modeling). We also explored whether gender moderated any of the relationships between motives and identity. We first conducted an analysis in which we modeled change in continuous smoker identity. We then conducted analyses in which we modeled change in categorical smoker identity and social smoker identity. For the latter analyses, we conducted a set of three analyses, which included modeling dichotomous

outcomes of (1) smoker identity versus (0) non-smoker identity, (1) smoker identity vs. (0) social smoker identity, and (1) social smoker identity versus (0) non-smoker identity.

Results

Descriptive statistics for each of the study variables are displayed in Tables 2 and 3. These statistics provide an initial sense of change in the study variables across the assessment time points. There were many changes in the variables from BL to 24 months. Most notably, smoker identity consistently increased.

For an additional initial sense of change in smoker identity, we inspected the percentage of participants whose composite, standardized continuous smoker identity score was lower, the same, or higher at 24 months compared to BL and the percentage of participants who transitioned between smoker identity categories across the time points. Continuous smoker identity was higher at 24 months compared to BL among 44.18% of the participants. Of those who reported a non-smoker identity at BL ($n = 108$), 27.78% ($n = 30$) reported a social smoker identity and 76.85% ($n = 83$) reported a smoker identity at one of the subsequent time points. Of those who reported a social smoker identity at BL ($n = 131$), 24.43% ($n = 32$) reported a non-smoker identity and 55.73% ($n = 73$) reported a smoker identity at one of the subsequent time points. Of those who reported a smoker identity at BL ($n = 53$), 18.87% ($n = 10$) reported a non-smoker identity and 28.30% ($n = 15$) reported a social smoker identity at one of the subsequent time points.

Correlations among the hypothesized correlates of smoker identity development are displayed in Table 4 to provide an indication of the independence of the variables from each other. We have displayed only BL correlations because the pattern of correlations was consistent across the time points (Table 4). Social motives and smoking behavior were not significantly correlated. All other bivariate correlations were positive and significant. The size of the correlations ranged from small-medium to large. Thus, although there were correlations among the hypothesized correlates of smoker identity, on the whole the variables appeared to be independent of each other and thus potentially uniquely informative about smoker identity development.

Finally, we examined gender differences in each of the variables at each of the time points. Males smoked more cigarettes per day in the past 30 days than females at 15 months [$M = 4.43$ v. $M = 2.75$, $t(289) = 2.77$, $p = .01$] and at 24 months [$M = 4.09$ v. $M = 2.89$, $t(286) = 2.22$, $p = .03$]. Controlling for smoking behavior, males reported lower social motives than females at BL [$M = 1.91$ v. $M = 2.20$, $F(1, 288) = 6.42$, $p = .01$], lower coping motives than females at 24 months [$M = 2.85$ v. $M = 3.12$, $F(1, 285) = 4.86$, $p = .03$], and were less likely than females to identify as a social smoker compared to a non-smoker at 6 months, $\beta = -.61$, $\chi^2(1) = 4.07$, $p = .04$. There were no other gender differences.

Growth in Continuous Smoker Identity

We hypothesized that increases in smoker identity would be associated with increases in internal motives. In addition, we set out to explore the relationship between increases in smoker identity and increases in social motives. We also explored whether gender moderated

any of the relationships. A random slope and intercept model fit the data best. Main effect results are reported in Table 5. Increases in smoker identity were significantly associated with increases in coping motives. Increases in social motives were also significantly associated with subsequent increases in smoker identity, but only among males, $\gamma = .06$, $SE = .03$, $t = 2.33$, $p = .02$. Among males, the greater the increase in social motives the greater the subsequent increase in smoker identity, $\gamma = .11$, $SE = .05$, $t = 2.36$, $p = .02$, $f^2 = .01$. Among females, the relationship between social motives and smoker identity was not significant, $\gamma = -.01$, $SE = .04$, $t = -0.27$, $p > .10$, $f^2 = .00$.

Categorical Smoker Identity and Social Smoker Identity

We hypothesized that change from identifying as either a non-smoker or social smoker to identifying as a smoker would be associated with increases in internal motives. We additionally explored whether change from identifying as either a non-smoker or social smoker to identifying as a smoker would be associated with change in social motives. We also hypothesized that change from identifying as a non-smoker to identifying as a social smoker would be associated with increases in social motives, and we explored the nature of the relationship between change in internal motives and change from identifying as a non-smoker to identifying as a social smoker. In addition, we explored whether gender moderated any of the relationships. Random intercept models fit the data best. Main effect results are reported in Table 5.

Change from identifying as either a non-smoker or social smoker to identifying as a smoker was significantly associated with increases in coping motives. Interestingly, change from identifying as a non-smoker to identifying as a social smoker was also associated with increases in coping motives, but among females only, $\gamma = -.38$, $SE = .15$, $t = -2.54$, $p = .01$. Among females, change from identifying as a non-smoker to identifying as a social smoker was significantly associated with increases in coping motives, $\gamma = .57$, $SE = .22$, $t = 2.54$, $p = .01$, $OR = 1.76$ [95% $CI = 1.13, 2.73$]. Among males, there was no relationship between change in coping motives and change from identifying as a non-smoker to identifying as a social smoker, $\gamma = -.11$, $SE = .28$, $t = -.41$, $p > .10$, $OR = .89$ [95% $CI = .52, 1.54$]. The more there were coping motives for smoking, the more likely a smoker identity was to subsequently develop, and among females, the more likely a social smoker identity was to subsequently develop.

Discussion

We set out to examine correlates of smoker identity development among adolescents who smoke, drawing on insights from Self-Perception Theory (Bem, 1972) and prior evidence of sources of behavior-specific identities. The results showed that development of a smoker identity was associated with increases in negative affect coping motives and, among males, increases in social motives. In addition, the results showed that, among females, development of a social smoker identity was associated with increases in negative affect coping motives. The results also demonstrated that changes in positive affect enhancement motives for smoking were unrelated to development of either a smoker identity or a social smoker identity. The study was the first to evaluate the relationships between motives for

smoking and smoker identity development as well as social smoker identity development. The results contribute to a growing body of research on what is associated with the development of identities specific to behaviors (de Bruijn et al., 2012; Foster, 2014; Kendzierski et al., 1998; Kendzierski & Morganstein, 2009; Mermelstein, 1999; Lindgren et al., 2015).

Contrary to expectations, increases in positive affect enhancement motives for smoking were not associated with development of a smoker identity. In addition, social motives were unrelated to development of a smoker identity among females and unrelated to the development of a social smoker identity. These findings conflict with previous findings from research on drinking alcohol and exercising (de Bruijn et al., 2012; Foster, 2014; Lindgren et al., 2015), as well as basic research on identity development (Cialdini et al., 1976; Schlenker, 1986; Schlenker & Pontari, 2000; Tajfel & Turner, 1986). One potential reason why these motives were unrelated to identity development is that they may not have been perceived as purely internal or purely external motives. In fact, the internality/externality of behavioral motives might span a continuum. For instance, social motives may not have related to smoker identity development among females because the females may have perceived that they were similar to those they were motivated to fit in with, particularly if those others were close friends (Berscheid & Walster, 1978), and thereby self-other boundaries may have eroded. Interestingly, people are less likely to think that their behavior is socially motivated when they perceive that they are similar to those with whom they enact the behavior (Tice, 1992; 1994). Another potential reason for why these motives were unrelated to identity development is that, although they may have been recognized as motives for smoking, they may not have been activated frequently enough or have been predominant enough motives for smoking. In addition, social motives may not have been associated with identity development among females potentially because smoking for them was not uniquely associated with these motives. Along these lines, according to attributional theory, external cues for behavior are thought to only result in external attributions for behavior when those cues uniquely and regularly prompt the behavior for all those exposed to it (Kelley, 1967). An important area of future research is establishing the conditions under which motives are associated with identity development.

It is important to recognize that increases in smoking behavior also were consistently associated with development of smoker identity. The amount of variability in smoker identity accounted for by smoking behavior that we observed is comparable to that observed in previous investigations of smoker identity and other behavior-specific identities (Rise, Sheeran, & Hukkelberg, 2010; van den Putte et al., 2009). This finding may reflect processes of identity acquisition specified in Biased-Scanning Theory (Tice, 1992; 1994), which is an extension of Self-Perception Theory (Bem, 1972). According to Biased-Scanning Theory, when people evaluate a behavior in efforts to gain self-understanding, they call to mind previous instances of engaging in the behavior. The more times they have enacted the behavior in the past, the more they believe the behavior reflects who they are. Thus, the more that smoking occurs, the more that smoking has occurred in the past, and the greater the likelihood of the development of a smoker identity.

Interestingly, increases in negative affect coping motives were associated with development of a social smoker identity among females. Moreover, social smoker identity as assessed with the categorical measure was linearly related to smoker identity as assessed with the continuous measure. These findings call into question whether a social smoker identity represents an identity that is orthogonal to a smoker identity or is merely a weaker form of a smoker identity. However, changes in smoking rate were not associated with development of a social smoker identity, which suggests that a social smoker label is no longer applicable as smoking rate increases. Taken together, social smoker identity may reflect an orthogonal identity that is nonetheless a stepping-stone to a smoker identity.

There were differences between males and females on the study variables at various study time points. Males reported smoking more than females, which is consistent with typical findings (Johnson et al., 2015). Males also reported weaker social motives than females, which is contrary to what has been observed elsewhere among adolescents (Piko et al. 2007). Piko et al. (2007) also observed that male adolescents reported stronger positive affect enhancement motives than female adolescents, but we did not observe such a difference. We also observed that males reported weaker negative affect coping motives than females. Finally, although Okoli et al. (2011) observed that female adolescents more strongly identified as smokers than male adolescents, we did not observe any gender differences in smoker identity.

Integrating the findings of this study with other perspectives on the sources of smoker identity could help shed further light on its development. Other perspectives come from different theoretical traditions and, accordingly, different biopsychosocial levels of analysis. Leventhal and Cleary (1980) offered a cognitive-behavioral account, articulating that individuals who have tried smoking would be more likely to develop a smoker identity if they increase the frequency with which they smoke, if they are rewarded for smoking under a variety of situations and circumstances, if they perceive that smoking serves several functions (e.g., social), if they use smoking as a coping-mechanism, and through invocation of nonverbal physiological motivational systems. Shadel and Mermelstein (1996), and likewise, Shadel, Mermelstein, and Borrelli (1996) offered a social-cognitive account, noting that a smoker identity is based on knowledge of smoking histories and habits, and defining oneself as a smoker with different trait adjectives than are used to describe non-smokers. Finally, van den Putte et al. (2009) identified different sociological accounts, noting that individuals may develop a smoker identity to the extent that they engage in the behavior, that smoking is associated with a social role or membership in a social group/category, that there is reinforcement for that social role and adherence to the norms of the social group/category, and that smoking is consistent with an overall sense of self. Like Self-Perception Theory (Bem, 1972), all three of these perspectives assert that smoking has to have occurred for a smoker identity to develop, but that additional factors also play an important role. The perspective offered in this investigation most overlaps with the perspective offered by Leventhal and Cleary (1980) given their focus on smoking rate and affective processes. One thing to consider is that each of the different perspectives explains different aspects of identity, such as identity presence, identity strength, personal identity, public identity, and social group identity. For instance, whereas the current findings may address personal identity presence, the Shadel and colleagues (Shadel & Mermelstein, 1996; Shadel et al.,

1996) perspective may address personal identity strength or public identity presence, and the van den Putte et al. (2009) perspective may account for social group identity presence. In addition, these perspectives have primarily emerged within research among adult smokers, and there could be important developmental differences in identity sources between adults and adolescents. All together, the perspectives could provide explanation across different identity outcomes and stages of development.

There were several notable strengths of our investigation. The sample was large, which bolsters reliability of our findings. The sample was also diverse with respect to gender, which bolsters external validity of our findings. Participants were followed for a substantial amount of time, which ensured the ability to observe growth in the variables included in this study. In addition, participants were followed at a time that they would be most likely to develop into regular smokers. The measures were reliable and valid for a sample of adolescents who smoke. Analyses were prospective and controlled for smoking experience, which allowed for some, albeit limited, insight into whether there is a causal influence of smoking motives on smoker identity.

There were also several limitations of our investigation. First, the study was correlational. In addition, the sample had smoking experience at baseline, by which point a reciprocal relationship between smoking motives and smoker identity may have already begun to emerge. Inferences about the causal influence of smoking motives on smoker identity development are thereby limited. It would have been advantageous to have a sample that had no smoking experience prior to baseline and then subsequently smoked. The parent study sample, from which the sample came, was oversampled for adolescents who had ever tried smoking prior to baseline, and so there was not a sufficiently large set of participants of this makeup for adequate statistical power.

Second, there were potential limitations of our identity measurement. Continuous smoker identity was assessed with only two items. Using such a small number of items potentially limited validity of the measurement. However, a similarly small number of items have been used to measure continuous identity in other behavior-specific self-identity studies (Rise et al., 2010) and smoker identity studies specifically (Hertel & Mermelstein, 2012; Moan & Rise, 2005). Social smoker identity was not assessed separately from occasional smoker identity, and so we may not have achieved an entirely pure measurement of social smoker identity. Identification as a social smoker has often been considered a distinct subset of identification as an occasional smoker and thereby assessed separately (Rosa & Aloise-Young, 2015). However, these two identities often overlap (Okoli et al., 2011). In our analyses, we collapsed ex-smoker, non-smoker, or trier identity responses together. Our sample of adolescents who were relatively early, inexperienced, and low frequency smokers did not strongly perceive distinctions between these identity categories. Responses to the continuous smoker identity scale did not consistently differ between these identity categories. Importantly, our continuous smoker identity measurement was reliable, and the identity measurements we used have shown good construct and predictive validity (Hertel & Mermelstein, 2012).

Third, there were also potential limitations of our motives measurement. Like with the continuous identity assessment, there were a limited number of motives items, which could have limited measurement validity. The lack of separation between the social reward and social conformity motives into different factors may have been a function of assessing those motives with only one item each. Nonetheless, the factor-analyzed motives scales were reliable. The negative affect coping motive measure was most reliable, which may have contributed to this motive being a stronger correlate of smoker identity development than the other motives.

Finally, our sample was not racially diverse, and this precluded examining for differences by race in smoking rate, smoking motives, smoker identity, and the relationship between smoking motives and smoker identity.

Future studies could further investigate the conditions under which motives will relate to smoker identity development (such as frequency of activation, predominance of the motive, or specificity of association with smoking), additional external motives (e.g., smoking for work reasons like portraying a smoker in a film shoot or smoking for appearance reasons like weight or attractiveness), different correlates of smoker and social smoker identities, as well as gender and race differences in identity development. Finally, it will be important for future research to experimentally test whether motives have a causal influence on smoker identity development.

Conclusion

Smoker identity development –a correlate of smoking escalation -- was associated with increases in negative affect coping motives and, among males, was associated with increases in social motives. Among females, social smoker identity development was associated with increases in negative affect coping motives. Smoker and social smoker identities are signaled by negative affect coping as well as social motives for smoking. Future work should experimentally examine the influence of motives on smoker identity development, explore the conditions under which smoking motives are associated with smoker identity development, further explore the differences between smoker identity and social smoker identity, examine additional external motives, and examine gender and race differences in identity development.

Acknowledgments

This research was supported by Grant 5P01CA098262 from the National Cancer Institute. Thanks to Rachel L. Ruttan for significant feedback on drafts of this manuscript.

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Table 1
Differences in Continuous Smoker Identity by Categorical Smoker Identity, BL-24 months

Assessment	Smoker	Social smoker	Ex-smoker	Trier	Non-smoker	ANOVA
BL	<i>M</i>	1.26 _a	-.31 _c	-.67 _d	-.76 _d	$F(4, 287) = 77.94, p < .0001$
	<i>SD</i>	.82	.57	.42	.39	
	<i>n</i>	53	23	71	14	
6 months	<i>M</i>	.90 _a	-.40 _c	-.70 _c	-.98 _c	$F(4, 287) = 48.90, p < .0001$
	<i>SD</i>	.78	.66	.64	0	
	<i>n</i>	79	20	52	2	
15 months	<i>M</i>	.78 _a	-.37 _b	-.77 _c	-1.05 _c	$F(4, 287) = 64.83, p < .0001$
	<i>SD</i>	.71	.66	.72	0	
	<i>N</i>	112	17	26	8	
24 months	<i>M</i>	.70 _a	-.38 _b	-1.02 _c	-.93 _c	$F(4, 286) = 59.24, p < .0001$
	<i>SD</i>	.71	.80	.36	.41	
	<i>n</i>	119	20	17	5	

Note. Means for the composite index of continuous smoker identity based on standardized scores are reported in this table. Different subscripts across categorical smoker identity categories represent significant mean differences, $p < .05$.

Table 2

Descriptive Statistics for Continuous Variables, BL-24 Months

Variable	BL	6 months	15 months	24 months
How much is being a smoker part of who you are?	<i>M</i> (<i>SD</i>)	1.92 (.95)	1.99 (.99)	2.11 (1.04)
	<i>n</i>	292	292	292
How important are cigarettes in your life?	<i>M</i> (<i>SD</i>)	1.89 (.97)	2.03 (1.06)	2.16 (1.11)
	<i>n</i>	292	291	292
Smoking behavior (cigarettes/day in past 30 days)	<i>M</i> (<i>SD</i>)	1.32 (2.82)	2.14 (3.96)	3.46 (5.17)
	<i>n</i>	291	290	291
Coping motives	<i>M</i> (<i>SD</i>)	2.86 (1.10)	3.04 (1.10)	3.11 (1.09)
	<i>n</i>	292	292	292
Enhancement motives	<i>M</i> (<i>SD</i>)	1.72 (.85)	1.87 (.98)	1.89 (.94)
	<i>n</i>	292	292	292
Social motives	<i>M</i> (<i>SD</i>)	2.07 (.97)	2.14 (1.07)	2.07 (1.02)
	<i>n</i>	292	292	292

Table 3
Descriptive Statistics for Categorical Smoking-Related Identities, BL-24 Months

Variable	BL	6 months	15 months	24 months
Smoker	% 18.15 <i>n</i> 53	27.05 79	38.36 112	40.89 119
Social smoker	% 44.86 <i>n</i> 131	47.60 139	44.18 129	44.67 130
Ex-smoker	% 7.88 <i>n</i> 23	6.85 20	5.82 17	6.87 20
Someone who tried smoking	% 24.32 <i>n</i> 71	17.81 52	8.90 26	5.84 17
Non-smoker	% 4.79 <i>n</i> 14	0.68 2	2.74 8	1.72 5
<i>Total n</i>	292	292	292	291

Table 4

Correlations Between Each of the Hypothesized Correlates of Smoker Identity at Baseline

	Smoking behavior (cigarettes/day in past 30 days)	Coping motives	Enhancement motives	Social motives
Smoking behavior (cigarettes/day in past 30 days)	1	.27 ^{****} (291)	.22 ^{***} (291)	.01 (291)
Coping motives		1	.51 ^{****} (292)	.27 ^{****} (292)
Enhancement motives			1	.35 ^{****} (292)
Social motives				1

Note.^{****}
p < .0001,^{***}
p < .001,^{**}
p < .01,^{*}
p < .05,[^]
p < .10

Table 5

Smoker Identity Sources

Outcome	Continuous smoker identity			Smoker identity v. non-smoker identity			Smoker identity v. non-smoker identity			Social smoker identity v. non-smoker identity		
	γ (SE) <i>t</i>	f^2	γ (SE) <i>t</i>	OR OR 95% CI	γ (SE) <i>t</i>	OR OR 95% CI	γ (SE) <i>t</i>	OR OR 95% CI	γ (SE) <i>t</i>	OR OR 95% CI		
Intercept	-.50 (.10) -5.13 ****	X	-2.20 (.55) -4.02 ****	X	-2.56 (.49) -5.23 ****	X	.35 (.51) .70	X				
Time point	-.05 (.02) -2.35 *	.01	.13 (.15) .89	1.14 .85, 1.52	.01 (.11) .05	1.00 .80, 1.26	.39 (.13) 3.04 **	1.48 1.15, 1.91				
Smoking rate (cigarettes/day in past 30 days)	.05 (.01) 6.84 ****	.18	.36 (.07) 5.01 ****	1.43 1.24, 1.65	.48 (.06) 7.52 ****	1.61 1.42, 1.83	-.08 (.06) -1.21	.93 .82, 1.05				
Coping motives	.12 (.03) 4.22 ****	.03	.66 (.17) 3.79 ****	1.94 1.37, 2.74	.35 (.14) 2.49 *	1.42 1.08, 1.87	.30 (.16) 1.85 ^	1.36 .98, 1.87				
Enhancement motives	.00 (.03) .01	.00	-.08 (.20) -.43	.92 .62, 1.36	.09 (.17) .54	1.09 .79, 1.51	-.21 (.20) -1.05	.81 .54, 1.21				
Social motives	.04 (.03) 1.25	.00	.10 (.18) .56	1.10 .78, 1.56	-.04 (.14) -.33	.96 .73, 1.25	.13 (.17) .79	1.14 .82, 1.59				

Note. $n = 292$,

**** $p < .0001$,

*** $p < .001$,

** $p < .01$,

* $p < .05$,

^ $p < .10$