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Nicotine-Dependence-Varying Effects of Smoking Events on Momentary Mood Changes among Adolescents

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Abstract

Introduction—Theories of nicotine addiction emphasize the initial role of positive reinforcement in the development of regular smoking behavior, and the role of negative reinforcement at later stages. These theories are tested here by examining the effects of amount smoked per smoking event on smoking-related mood changes, and how nicotine dependence (ND) moderates this effect. The current study examines these questions within a sample of light adolescent smokers drawn from the metropolitan Chicago area (N=151, 55.6% female, mean 17.7 years).

Instruments—Ecological momentary assessment data were collected via handheld computers, and additional variables were drawn from a traditional questionnaire.

Methods—Effects of the amount smoked per event on changes in positive affect (PA) and negative affect (NA) after vs. before smoking were examined, while controlling for subject-

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averaged amount smoked, age, gender, and day of week. ND-varying effects were examined using varying effect models to elucidate their change across levels of ND.

Results—The effect of the amount smoked per event was significantly associated with an increase in PA among adolescents with low-to-moderate levels of ND, and was not significant at high ND. Conversely, the effect of the amount smoked was significantly associated with a decrease in NA only for adolescents with low levels of ND,

Conclusions—These findings support that the role of positive reinforcement in early stages of dependent smoking, but do not support the role of negative reinforcement beyond early stages of smoking. Other potential contributing factors to the relationship between smoking behavior and PA/NA change are discussed.

Keywords

adolescents; nicotine dependence; smoking; varying-coefficient model

1. Introduction

Cigarette smoking poses a significant threat to public health as the primary cause of preventable deaths in the U.S. (Armour, Woolery, Malarcher, Pechacek, & Husten, 2005; Mokdad, Marks, Stroup, & Gerberding, 2004). A major component of cigarettes' widespread negative consequences is their addictiveness. Nicotine dependence (ND) impacts 50% of U.S. adults, and its prevalence has remained stable or even increased over several decades (Goodwin, Keyes, & Hasin, 2009). ND is a major factor predicting continued smoking (DiFranza et al., 2002; Ip et al., 2011) and failed quit attempts (Haddock, Lando, Klesges, Talcott, & Renaud, 1999; Piper et al., 2011). Though ND has traditionally been thought to require several years of regular smoking, relatively recent findings have shown that adolescents can experience ND at very light and infrequent smoking (DiFranza et al., 2000; O'Loughlin et al., 2003); this early-emerging ND strongly predicts future smoking behavior (Dierker & Mermelstein, 2010; DiFranza et al., 2002). Understanding the etiology of ND is important for smoking prevention and cessation efforts.

Theoretical work on ND has postulated that positive and negative reinforcement develop and maintain regular smoking behavior (Baker, Brandon, & Chassin, 2004; Tiffany, Conklin, Shiffman, & Clayton, 2004). Initially, the sensory rewards of smoking are thought to contribute to positive reinforcement of smoking (Russell, 1971), and the hedonic effects of nicotine are thought to help establish repeated self-administration of nicotine (Koob, 1996; Wise, 1988). Repeated doses of nicotine, however, lead to tolerance and withdrawal symptoms (Ahmed & Koob, 1998; Baker et al., 2004; Watkins, Koob, & Markou, 2000), triggering the process of negative reinforcement. That is, abstaining from nicotine triggers negative affective states and increased stress responses (Dani & Heinemann, 1996; Koob, 1996; Watkins et al., 2000), and negative reinforcement occurs upon smoking to relieve the resulting withdrawal symptoms (Dani & Heinemann, 1996; Koob, 1996; Russell, 1971; Tiffany et al., 2004; Watkins et al., 2000). Thus, positive reinforcement is thought to contribute to early stages of nicotine addiction, and negative reinforcement is hypothesized

to take over as the driving force maintaining addicted, chronic smoking behavior (Russell, 1971; Tiffany et al., 2004).

Ecological momentary assessment (EMA) data is a relatively recently-developed assessment method in which data are collected very close in time to when events occurred, which reduces recall bias (Moskowitz & Young, 2006). EMA is commonly collected via “electronic interviews” on handheld computers, once to several times per day. EMA has been successfully used in several different populations (e.g. healthy adults, children, the elderly, and individuals with depression) (Moskowitz & Young, 2006), and in many smoking studies, examining e.g. affect states (Hoeppner, Kahler, & Gwaltney, 2014), situational risks (Mitchell et al., 2014), and time to lapse (Wilson et al., 2014).

Previous research using EMA data has examined issues related to reinforcement in individual smoking episodes. One study of adolescents found that positive affect (PA) is higher, and negative affect (NA) is lower, after smoking events compared to random non-smoking periods, and that these differences became more consistent for heavier smokers (Hedeker, Mermelstein, Berbaum, & Campbell, 2009). Another study found that smoking is associated with significant increases in PA and decreases in NA, and that these smoking-related mood changes became more consistent as individuals increased their smoking (Hedeker & Mermelstein, 2012). However, these studies evaluated these effects across levels of smoking frequency rather than ND. Thus, these studies do not directly address the role of reinforcement processes in shaping nicotine addiction, since ND can vary greatly across individuals with a given level of smoking frequency. In particular, it is possible that the changing roles of positive and negative reinforcement over stages of addiction may represent moderation of these reinforcement processes by ND.

The current study aimed to test the theories that positive reinforcement decreases, and negative reinforcement increases, with greater ND; that is, that ND is a moderator of these reinforcement processes. This study took advantage of a cohort of adolescents oversampled for novice and light smokers, who provided EMA data on smoking events and PA/NA. Additionally, an innovative varying effect model (VEM) was used, which empirically estimates nonlinear trends in varying coefficients, rather than requiring a specification of a particular type of trend (e.g. linear, quadratic, etc.) (Tan, Shiyko, Li, Li, & Dierker, 2012; “TVEM SAS Macro Suite (Version 2.1.0) [Software],” 2012; Yang, Tan, Li, & Wagner, 2012). In contrast to most VEM models which traditionally examine time-varying effects (e.g. Selya et al., 2012), this study presents a new application of the VEM to dimensions other than time, namely ND. While time-varying effect models examine the interaction of a variable with time, the current study examines the interaction with ND. This allows the current study’s examination of whether the effect of smoking behavior (the amount smoked per self-reported EMA smoking prompt) on smoking-related mood changes (changes in PA and NA after vs. before smoking) differs across the spectrum of ND, such that the effect on PA increases and the effect on NA decreases across participants with greater ND.

2. Methods

2.1. Participants

The sample was drawn from the larger Social and Emotional Contexts of Adolescent Smoking Patterns Study (SECASPS), and was selected as shown in Figure 1. All 9th and 10th graders at 16 Chicago-area high schools completed a brief screener survey ($N=12,970$). Students were eligible to participate in the study if they classified as: 1) former experimenters (smoked in the last year, but not in the last 90 days, and smoked <100 cigarettes/lifetime); 3) current experimenters (smoked in the past 90 days but smoked <100 cigarettes/lifetime); and 4) regular smokers (smoked in the past 30 days and smoked >100 cigarettes/lifetime). Invitation/recruitment packets were mailed to eligible students and their parents, as well as a random sample of never- ($N=3,654$). Of those invited and who provided written parental consent and student assent, 1,263 (34.6%) completed the baseline measurement wave.

A random subset of the baseline participants also completed the EMA component ($N=461$, 36.5%). To be eligible for the EMA, adolescents had to report smoking in the year prior to baseline ($N=947$). Ninety-two percent of those invited to participate in the EMA agreed and enrolled. Those who participated did not differ from non-participants on demographics or smoking behavior. Both the EMA component and the traditional (non-EMA) questionnaire took place over several waves spanning 24 months; however, the present study uses only the 24-month assessment, because it contains the widest distribution of ND scores across participants, allowing for more accurate effect estimates.

Of the baseline EMA sample, participants through 24 months ($N=385$) relative to those who dropped out by 24 months ($N=76$) did not differ by gender, race/ethnicity, age, or GPA at baseline. However, EMA nonparticipation at 24 months was higher among youth whose parent did not complete the extensive parent questionnaire at baseline ($X^2=7.97$, d.f.=1), $p=.005$. EMA non-participants at 24 months also reported a greater number of days smoked in the past 30 at baseline ($M=5.1$ days, $SD=8.81$ vs. $M=7.8$, $SD=10.48$; t -test $p=.038$).

The final sample was adolescents who reported at least one smoking event in the 24-month EMA assessment ($N=151$), and includes only smoking prompts since change scores in PA/NA are not available for random prompts. Demographic and smoking characteristics of this final sample are shown in Table 1.

2.2. Data collection procedures

At each wave, the traditional survey was given first using paper-and-pencil questionnaires and in-person interviews, and the EMA component was administered the following week. EMA procedures have been described previously (Hedeker, Mermelstein, et al., 2009). Briefly, EMA participants carried a hand-held computer with them at all times for one full week. They were asked to initiate an “electronic interview” immediately after every “smoking event” (i.e. contiguous episode in which smoking actually occurred). Each interview included questions about mood, activity, and social companionship.

2.3. Measures

2.3.1. EMA variables

2.3.1.1. Amount smoked: Amount smoked per self-initiated EMA smoking prompt was coded as the number of cigarettes according to momentary self-reports and as follows: “a puff”=0.2 cigarettes (2% of responses), “a few puffs”=0.5 (6%), “less than one cigarette”=0.75 (6%); “one cigarette”=1 (52%), “more than one cigarette”=2 (34%). At the 24-month wave, subjects reported on average 1 smoking event/day (mean=1.09, range=0–10).

2.3.1.2. Change in PA: PA was measured using participants’ momentary ratings at each smoking event of how much, on a scale of 1–10, they felt: happy, relaxed, cheerful, confident, and accepted by others. These five measures were averaged into an overall PA score. At each interview, participants were first asked how they felt “right now” and then how they felt “just before” they smoked. The smoking-related change in PA was calculated as after- minus before smoking.

2.3.1.3. Change in NA: NA was measured using participants’ momentary ratings at each smoking event of how much, on a scale of 1–10, they felt: frustrated, angry, stressed, irritable, and sad. These five measures were averaged into an overall NA score, and at each interview, participants reported their NA both right now and just before (i.e. before and after smoking). The smoking-related change in NA was calculated as after- minus before-smoking NA. NA change was moderately correlated with PA change ($r=-0.31$, $p<.0001$).

2.3.1.4. Weekday: Day of the week was coded categorically, with Sunday as the reference level.

2.3.2. Traditional questionnaire variables

2.3.2.1. Smoking quantity and frequency: Past-30-day smoking behavior was measured with two items. Participants were asked on how many days they smoked cigarettes (smoking frequency) and the total number of cigarettes they smoked (smoking quantity) in the past 30 days.

2.3.2.2. ND: ND was assessed with a shortened version of the Nicotine Dependence Syndrome Scale (NDSS) (Shiffman, Waters, & Hickcox, 2004), modified for use with adolescents. The full NDSS scale was reduced to 10 items based on psychometric analyses conducted on an adolescent sample (Sterling et al., 2009). Research supports the reliability, stability, construct validity, and predictive validity of the NDSS for use with adolescents (Clark et al., 2005; Sledjeski et al., 2007), and the modified version demonstrated strong internal consistency with the current sample (coefficient alpha=.93). Items in the current study were answered on a four-point Likert-type scale, ranging from 1 (not at all true) to 4 (very true). The item “I function much better in the morning after I’ve had a cigarette” was coded as 0 for adolescents who reported not smoking in the morning. All valid items (minimum 5) were averaged as a total NDSS score. At the 24-month wave, all levels of NDSS were well-represented (mean=2.1, 1st quartile=1.3, 3rd quartile=2.8).

2.3.2.3. Other tobacco use: Other tobacco use: Other tobacco use was measured with the following questions. During the past 30 days, on how many days did you a) use chewing tobacco, snuff or dip; b) smoke cigars, cigarillos or little cigars; c) smoked bidis or d) smoked kreteks? Responses were dichotomized into any other tobacco use vs. no other tobacco use.

2.3.2.4. Race/ethnicity: Race/ethnicity from screening included six categories and was dichotomized into White vs. not White.

2.3.2.5. Age: Participants' age was calculated from birth dates.

2.3.3. Analyses—Varying effect models (VEM's) were run using a publicly available SAS macro ("TVEM SAS Macro Suite (Version 2.1.0) [Software]," 2012). This VEM macro has several advantages. First, it allows an examination of moderation along a continuous variable (ND). Additionally, it *empirically* estimates the shape of change in a coefficient, in contrast to traditional models in which make strong parametric assumptions about the shape (e.g. linear or quadratic), potentially leading to misspecification of this shape and potentially inaccurate conclusions (Tan et al., 2012). This VEM macro utilizes P-spline-based methods for estimation: the function is split into equal intervals based on k , the user-chosen number of knots, and the function within each interval is approximated with a lower-order polynomial (i.e. a cubic function)(Yang et al., 2012).

VEM's were run using $k=10$ knots to examine the effects of the amount smoked per event on smoking-related changes in PA and NA, and their variation across levels of ND. Because both the amount smoked per event and NDSS are correlated with past-month smoking frequency and quantity, day of the week, other tobacco use, age, race, and gender, these variables were included as covariates in the original VEM's. The models were then pruned to remove any covariate not significant at $p<.10$. The average amount smoked per prompt for each subject) was included as an additional subject-level covariate in order to more accurately estimate the within-subject effects of amount smoked per event (Begg & Parides, 2003). The ND-varying coefficients of the amount smoked on changes in PA and NA and their 95% confidence intervals were interpreted.

3. Results

Descriptive analyses (Table 1) showed that the final sample consisted of relatively light (<4 cigarettes/day on average in the past 30 days) and nondaily (18 days smoked out of the past 30) smokers, and experienced a wide range of nicotine dependence (mean NDSS score 2.1; range: 0.8–3.9).

Adolescents with low ND (NDSS<2; N=68) smoked on approximately 9 days out of the past 30 and just over 1 cigarette/day on average. Adolescents with moderate ND (NDSS 2 but <3; N=51) smoked on approximately 24 days out of the past 30 and on average 5.6 cigarettes/day. Adolescents with high ND (NDSS 3; N=30) smoked on 29 days out of the past 30 and approximately 8 cigarettes/day. Overall, participants on average smoked 1.3

cigarettes per smoking event. Smoking events on average resulted in a 0.3 point *increase* in PA (range: -6.4–8.6), and a 0.4 *decrease* in NA (range: -8.6–5.4).

ND-varying effect models revealed that the amount smoked per prompt was significantly associated with an increase in PA (Figure 2) and a decrease in NA for some values of ND (Figure 3), after controlling for other significant covariates (Table 2). Coefficients are interpreted in the same way as are (unstandardized) coefficients from standard regression, i.e. as the change in affect (on the original point scale) associated with smoking 1 additional cigarette per prompt.

Specifically, the amount smoked was significantly associated with an increase in PA for participants with low and moderate NDSS scores (< 2.99 , corresponding to regions in which the confidence band falls above 0), such that for every additional cigarette smoked, PA increased by a maximum of 0.63 out of a possible 20 points.

The amount smoked was also associated with a decrease in NA for participants with low NDSS scores (< 1.35 , corresponding to regions in which the confidence band falls below 0), such that for every additional cigarette smoked, NA decreased by a maximum of 0.77 out of the same scale. The coefficient of amount smoked on smoking-related mood changes varied significantly across levels of ND.

As shown by non-overlapping confidence bands between different values of NDSS, the effect of the amount smoked per prompt on changes in PA significantly decreased at high (approx. NDSS > 3) relative to moderate (approx. NDSS 2–2.5) values of ND (Figure 2), and the effect of the amount smoked on changes in NA significantly increased for medium and high values of ND (approx. NDSS > 2) relative to low values (approx. NDSS < 1.3) (Figure 3).

4. Discussion

This study examined the effects of the amount smoked per event on the smoking-related changes in PA and NA, and examined how these relationships varied across different levels of ND. ND-varying effect models revealed that 1) the amount smoked per event was associated with an increase in momentary PA for low and moderate values of ND, but for high values of ND, this relationship significantly decreased to non-significance; and 2) the amount smoked per prompt was associated with a decrease in momentary NA only for low values of ND, but for moderate and high values of ND, this relationship significantly increased to non-significance.

The current findings of the smoking-related change in PA, namely its significance only at low and moderate values of ND, are consistent with previous work on nicotine addiction theorizing that positive reinforcement (a likely result of nicotine's hedonic properties and other sensory rewards) drives the initial stages of addiction (Koob, 1996; Russell, 1971; Tiffany et al., 2004; Wise, 1988). Additionally, this result is also consistent with an earlier study of the current sample showing that the effect of smoking quantity on the frequency of smoking is initially high, but decreases over time; a relationship that may represent positive reinforcement (Selya et al., 2012). However, it is possible that other factors besides positive reinforcement motivate smoking events at very early stages of smoking, for example peer

influence, opportunities to smoke (given the age- and school-related restrictions of smoking for these adolescents), stress relief, psychosocial rewards (Russell, 1971), or smoking expectancies (Baker et al., 2004).

The trends in the smoking-related change in NA across adolescents with varying levels of ND generally appear to be inconsistent with theoretical accounts of nicotine addiction, despite the expected finding of a smoking-related decrease in NA. Theories postulate that, after positive reinforcement drives the initial stages of addiction, negative reinforcement via nicotine withdrawal (Tiffany et al., 2004) and dependence symptoms is responsible for maintaining addiction (Dani & Heinemann, 1996; Koob, 1996; Russell, 1971; Watkins et al., 2000). Thus, this theory cannot explain the observed decrease in the effect of NA across increasing ND. One potential explanation for this unexpected result is that nicotine-dependent adolescents preemptively smoke in order to prevent the onset of NA due to withdrawal symptoms (DiFranza et al., 2011; Tiffany et al., 2004). That is, in anticipation of these negative consequences, adolescents shorten the intervals between cigarettes (DiFranza et al., 2011). Thus, while the effect of ND increases with progressive smoking exposure (Selya et al., 2012), the possibility that nicotine-dependent adolescents may not be abstaining from cigarettes long enough to actively experience NA may explain the lack of a change in NA at more advanced stages of ND. Alternatively, the unexpected trends of NA may also reflect mood stabilization thought to occur with smoking (Hedeker, Demirtas, & Mermelstein, 2009; Hedeker & Mermelstein, 2012; Hedeker, Mermelstein, et al., 2009). Since increased smoking exposure is associated with more consistent mood reports, the amount smoked per prompt may become less relevant in predicting the smoking-related change in NA.

4.1. Limitations

Several limitations of the current study should be noted. First, given the sampling strategy for this study, caution should be taken when generalizing these findings to other populations. Second, the accuracy of the data is limited by the reliability of self-report. Although the EMA procedure mitigates this concern to some extent by assessing momentary rather than retrospective affect, reports of pre-smoking PA/NA was assessed immediately after smoking, and conceivably could be biased by the after-effects of smoking. Further, the direction and magnitude of this potential bias could vary across levels of ND. Additionally, the current study examines ND-varying effects across subjects, and thus cannot inform about smoking-related mood changes across within-subject increases in ND. Also, the current study's use of *changes* in PA and NA restricted analysis to smoking prompts and excluded random prompts. Thus, the mood changes related to binary smoking are unknown, and further, it is uncertain whether the resulting examination of dose response is appropriate for assessing reinforcement. Further, an ideal test of the negative reinforcement hypothesis would involve testing an increase in NA during a non-smoking event; however, since this is impossible with the current measures, the conclusions are based on testing the decrease in NA after smoking. Finally, the results only show associations between smoking-related mood changes and the amount smoked per prompt, and cannot be used to conclude causal relationships.

4.2. Strengths

Despite these limitations, this study has a number of strengths. The EMA component increases accuracy of adolescents' self-reports of affect and smoking behavior, and provides data wide range of ND scores, ideal for VEM's. The VEM macro employed in this study is an innovative, complex model that allows changes to be estimated from the data, in contrast to traditional models which require strong parametric assumptions about the trend (Tan et al., 2012; "TVEM SAS Macro Suite (Version 2.1.0) [Software]," 2012; Yang et al., 2012). Additionally, this study demonstrates a new application of this VEM macro by examining coefficient changes over ND rather than over time. Finally, this research confirms previous studies showing that momentary PA and NA are associated with smoking events (Hedeker & Mermelstein, 2012; Hedeker, Mermelstein, et al., 2009), and extends these findings by examining the moderation of these associations across a continuous range of ND in order to evaluate theories of the nicotine addiction process.

4.3. Conclusions

The current findings are relevant to theories of nicotine addiction in that they confirm the role of positive reinforcement at early-to-intermediate stages in the development of regular smoking behavior, but suggest that other factors besides negative reinforcement (such as mood stability and/or desire to prevent NA) drive smoking behavior at more advanced stages of smoking. Additionally, these findings can inform targeted intervention efforts for beginning adolescent smokers. In particular, if causally related, strategies that disrupt the positive reinforcement process at early stages of smoking, e.g. by decreasing the number of cigarettes smoked, may prove effective at preventing progression to more advanced stages of smoking.

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Highlights

- Smoking results in higher positive affect at low-to-medium nicotine dependence
- Smoking results in lower negative affect only at very low nicotine dependence
- Smoking does not result in affect changes at high levels of nicotine dependence
- Role of positive reinforcement in early stages of addiction is supported
- Role of negative reinforcement at later stages of addiction is not supported

Figure 1. Flow chart showing the process for selecting the current sample
See section 2.1 for details.

Figure 2. ND-varying effects of the amount smoked per prompt on changes in momentary PA
 The solid central line shows the coefficient estimate of cigarettes per prompt in predicting the change in PA, over varying levels of ND. The ribbon shows the 95% confidence interval. Confidence bands that fall entirely outside of 0 indicate areas where the coefficient significantly differs from 0, and non-overlapping confidence bands indicate a significant change in the size of the coefficient.

Smoking-related change in NA

Figure 3. ND-varying effects of the amount smoked per prompt on changes in momentary NA
 The solid central line shows the coefficient estimate of cigarettes per prompt in predicting the change in NA, over varying levels of ND. The ribbon shows the 95% confidence interval. Confidence bands that fall entirely outside of 0 indicate areas where the coefficient significantly differs from 0, and non-overlapping confidence bands indicate a significant change in the size of the coefficient.

Table 1
Demographic and smoking characteristics for the final sample (N=151)

Percentages based on valid responses at the 24-month assessment wave.

Characteristic	Frequency (%)
Female sex	84 (55.6%)
Race/Ethnicity	
Non-Hispanic White	94 (62.3%)
Non-Hispanic Black,	17 (11.3%)
Hispanic	31 (20.5%)
Asian/Pacific Islander	1 (0.7%)
American Indian/Alaska Native	0 (0%)
Smoked in the past 24 hours	95 (62.9%)
Other tobacco use in past 30 days	73 (48.7%)
Ever smoked daily in lifetime	107 (28.7%)
Smoked daily in the past month	53 (35.6)
	<hr/> Mean (SD) <hr/>
Mean age, years	17.7 (0.58)
Past-30-day smoking frequency	17.9 (11.68)
Past-30-day smoking quantity	115.9 (147.33)
NDSS score of 10 items on a scale of 1–4	2.1 (0.88)
Smoking-related change in positive affect (PA)	0.3 (1.36)
Smoking-related change in negative affect (NA)	−0.4 (1.42)
Amount smoked per prompt	1.3 (0.54)

Table 2
Varying effect model (VEM) results for nicotine dependence (ND)-invariant covariates

Results are shown for smoking-related change in positive affect (PA; right) and negative affect (NA; left). Coefficients are shown, followed by standard errors in parentheses. Blank cells (--) indicate that the coefficient was not significant ($p > .10$), and was removed from the final model. Bold: $p < .05$.

Covariate	PA change	NA change
Past-month smoking frequency	--	--
Past-month smoking quantity	--	--
Subject-average amount smoked	0.097 (0.087)	-0.261 (0.102)
Other tobacco use	--	--
Age at baseline	--	0.220 (0.080)
Gender		
Female (vs. male)	--	0.235 (0.088)
Non-White ethnicity (vs. White)	--	--
Weekday (vs. Sunday)		
Monday	--	-0.063 (0.170)
Tuesday	--	-0.023 (0.172)
Wednesday	--	-0.116 (0.164)
Thursday	--	-0.141 (0.163)
Friday	--	-0.306 (0.158)
Saturday	--	-0.219 (0.172)

Table 3
Tabular format of the effect of amount smoked per prompt on change in PA (top) and NA (bottom)

For each value of NDSS listed (columns), the coefficient (B) point estimate and 95% confidence interval (CI) are shown. Bold: Coefficient is significantly different from 0, indicating that the amount smoked is associated with a significant (i.e. nonzero) change in affect.

NDSS score		1	1.5	2	2.5	3	3.5
PA	B estimate	0.35	0.25	0.39	0.33	0.12	0.02
	95% CI	0.61 – 0.09	0.09 – 0.43	0.24 – 0.54	0.21 – 0.45	0.01 – 0.23	–0.11 – 0.16
NA	B estimate	–0.53	–0.14	0.06	0.10	0.03	–0.09
	95% CI	–0.84 – –0.20	–0.36 – 0.08	–0.14 – 0.26	–0.07 – 0.27	–0.13 – 0.20	–0.26 – 0.08