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Specific Dimensions of Impulsivity Are Differentially Associated with Daily and Non-Daily Cigarette Smoking in Young Adults

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Abstract

Young adults are at risk for initiation of tobacco use and progression to tobacco dependence. Not every person who smokes cigarettes becomes tobacco dependent, however, and non-daily smoking is becoming more prevalent among those who use tobacco. It is likely that individual differences in psychosocial and behavioral factors influence risk for engaging in non-daily and daily cigarette smoking. The objective of this study was to investigate the associations between impulsivity and smoking status in young adults who vary in frequency of cigarette smoking. Young adult first-year college students between the ages of 18-24 (512) were classified to one of three groups: non-smokers, non-daily smokers, or daily smokers, and impulsivity was assessed using the UPPS-P(Negative and Positive Urgency, lack of Premeditation, lack of Perseverance, Sensation Seeking). When all impulsivity dimensions were used simultaneously to predict smoking status, negative urgency predicted increased risk of membership in the daily smoking group and lack of premeditation predicted increased risk of membership in the non-daily smoking group. These results suggest that dimensions of impulsivity may contribute differentially to forms of smoking behavior in young adults.

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Contributors: DRL and RM designed the study, wrote the protocols, and directed the study. JRP conducted the primary analysis of the data and wrote the initial draft of the results section. ZWA compiled the dataset and assisted with data analysis. DCL assisted with the data analysis and wrote the initial draft of the manuscript. All authors contributed to the writing and have approved the final manuscript.

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Keywords

impulsivity; UPPS; tobacco; young adults; urgency; premeditation

1. Introduction

Entry into college is a period of increased vulnerability to a variety of risk-related behaviors (e.g. Fromme, Corbin, & Kruse, 2008), including cigarette smoking. Up to 25% of college students begin smoking after turning eighteen (Everett et al., 1999; Foldes et al., 2010), and approximately 28% of college students who smoke intermittently escalate to heavier patterns of use at the age of nineteen or older (Wechsler et al., 1998). However, it is important to note that not every young adult who initiates smoking transitions to daily use (Henningfield et al., 2003), and intermittent, or non-daily smoking is prevalent in young adult cigarette smokers (Berg et al., 2012; Sutfin, Reboussin, McCoy, & Wolfson, 2009). Nevertheless, while the negative health-related effects of smoking are greatest in those who smoke daily, non-daily smokers are also at risk for increases in negative health-related effects (Caldeira et al., 2012; Schane, Ling, & Glantz, 2010) and have similar relapse rates as daily smokers during cessation attempts (Tindle & Shiffman, 2011). Given the host of health problems associated with tobacco use—including non-daily smoking—it is critical to understand risk factors that predict these different patterns of tobacco use in young adults transitioning to college to better guide prevention and treatment efforts.

Impulsivity, broadly defined, is associated with multiple aspects of cigarette smoking behavior (i.e. initiation and dependence); however, given the multidimensional nature of impulsivity, identifying the key components contributing to tobacco use is crucial. The UPPS model of impulsivity (Lynam, Smith, Whiteside, & Cyders, 2006; Whiteside & Lynam, 2001) includes five distinct pathways to impulsive and risky behavior (positive and negative urgency, lack of premeditation, lack of perseverance, and sensation seeking). Some of these dimensions appear to play specific roles in the etiology of cigarette smoking and nicotine dependence. For instance, sensation seeking (defined as the tendency to enjoy and pursue exciting, risky activities) is associated with initiation of cigarette smoking (e.g. Lipkus, Barefoot, Williams, & Siegler, 1994; Perkins et al., 2008), greater positive effects of nicotine (Perkins, Gerlach, Broge, Grobe, & Wilson, 2000), positive dimensions of craving (craving the positive effects of nicotine; Doran, Cook, McChargue, & Spring, 2009), status as a current smoker (Spillane, Smith, & Kahler, 2010), and initiation of daily smoking in high school (Spillane et al., 2012). Negative and positive urgency (the tendency to engage in rash action in response to strong negative or positive affective experiences, respectively) however, are both associated with tobacco dependence (Pang et al., 2014; Spillane et al., 2010), and negative urgency is associated with dimensions of tobacco craving (craving relief from the negative effects of tobacco deprivation; Billieux, Van der Linden, & Ceschi, 2007; Doran et al., 2009). Taken together, this evidence suggests that sensation seeking is associated with tobacco initiation and status as a current smoker, whereas urgency is more closely associated with heavier use and tobacco dependence.

While there is substantial evidence that dimensions of impulsivity—particularly sensation seeking and urgency—influence consumption and problematic use patterns of cigarette use, the independent influence of these risk factors on smoking frequency (daily vs non-daily smoking) is unknown. Therefore, the objective of this study was to investigate the associations between impulsivity dimensions and smoking behavior in young adults who vary in frequency of cigarette smoking, in order to better understand risk factors associated with non-daily and daily tobacco use prior to entry into college. It was hypothesized that UPPS-P impulsivity (specifically sensation seeking and urgency) would be positively correlated with smoking frequency. In addition, when all variables were simultaneously entered in the model, it was hypothesized that sensation seeking would predict membership in the non-daily smoking group, while urgency would predict membership in daily smoking group, compared to both non-daily and non-smokers. This pattern of results would suggest that specific dimensions impulsivity primarily contribute to different forms of cigarette smoking behavior.

2. Method

2.1 Participants and Procedure

Data for this study were collected as part of a three-year longitudinal study investigating individual differences in personality and drug use among college students enrolled at a large public university. Participants were 512 young adults between the ages of 18-24 (52% female, mean age = 18.49), who were recruited from two successive freshman classes. During two consecutive academic years, all freshman students in an Introductory Psychology course were invited to provide demographic information (i.e. sex, ethnicity, home state, and home country) in an in-class screening session for class credit. Inclusion criteria included: 1) between 18 and 24 years of age, 2) willingness to participate in the longitudinal study, and 3) in-state residence. Only data from the first year of the study (Wave 1) were analyzed in the present study. The sample included individuals who identified as White (82.8%), African American (12.4%), Latino/a (1.3%), Asian American (2.0%), Native American (0.2%), and Biracial (1.3%).

Each participant completed one, 2.5-hour session that involved completion of computer-based questionnaires, behavioral tasks, and a structured interview assessing drug use. All measures were administered by extensively trained research personnel. All procedures were reviewed and approved by the Institutional Review Board at the university. For complete details on subject screening and session procedures, see Adams, Kaiser, Lynam, Charnigo, and Milich (2012), and Kaiser, Milich, Lynam, and Charnigo (2012).

2.2 Smoking Group Classification

Smoking group status was determined by using a Life History Calendar (LHC; Caspi, Moffitt, Thornton, & Freedman, 1996). The LHC is a retrospective method for collecting data on a wide range of life events and behaviors. Participants were asked to report on their substance use from age 13 to the time of the interview. Each year was divided into three four-month intervals that correspond roughly to the two semesters of the school year and the

summer. The most recent 4-month period at the time each participant completed the study was used to determine smoking group status.

Participants rated smoking frequency using a 0-5 scale: 0 = no smoking, 1 = once per month or less, 2 = once per week, 3 = two or three times per week, 4 = four or five times per week, and 5 = every day. Non-smokers (N = 399; 53% female) were defined as those who did not use cigarettes in the most recent period, and who did not report quitting smoking prior to assessment. Non-daily smokers (N = 60; 40% female) were those who reported using ≤ 5 days per week. Daily smokers (N = 41; 51 % female) reported smoking cigarettes daily. Twelve participants were daily smokers but had recently quit smoking in the most recent period and were excluded from the study, resulting in a final sample of 500.

2.3 Impulsivity

The UPPS-P Impulsive Behaviors Scale (Lynam et al., 2006; Whiteside & Lynam, 2001) is a 59-item inventory designed to measure five distinct personality pathways to impulsive behavior: negative urgency, (lack of) perseverance, (lack of) premeditation, sensation seeking, and positive urgency. Items were rated on a 4-point scale from Strongly Agree to Strongly Disagree. Average scores were calculated for each item. Internal consistency was good across all UPPS-P dimensions in the present sample (α = .82-.93).

2.4 Data Analysis

Analyses were conducted using SPSS version 21.0. Multinomial logistic regression (MLR) allows for the simultaneous examination of effects of several independent variables (UPPS-P dimensions) on a categorical variable with more than two discrete outcomes (smoking status: non-smoker, non-daily smoker, or daily smoker). The model estimated the effects of the independent variables on the log odds (or logit) of belonging to 1) either non-daily or daily smoking categories compared to the non-smoking category as a reference, and 2) daily smoking category compared to the non-daily smoking category. Coefficients for each variable were exponentiated to provide an odds-like ratio for risk of a smoking category membership compared to the reference group; this value is not a true odds ratio due to the portion of the sample being excluded for either smoking outcome (see Peng & Nichols, 2003, and Tabachnick & Fidell, 2012, for further details on the application of multinomial regression modeling to behavioral data).

3. Results

3.1 Correlations between Smoking and Impulsivity

Table 1 summarizes means, standard deviations, and correlations between study variables. In order to control for multiple comparisons, a cutoff of $p<.01$ was used to determine significance for correlations. Consistent with previous literature, UPPS-P variables are significantly intercorrelated, with few exceptions. Correlations with tobacco use categories were computed using the data from: 1) non-smokers and non-daily smokers, 2) non-smokers and daily smokers, and 3) non-daily smokers and daily smokers, with smoking status dummy-coded. Non-daily smoking, compared to non-smoking status, was correlated with all dimensions of the UPPS-P except sensation seeking and lack of perseverance, whereas daily

smoking, relative to non-smoking status, was significantly positively correlated with all dimensions of the UPPS-P. Daily smoking relative to non-daily smoking was only significantly correlated with negative urgency.

Gender (male = 1) was significantly positively correlated with sensation seeking, and positive urgency; however, gender was not significantly related to either smoking category and was thus not included in subsequent analyses. Age was not significantly different across groups, and was not correlated with any study variables; therefore, it also was not included in any subsequent analyses.

3.2 Impulsivity predicting smoking status

A MLR analysis was conducted examining the effects of impulsivity on the odds-like ratios of belonging to the two categories of smoking status, relative to being a non-smoker. Due to the high correlation between positive urgency and negative urgency and the very similar pattern correlations between these two dimensions and smoking categories (see Table 1 for all values), positive urgency was excluded from the analyses to reduce multicollinearity. The Likelihood Ratio test demonstrated significant improvement of the MLR model over the intercept-only or null model ($\chi^2 = 61.85$, $p < .001$). Statistical significance of individual predictors was tested using Likelihood Ratio tests, with negative urgency ($\chi^2 = 20.45$, $p < .001$) and (lack of) premeditation ($\chi^2 = 9.28$, $p < .01$) emerging as the only significant individual predictors in the overall model. (Lack of) perseverance ($\chi^2 = .39$, $p = .82$), and sensation seeking ($\chi^2 = 3.16$, $p = .21$) were not significant predictors of group membership.

Odds-like ratios with corresponding 95% confidence intervals for individual comparisons (e.g. non-smokers vs. non-daily smokers, non-smokers vs. daily smokers, non-daily vs. daily smokers) are presented in Table 2. When controlling for each other, (lack of) premeditation was the only UPPS dimension significantly predicting membership in the non-daily smoking group relative to non-smokers, with a one standard deviation increase in (lack of) premeditation associated with an estimated 60% increase in the likelihood of being a non-daily smoker. Negative urgency significantly predicted membership in the daily smoking group relative to non-smokers, with a one standard deviation increase in negative urgency associated with an approximately twofold increase in the likelihood of being a daily smoker relative to a nonsmoker. Negative urgency was also a significant predictor of membership in the daily smoking group relative to non-daily smokers, with a one standard deviation increase associated with a 75% increase in the likelihood of being a daily smoker, rather than a non-daily smoker.

4. Discussion

The purpose of this study was to investigate the associations between UPPS impulsivity dimensions and smoking behavior in young adults who vary in frequency of cigarette smoking. UPPS negative urgency, positive urgency, (lack of) premeditation, and (lack of) perseverance were positively correlated with both non-daily and daily smoking, whereas sensation seeking was positively correlated only with daily smoking. Consistent with our hypotheses, negative urgency predicted increased risk of membership in the daily smoking group relative to the non-smoking and non-daily smoking groups. Contrary to our

hypothesis, sensation seeking was not associated with increased risk of status as a non-daily smoker. Finally, lack of premeditation was associated with increased risk of status as a non-daily smoker, relative to status as a non-smoker. These results demonstrated that lack of premeditation is associated with non-daily smoking, while negative urgency is associated with daily smoking in the time prior to entry into college.

Entry into college is a period of increased vulnerability to tobacco use, so identifying risk factors associated with differential patterns of tobacco use in this subset of the population may help inform targeted prevention and early interventions aimed at decreasing tobacco use. One potential risk factor for transitioning to heavier patterns of tobacco use is urgency. Previous studies have identified urgency (positive and negative) as a risk factor for problematic tobacco use and dependence (e.g. Billieux et al., 2007; Doran et al., 2009; Spillane et al., 2010). In this study, negative urgency was correlated with both non-daily and daily smoking but it was uniquely associated with daily smoking, providing additional evidence for the role of negative urgency in heavier tobacco use among this subset of young adults entering into college. Other research has found that negative urgency is associated with a variety of problematic behaviors in addition to frequent smoking (e.g. aggression, risky sex, problem drinking, illegal drug use; Adams et al., 2012; Fischer & Smith, 2008; Settles et al., 2012), suggesting that behaving impulsively in response to negative affective experiences is an important factor associated with vulnerability to a variety of risk-related behaviors, including tobacco misuse and dependence.

Unexpectedly, sensation seeking was not associated with non-daily smoking, despite previous studies demonstrating that high sensation seekers experience increased reinforcement from tobacco use (Perkins et al., 2000) and non-daily smokers are motivated by positive reinforcing effects of smoking (Shiffman et al., 2012a). This may be due to a more narrowly defined construct of sensation seeking in the UPPS than in the measures used in previous research; other impulsivity instruments include elements of UPPS lack of premeditation or lack of perseverance in their sensation seeking scales. Interestingly, lack of premeditation was a unique risk factor for non-daily smoking in this study, further suggesting that disinhibition and lack of planning, rather than excitement seeking, may be greater factors in non-daily smoking. Those that are high in lack of premeditation may be more likely to smoke on occasion because they are less sensitive to the long term consequences of smoking (i.e. tobacco dependence, negative health effects).

There were several limitations to the current study that should be addressed. First, the study design was cross-sectional in nature, so we were not able to determine causal relationships between impulsivity and cigarette smoking. Though these results suggest that negative urgency may increase risk for daily use and dependence, future longitudinal and experimental research should investigate these possibilities. Second, cigarette smoking frequency was assessed using self-reported assessments, which may be subject to recall bias. Future studies should incorporate objective measures to verify smoking status. Third, the majority of daily smokers in this sample reported smoking less than half a pack of cigarettes per day. Because of this, we were unable to determine whether impulsivity varied as a function of average cigarettes per day among daily smokers. Future studies with samples including daily smokers with higher rates of daily use are needed to address this limitation.

Fourth, the study population consisted of young adult college students, so the interpretation of these results may not be generalizable to other age groups. The study sample was also predominantly white and thus lacked adequate power to examine relationships between race and the effects studied; future work should examine the impact of race and ethnicity on relations between impulsivity and smoking frequency.

5. Conclusions

Despite the limitations of the study, these results demonstrate that lack of premeditation and negative urgency are differentially associated with frequency of tobacco use in young adults. Lack of premeditation and negative urgency may be specific risk factors for the development of these patterns of smoking behavior, although longitudinal studies are needed to confirm the causal influence of UPPS impulsivity dimensions on the progression of smoking behavior (or vice versa). Given the health risks of engaging in tobacco smoking and the poor cessation rates among non-daily and daily smokers, it is important to provide effective prevention and early intervention efforts aimed at curbing problematic tobacco use. Focusing on risk factors such lack of premeditation and negative urgency and tailoring interventions based on smoking frequency may increase the effectiveness of tobacco prevention and cessation efforts.

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References

Adams ZW, Kaiser AJ, Lynam DR, Charnigo RJ, Milich R. Drinking motives as mediators of the impulsivity-substance use relation: Pathways for negative urgency, lack of premeditation, and sensation seeking. Addictive Behaviors. 2012; 37(7):848–855. [PubMed: 22472524]

Billieux J, Van der Linden M, Ceschi G. Which dimensions of impulsivity are related to cigarette craving? Addictive Behaviors. 2007; 32(6):1189–1199. [PubMed: 16997490]

Caspi A, Moffitt TE, Thornton A, Freedman D. The Life History Calendar: A research and clinical assessment method for collecting retrospective event-history data. International Journal of Methods in Psychiatric Research. 1996; 6(2):101–114.

Doran N, Cook J, McChargue D, Spring B. Impulsivity and cigarette craving: Differences across subtypes. Psychopharmacology. 2009; 207(3):365–373. [PubMed: 19756522]

Fischer S, Smith GT. Binge eating, problem drinking, and pathological gambling: linking behavior to shared traits and social learning. Personality & Individual Differences. 2008; 44(4):789–800.

Foldes SS, An LC, Rode P, Schillo BA, Davern M, Alesci NL, Kinney AM, Saul J, Zupan BA, Manley MW. The prevalence of unrecognized tobacco use among young adults. American Journal of Health Behavior. 2010; 34(3):309–321. [PubMed: 20001188]

Henningfield JE, Benowitz NL, Connolly GN, Davis RM, Gray N, Myers ML, Zeller M. Reducing tobacco addiction through tobacco product regulation. Tobacco Control. 2003; 13(2)

Kaiser AJ, Milich R, Lynam DR, Charnigo RJ. Negative urgency, distress tolerance, and substance abuse among college students. Addictive Behaviors. 2012; 37(10):1075–1083. [PubMed: 22698894]

Lipkus IM, Barefoot JC, Williams RB, Siegler IC. Personality measures as predictors of smoking initiation and cessation in the UNC alumni heart study. Health Psychology. 1994; 13(2):149–155. [PubMed: 8020458]

Lynam, DR.; Smith, GT.; Whiteside, SP.; Cyders, MA. The UPPS-P: assessing five personality pathways to impulsive behavior (Technical Report). Purdue University; West Lafayette: 2006.

Lynam DR, Miller JD. Personality pathways to impulsive behavior and their relations to deviance: Results from three samples. Journal of Quantitative Criminology. 2004; 20(4):319–341.

Pang RD, Hom MS, Geary BA, Doran N, Spillane NS, Guillot CR, Leventhal AM. Relationships between trait urgency, smoking reinforcement expectancies, and nicotine dependence. Journal of Addictive Diseases. 2014; 33(2):83–93. [PubMed: 24784229]

Peng CJ, Nichols RN. Using multinomial logistic models to predict adolescent behavioral risk. Journal of Modern Applied Statistical Methods. 2003; 2(10):1–13. Retrieved from: http://www.commrd.nccu.edu.tw/material/photo/pdf/jmasm.pdf.pdf.

Perkins KA, Gerlach D, Broge M, Grobe JE, Wilson A. Greater sensitivity to subjective effects of nicotine in nonsmokers high in sensation seeking. Experimental and Clinical Psychopharmacology. 2000; 8:462–471. [PubMed: 11127418]

Perkins K, Lerman C, Coddington S, Jetton C, Karelitz J, Scott J, Wilson A. Initial nicotine sensitivity in humans as a function of impulsivity. Psychopharmacology. 2008; 200(4):529–544. [PubMed: 18604520]

Schane RF, Glantz SA, Ling PM. Nondaily and social smoking. Archives of Internal Medicine. 2009; 169(19):1742–1744. [PubMed: 19858429]

Schane RE, Ling PM, Glantz SA. Health effects of light and intermittent smoking. Contemporary Reviews in Cardiovascular Medicine. 2010; 121(13):1518–1522.

Settles RE, Cyders MA, Gunn RL, Fischer S, Combs JL, Smith GT. Negative urgency: A personality predictor of externalizing behavior characterized by neuroticism, low conscientiousness, and disagreeableness. Journal of Abnormal Psychology. 2012; 121(1):160–172. [PubMed: 21859164]

Shiffman S, Paty J. Smoking patterns and dependence: Contrasting chippers and heavy smokers. Journal of Abnormal Psychology. 2006; 115(3):509–523. [PubMed: 16866591]

Shiffman S. Light and intermittent smokers: Background and perspective. Nicotine and Tobacco Dependence. 2009; 11(2):122–125.

Shiffman S, Dunbar MS, Scholl SM, Tindle HA. Smoking motives of daily and non-daily smokers: A profile analysis. Drug and Alcohol Dependence. 2012a; 126:362–368. [PubMed: 22784601]

Shiffman S, Ferguson SG, Dunbar MS, Scholl SM. Tobacco dependence among intermittent smokers. Nicotine & Tobacco Research. 2012b; 14(11):1372–1381. [PubMed: 22529224]

Smith GT, Fischer S, Cyders MA, Annus AM, Spillane NS, McCarthy DM. On the validity and utility of discriminating among impulsivity-like traits. Assessment. 2007; 14(2):155–170. [PubMed: 17504888]

Spillane NS, Smith GT, Kahler CW. Impulsivity-like traits and smoking behavior in college students. Addictive Behaviors. 2010; 35(7):700–705. [PubMed: 20381971]

Spillane NS, Muller CJ, Noonan C, Goins R, Mitchell CM, Manson S. Sensation-seeking predicts initiation of daily smoking behavior among American Indian high school students. Addictive Behaviors. 2012; 37(12):1303–1306. [PubMed: 22958862]

Substance Abuse and Mental Health Services Administration. Results from the 2011 National Survey on Drug Use and Health: Summary of National Findings. Substance Abuse and Mental Health Services Administration; Rockville, MD: 2012. NSDUH Series H-44, HHS Publication No. (SMA) 12-4713

Tabachnick, BG.; Fidell, LS. Using Multivariate Statistics. 6th Edition. Pearson; 2012.

Tindle HA, Shiffman S. Smoking cessation behavior among intermittent smokers versus daily smokers. American Journal of Public Health. 2011; 101(7):e1–e3. [PubMed: 21566030]

VanderVeen JW, Cohen LM, Watson NL. Utilizing a multimodal assessment strategy to examine variations of impulsivity among young adults engaged in co-occurring smoking and binge drinking behaviors. Drug & Alcohol Dependence. 2013; 127(1-3):150–155. [PubMed: 22818514]

Wechsler H, Rigotti N, Gledhill-Hoyt J, Lee H. Increased levels of cigarette use among college students. The Journal of American Medical Association. 1998; 280(19):1673–1678.

White HR, Bray BC, Fleming CB, Catalano RF. Transitions into and out of light and intermittent smoking during emerging adulthood. Nicotine & Tobacco Research. 2009; 11(2):211–219. [PubMed: 19246434]

Whiteside SP, Lynam DR. The five factor model and impulsivity: Using a structural model of personality to understand impulsivity. Personality and Individual Differences. 2001; 30:669–689.

Manuscript Highlights

- We examined the association between UPPS impulsivity and smoking in young adults.
- All UPPS dimensions were positively correlated with daily smoking.
- Lack of premeditation was uniquely associated with non-daily smoking.
- Negative urgency was uniquely associated with daily smoking.

Table 1

Correlations between study variables and descriptive statistics (N = 500, except where noted)

	NU	PRE	PER	SS	PU	Male	Mean	SD
NU							2.23	0.55
PRE	.39***						2.00	0.45
PER	.32***	.38***					1.85	0.43
SS	.09	.36***	.03				3.00	0.54
PU	.73***	.47***	.32***	.25***			1.85	0.57
Male	.01	.08	.06	.30***	.16**			
ND vs. NS (n=460)	.15**	.20***	.10	.09	.14**	.09		
D vs. NS (n=441)	.28***	.24***	.15**	.14**	.25***	.01		
D vs. ND (n=103)	.26**	.11	.11	.11	.24	.11		

Note: NU = negative urgency, PRE = (lack of) premeditation, PER = (lack of) perseverance, SS = sensation seeking, PU = positive urgency, NS = non-smoker status, ND = non-daily smoker status, D = daily-smoker status

** $p < .01$,

*** $p < .001$ for all tables

Table 2

Odds-like ratios (with 95% confidence intervals) for UPPS-P factors (standardized values) predicting non-daily and daily smoking statuses relative to non-smoking and predicting daily relative to non-daily smoking.

Category	Predictors	Exp(B)	95% CI	p-value
Non-Daily relative to Non-Smokers	NU	1.33	0.97 – 1.81	.076
	PRE	**1.59****	**1.14 – 2.23**	**.007**
	PER	1.04	0.76 – 1.41	.828
	SS	1.09	0.80 – 1.48	.601
Daily relative to Non-Smokers	**NU**	**2.32*****	**1.57 – 3.42**	**<.001**
	PRE	1.45	0.96 – 2.18	.075
	PER	1.12	0.78 – 1.61	.538
	SS	1.41	0.96 – 2.08	.083
Daily relative to Non-Daily	**NU**	**1.75***	**1.11-2.76**	**.016**
	PRE	0.91	.56-1.47	.696
	PER	1.08	.71-1.66	.716
	SS	1.30	.82-2.05	.266

Note: NU = negative urgency, PRE = (lack of) premeditation, PER = (lack of) perseverance, SS = sensation seeking, Non-daily = non-daily smoker status, Daily = daily smoker status