Original Investigation

Smoking Desistance and Personality Change in Emerging and Young Adulthood

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Abstract

Introduction: We attempted to replicate and extend (Welch, P., & Poulton, R. [2009]. Personality influences on change in smoking behavior. *Health Psychology*, 28, 292–299. doi:10.1037/a0013471) findings regarding the relationship between smoking involvement and personality change.

Methods: Two time frames (18–25, 18–35) in a cohort of college students ($N = 489$ at baseline) followed for 17 years were used. Impulsivity, neuroticism, and 4 measures of smoking involvement were assessed at each time point.

Results: Individuals who desisted in smoking involvement tended to exhibit the largest decreases in neuroticism and impulsivity from ages 18 to 25. From ages 18 to 35, changes in smoking involvement were only significantly associated with changes in impulsivity.

Conclusions: These findings add to the literature demonstrating decreasing neuroticism, and impulsivity correlates with decreased substance involvement during emerging adulthood.

Introduction

Several studies have linked specific personality traits with tobacco use and tobacco dependence (for a summary of findings, see Welch & Poulton, 2009, and for a thorough discussion, see Littlefield & Sher, in press). However, it is only recently that individual differences in personality change have been linked to longitudinal patterns of tobacco use. Welch and Poulton (2009) demonstrated that personality change between ages 18 and 26 was associated with change in smoking status. Individuals who quit smoking during this timeframe showed steeper decreases in negative emotionality (i.e., neuroticism) and larger increases in constraint (broadly, the antithesis of impulsivity) compared with others (i.e., nonsmokers, onsetting smokers, persisting smokers). Interestingly, these findings parallel research that suggests individuals who “mature out” (Winick, 1962) of alcohol problems during emerging and young adulthood exhibit pronounced decreases in impulsivity and neuroticism (Littlefield, Sher, & Steinley, 2010; Littlefield, Sher, & Wood, 2009).

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The current study sought to replicate and extend the findings reported by Welch and Poulton (2009). In order to test the replicability of these findings, the relation between changes in smoking status and the personality traits of neuroticism and impulsivity from ages 18 to 25 are examined. Extending the findings of Welch and Poulton, the association between changes in these personality traits and changes in three other indices of smoking involvement (i.e., near-daily smoking and two measures of tobacco dependence) are also tested. The link between changes in all indices of smoking involvement and the two personality traits are also examined from ages 18 to 35 (the length of time participants were followed).

Methods

Participants and Procedure

Data were taken from a longitudinal study on family history (FH) of alcoholism as well as other correlates of alcohol use disorders (for a full description of the study, see Sher, Walitzer, Wood, & Brent, 1991). The baseline sample consisted of 489 first-year college students (46% male, mean age = 18.2 years) from a large Midwestern university. Half (51%) of the respondents were classified as FH positive (FH+; for more details, see Sher et al., 1991). Respondents were prospectively assessed seven times over 17 years (roughly at ages 18, 19, 20, 21, 25, 29, and 35) by both interview and paper-and-pencil questionnaire. The personality measures employed in the current study (see “Measures” section) were assessed at ages 18, 25, 29, and 35, and thus these four assessment waves were used for the current analyses. Overall retention was good, with more than 84% of participants retained over the first 11 years of the study, and more than 78% retained through Year 17 (mean age = 34.5 years).

Measures

Personality

Neuroticism was assessed from the Eysenck Personality Questionnaire (Eysenck & Eysenck, 1975) at baseline (age 18) and subsequently at years 7, 11, and 17 (roughly corresponding to ages 25, 29, and 35, respectively). A sum of 10 items were used to assess impulsivity at the same time points as neuroticism. Six of these items were drawn from the short form of the

Tridimensional Personality Questionnaire (Sher, Wood, Crews, & Vandiver, 1995), and the remaining four items were taken from the Eysenck Personality Inventory (Eysenck & Eysenck, 1968). Internal consistency, as measured by coefficient alpha (α), ranged from .85 to .88 for neuroticism and .75 to .81 for impulsivity (for more details, see Littlefield, Sher, & Wood, 2009).

Smoking Involvement

Four indices of past-year smoking involvement were assessed at each wave. Similar to Welch and Poulton (2009), smoking status was determined by responses to the question "On an average day when you do smoke, how many cigarettes do you smoke?"; those who responded "None at all (I don't smoke)" were coded as nonsmokers at that age whereas remaining participants were classified as smokers.

Near-daily smoking (i.e., frequent smoking) was assessed at each wave with the item "How often do you smoke cigarettes currently?"; participants who reported smoking 3–4 days a week (or more frequently) were coded as near-daily smokers, and the remaining participants were coded as nonfrequent smokers.

Two separate indices of smoking dependence were used in the current study. Self-perceived tobacco dependence was assessed with the item "Have you ever felt that you needed tobacco or that you were dependent on it (by tobacco, we mean cigarettes, cigars, pipe tobacco, chewing tobacco, or snuff)?"; individuals who responded "Yes, in the past year" were considered to be dependent whereas remaining individuals were regarded as nondependent. Tobacco use disorders were assessed with the Diagnostic Interview Schedule (Robins, Helzer, Cottler, & Goldring, 1985; Robins, Helzer, Croughan, Williams, and Spitzer, 1989; for more details, see Jackson, Sher, & Wood, 2000; Sher, Gotham, Erickson, & Wood, 1996).

Problematic Alcohol Involvement

A sum of 27 items consisting of both negative consequences associated with drinking and symptoms related to alcohol dependence were calculated at each wave. Items were based on items from the Michigan Alcoholism Screening Test (Selzer, 1971), and additional items were generated to produce a comprehensive list of negative consequences of alcohol consumption and dependence symptomatology (see Sher et al., 1991; items available upon request). Participants were asked if in the past year they had experienced alcohol-related consequences/symptoms. Internal consistency ranged from .87 to .90 (for more details, see Littlefield et al., 2009).

Analytic Procedure

For each smoking involvement measure, four groups were created based on responses at baseline (i.e., age 18) and follow-up (either age 25 or age 35): abstainers/nondependents (no reported smoking/dependence at both times), onsetters (smoking/dependence at follow-up but not baseline), desisters (smoking/dependence at baseline but not follow-up), and persisters (smoking/dependence at both times). A series of repeated-measures analyses (the four smoking groups $\times$ wave [the repeated measure]) were then conducted (using SAS PROC MIXED) to compare developmental differences among the smoking groups in two measures of personality. Sex was modeled as a fixed covariate in all analyses. Mean changes in personality were compared

among smoking groups between ages 18–25 and ages 18–35 (using assessments at 18 and 35), with a particular focus on desisters versus all other smoking involvement groups. That is, in addition to the omnibus time by smoking involvement group interactions, we also conducted a priori contrasts comparing desisters with the other smoking involvement groups. For the analyses comparing ages 18 and 35, we also conducted contrasts to illuminate the nature of significant time by smoking involvement group interactions.

Results

From ages 18 to 25, the number of participants for each of smoking involvement groups for each smoking outcome were as follows—smoking status: abstainers = 267, onsetters = 49, desisters = 49, persisters = 84; near-daily smoking: abstainers = 359, onsetters = 40, desisters = 13, persisters = 37; perceived tobacco dependence: nondependents = 326, onsetters = 55, desisters = 22, persisters = 46; tobacco use disorder: nondependents = 363, onsetters = 48, desisters = 17, persisters = 29. From ages 18 to 35, the number of participants for each of smoking involvement groups for each smoking outcome were as follows—smoking status: abstainers = 233, onsetters = 30, desisters = 50, persisters = 57; near-daily smoking: abstainers = 308, onsetters = 24, desisters = 18, persisters = 21; perceived tobacco dependence: nondependents = 284, onsetters = 33, desisters = 34, persisters = 20; tobacco use disorder: nondependents = 319, onsetters = 28, desisters = 20, persisters = 16.

Are Changes in Smoking Involvement Associated With Changes in Personality Traits From Ages 18 to 25?

Neuroticism

Significant omnibus time by smoking involvement group interactions were found for smoking status, $F(3, 444) = 4.53, p < .01$, near-daily smoking, $F(3, 444) = 3.01, p < .05$, and perceived tobacco dependence, $F(3, 444) = 4.44, p < .01$, but not for tobacco use disorder, $F(3, 452) = 0.63, p = .59$. Follow-up contrasts of these interactions showed desisters, compared with all other tobacco groups, exhibited the steepest declines in neuroticism from ages 18 to 25 ($p < .02$ for all contrasts; see Table 1).

Notably, further analyses that adjusted for alcohol problems resulted in nonsignificant time by smoking involvement group interactions (smoking status $F(3, 444) = 1.90, p = .06$, near-daily smoking $F(3, 444) = 2.14, p = .09$, and perceived tobacco dependence $F(3, 444) = 1.90, p = .13$), suggesting that changes in alcohol problems, smoking involvement, and personality change are related processes during this timeframe.

Impulsivity

No significant omnibus time by smoking involvement group interactions were found for any smoking involvement measure (smoking status $F(3, 444) = 0.35, p = .79$, near-daily smoking $F(3, 444) = 1.88, p = .13$, perceived tobacco dependence $F(3, 444) = 1.32, p = .27$, tobacco use disorder $F(3, 452) = 1.14, p = .33$). Despite these nonsignificant omnibus interactions, desisters tended to display the largest decreases in impulsivity from ages 18 to 25 (see Table 1). Indeed, specific contrasts suggested that desisters of near-daily smoking, $F(1, 444) = 4.40$,

Table 1. Means (SE) for Neuroticism and Impulsivity by Smoking Involvement Group and Age

	Smoking status				Near-daily smoking			
	18–25 (N= 449)		18–35 (N= 370)		18–25 (N= 449)		18–35 (N= 371)	
	18	25	18	35	18	25	18	35
	Mean (SE)							
Neuroticism								
Abstainers/ND	8.40 (0.29)	7.60 (0.31)	8.56 (0.32)	7.19 (0.33)	9.02 (0.25)	7.79 (0.27)	8.99 (0.28)	7.28 (0.29)
Onsetters	9.57 (0.68)	8.38 (0.74)	8.48 (0.89)	6.78 (0.95)	9.46 (0.77)	9.44 (0.82)	10.50 (1.01)	8.28 (1.05)
Desisters	11.45 (0.68)	8.05 (0.74)	11.77 (0.69)	8.74 (0.73)	13.41 (1.35)	9.18 (1.44)	13.29 (1.16)	10.90 (1.21)
Persisters	10.88 (0.52)	9.26 (0.56)	11.01 (0.64)	8.53 (0.68)	10.62 (0.8)	8.67 (0.85)	9.88 (1.08)	8.12 (1.12)
Impulsivity								
Abstainers/ND	4.47 (0.17)	3.32 (0.16)	4.55 (0.18)	2.99 (0.16)	4.56 (0.14)	3.41 (0.14)	4.55 (0.16)	3.03 (0.14)
Onsetters	4.91 (0.40)	3.75 (0.39)	4.50 (0.52)	3.40 (0.45)	5.31 (0.44)	3.81 (0.43)	5.24 (0.58)	3.40 (0.50)
Desisters	5.38 (0.40)	3.79 (0.39)	4.67 (0.40)	2.93 (0.34)	7.17 (0.78)	4.09 (0.76)	6.07 (0.67)	2.57 (0.58)
Persisters	5.61 (0.31)	4.25 (0.30)	5.93 (0.37)	3.20 (0.32)	6.16 (0.46)	4.94 (0.45)	6.38 (0.62)	3.38 (0.53)
	Subjective TD				TUD			
	18–25 (N = 449)		18–35 (N = 371)		18–25 (N = 457)		18–35 (N = 383)	
	18	25	18	35	18	25	18	35
	Mean (SE)							
Neuroticism								
Abstainers/ND	8.82 (0.14)	7.70 (0.14)	8.76 (0.29)	7.15 (0.30)	8.98 (0.25)	7.66 (0.27)	9.08 (0.27)	7.26 (0.29)
Onsetters	9.25 (0.41)	8.69 (0.40)	10.60 (0.85)	9.12 (0.89)	10.26 (0.70)	9.54 (0.76)	9.86 (0.93)	8.61 (0.97)
Desisters	12.72 (0.69)	8.13 (0.68)	12.22 (0.84)	9.34 (0.88)	10.55 (1.18)	9.74 (1.28)	13.87 (1.10)	10.70 (1.20)
Persisters	11.32 (0.52)	9.71 (0.51)	10.73 (1.10)	7.93 (1.15)	12.23 (0.90)	10.05 (0.97)	10.98 (1.23)	8.89 (1.31)
Impulsivity								
Abstainers/ND	4.55 (0.15)	3.35 (0.15)	4.52 (0.16)	2.99 (0.14)	4.60 (0.14)	3.37 (0.14)	4.64 (0.16)	3.05 (0.13)
Onsetters	4.92 (0.38)	3.79 (0.37)	4.91 (0.49)	3.12 (0.42)	5.39 (0.41)	4.34 (0.40)	5.15 (0.54)	3.65 (0.46)
Desisters	6.10 (0.60)	3.64 (0.58)	5.43 (0.48)	3.04 (0.42)	6.31 (0.69)	3.84 (0.68)	5.91 (0.64)	2.69 (0.57)
Persisters	6.13 (0.41)	5.04 (0.40)	6.91 (0.63)	3.90 (0.55)	6.19 (0.52)	5.33 (0.51)	6.44 (0.71)	2.88 (0.63)

Note. ND = nondependents; TD = tobacco dependence; TUD = tobacco use disorder.

$p < .05$, and perceived tobacco dependence, $F(1, 444) = 3.92$, $p < .05$, demonstrated the largest decreases in impulsivity from ages 18 to 25 compared with other smoking involvement groups. There was also a nonsignificant trend suggesting that desisters of tobacco use disorders showed pronounced decreases in impulsivity, $F(1, 452) = 3.34$, $p = .07$. However, the significant contrasts were no longer significant when adjusted for alcohol problems (near-daily smoking $F(1, 444) = 1.53$, $p = .22$, perceived tobacco dependence $F(1, 452) = 2.28$, $p = .13$).

Are Changes in Smoking Involvement Associated With Changes in Personality Traits From Ages 18 to 35?

Neuroticism

No omnibus significant time by smoking involvement group interactions were found for any smoking involvement measure (smoking status $F(3, 365) = 1.66$, $p = .18$, near-daily smoking $F(3, 366) = 0.15$, $p = .93$, perceived tobacco dependence $F(3, 366) = 0.83$, $p = .48$, tobacco use disorder $F(3, 378) = 0.48$, $p = .70$). Follow-up analyses comparing desisters with all other smoking involvement groups were also nonsignificant.

Impulsivity

Significant time by smoking involvement group interactions were found for smoking status, $F(3, 365) = 2.72$, $p = .04$, near-daily smoking, $F(3, 366) = 3.86$, $p < .01$, and tobacco use disorder, $F(3, 378) = 3.67$, $p = .01$, but not for perceived tobacco dependence, $F(3, 366) = 2.09$, $p = .10$. For smoking status, follow-up contrasts indicated that individuals who reported smoking at both ages 18 and 35 (i.e., persisters) compared with all other individuals, exhibited the steepest declines in impulsivity from ages 18 to 35 ($p < .01$), ending up with impulsivity levels similar to those in the other smoking groups despite being significantly higher at baseline (see Table 1). For near-daily smoking, the patterns of means were similar except that desisters and persisters had more similar levels of impulsivity at age 18 and made similar mean changes across time (see Table 1). Follow-up contrasts for near-daily smoking suggested that these individuals (i.e., near-daily offsetters and persisters) demonstrated steeper decreases in impulsivity from ages 18 to 35 compared with individuals who did not smoke at age 18 ($p < .01$). For tobacco use disorders, follow-up contrasts suggested that dependents (i.e., offsetters, desisters, persisters) exhibited sharper decreases in impulsivity from ages 18 to 35 compared with nondependents ($p < .01$; see Table 1). Further analyses that

adjusted for alcohol problems resulted in nonsignificant time by smoking involvement group interactions for smoking status, $F(3, 365) = 2.31, p = .08$.

Discussion

Welch and Poulton (2009) reported that individuals who quit smoking between ages 18 and 26 exhibited pronounced decreases in neuroticism and increases in constraint during this timeframe. The current results replicate and extend findings of Welch and Poulton regarding neuroticism and to a lesser extent constraint, by demonstrating that the largest decreases in neuroticism and impulsivity from ages 18 to 25 tended to occur in individuals who reduced or stopped smoking or no longer felt dependent on tobacco across the same timeframe. These findings are similar to those we have found in this dataset demonstrating that pronounced decreases in impulsivity and neuroticism are related to steeper declines in alcohol problems during emerging adulthood (Littlefield et al., 2009, 2010). Indeed, follow-up analyses adjusting for alcohol problems typically resulted in nonsignificant time by smoking involvement group interactions, suggesting that changes in alcohol problems, smoking involvement, and personality change are related processes, especially from ages 18 to 25.

When we studied a longer developmental period from ages 18 to 35, a different picture emerged. Only changes in impulsivity significantly related to patterns of smoking involvement, such that smokers at age 18 (who typically were higher in impulsivity than nonsmokers at age 18) tended to display the steepest declines in impulsivity across this timeframe. Therefore, individuals with heightened levels of impulsivity during emerging adulthood may be more likely to engage in a range of externalizing behaviors, including smoking. However, given that levels of impulsivity were generally similar across smoking involvement groups at age 35, smoking during the fourth decade of life may primarily reflect highly dependent use that may be unrelated to impulsivity. Recent work has identified four key smoking motives (automaticity, craving, loss of control, and tolerance) that are core elements of smoking dependence and appear to be relatively independent of conscious control (Piper et al., 2008). Highly automated behaviors may be relatively unaffected by the deliberative processes that the current impulsivity measure assessed; that is, as the individual becomes progressively more dependent, his substance use may become more "compulsive" and less "impulsive" (Everitt & Robbins, 2005).

Overall, our findings indicate that the degree to which personality change accompanies change in tobacco use and dependence varied by the trait under investigation and the developmental timeframe and/or stage of smoking career under consideration. Consistent with the conclusions from Welch and Poulton (2009), these findings suggest that antismoking approaches targeting personality change during emerging adulthood may facilitate smoking cessation. However, it is important to note that these analyses do not establish a causal relation between personality change and smoking involvement or vice versa. As we have noted in our examinations of correlated change between alcohol-related problems and personality (Littlefield et al., 2009) and consistent with other researchers examining the relation

between personality change and other outcomes (Scollon & Diener, 2006), the developmental processes involved in the correlated changes between personality and substance involvement is most likely a complex relationship that involves both genetic and environmental factors. Therefore, though speculatively approaches targeting personality may promote smoking cessation, the current data do not speak to the temporal precedence of the association between changes in smoking involvement and personality.

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Declaration of Interests

None declared.

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