

Explaining Relapse Vulnerability in Subjects with Tobacco Use Disorder: Inhibitory Control and Emotion Regulation

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Background: Tobacco use disorder (TUD), like other substance use disorders, is associated with deficits in inhibitory control (IC) – the ability to inhibit a prepotent motor response – and heightened negative affect. Both of these factors precipitate smoking. The present study sought to examine the effects of inhibitory control and negative emotion regulation on two aspects of smoking relapse vulnerability: latency to engage in smoking and number of puffs taken.

Methods: Smokers (n=145) and non-smoker controls (n=213) performed an inhibitory control and negative emotional regulation (ER) task. Smokers also completed a laboratory-based smoking relapse analog task (SRT), which involved receiving monetary incentive to refrain from smoking while in the presence of smoking cues. Data were analyzed with T-tests and a repeated measures ANOVA to examine smoker and non-smoker differences. Survival analysis was utilized to examine smoking latency as a function of inhibitory control.

Results: ER efficacy was worse for smokers, as compared to non-smokers ($p=0.012$). Additionally, IC task performance was lower among smokers at a trend level ($p=0.126$). Among smokers, IC was positively associated with longer latency to smoke on the SRT ($p=0.005$). Among those who elected to smoke, ER efficacy was associated with taking fewer puffs ($p=0.023$).

Conclusions: These results suggest that IC (one form of reactive control) and negative ER (one form of proactive control) may differentially maintain aspects of smoking behavior. While IC may be particularly important in a smoker's ability to inhibit smoking, negative ER may play a critical role in smoking compulsivity. The findings may help guide models of lapse and full-blown relapse vulnerability which have implications for tailoring TUD treatment.