Impulsivity related personality traits and cigarette smoking in adults: A meta-analysis using the UPPS-P model of impulsivity and reward sensitivity

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Background
Impulsivity, a tendency to engage rapidly in behaviour without adequate consideration of the potential consequences, influences all aspects of smoking behaviour. However, identifying the role of impulsivity in all stages of tobacco use has been challenging because of variation in how impulsivity is defined. Impulsivity is a multi-dimensional construct and personality researchers have identified five different personality dispositions to engage in rash or impulsive action: negative urgency, a tendency to act rashly in response to negative mood; positive urgency, a tendency to act rashly when experiencing intensely positive mood; lack of premeditation, a tendency to act without thinking; lack of perseverance, an inability to remain focused on a task; and sensation seeking, a tendency to seek out exciting, novel experiences. Measurement of separate aspects of impulsivity using the UPPS-P framework can clarify the variation observed when using more general measures of trait impulsivity. However, one limitation of the UPPS framework is that it does not include a measure of reward sensitivity, which refers to an elevated sensitivity to conditioned and unconditioned rewarding stimuli.

Aims
- To review research in order to examine the direction and magnitude of the relationship between impulsivity and both cigarette smoking and nicotine dependence in adults.
- To delineate differences in effects between specific impulsivity-related traits, namely lack of premeditation, lack of perseverance, sensation seeking, negative urgency, positive urgency and reward sensitivity, and both cigarette smoking and nicotine dependence in adults.
- To test whether age, gender, ethnicity, sample type and study type moderate any relationships.
- To highlight gaps in the existing research that future studies could address.

Method

Flowchart for study selection

- Records online database search n=732
- Records ancestry search n=13
- Records screened by abstract n=362
- Relevant full-text articles assessed for eligibility n=210
- Studies included in meta-analyses n=97
- Studies excluded for the following reasons:
  - Sample mean age outside of specified range n=14
  - Measure nicotine abstinence n=27
  - No tobacco measure n=4
  - Results on impulsivity and other than smoking outcome n=44
  - Same sample as other included study n=7
  - Not normally distributed data n=2
  - Not report sufficient data to calculate effect size n=27

Results
- Ninety-seven studies were meta-analysed using random effects models to examine the relationship between impulsivity-related traits and cigarette smoking and nicotine dependence.

  > Impulsivity was associated with an increased likelihood of being a smoker than a non-smoker (n=0.19) and greater nicotine dependence (n=0.12).
  
  > Cigarette smoking and nicotine dependence were significantly associated with all impulsivity-related traits except reward sensitivity.
  
  > Lack of premeditation and positive urgency showed the largest associations with cigarette smoking (n=0.20, n=0.24 respectively).
  
  > Positive urgency showed the largest association with nicotine dependence (n=0.23).
  
  > Study design moderated associations between lack of premeditation and lack of perseverance and smoking, with larger effects found in cross-sectional compared to prospective studies.

Conclusions
- Findings suggest that:
  - Impulsivity-related traits are more strongly associated with cigarette smoking than nicotine dependence.
  - Smokers are more impulsive than non-smokers.
  - Impulsivity is positively associated with nicotine dependence.
  - Separate impulsivity-related traits show modest differences in patterns of association with cigarette smoking and nicotine dependence in adults.
  - There seems to be a lack of research examining smoking status and nicotine dependence with positive urgency and reward sensitivity.
  - Understanding the complexity of impulsivity-related traits in relation to smoking can help to identify potential smokers and could inform smoking cessation treatment plans.

References

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