

# 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<sup>1</sup>, influences all aspects of smoking behaviour<sup>2-4</sup>. However, identifying the role of impulsivity in all stages of tobacco use has been challenging because of variation in how impulsivity is defined.

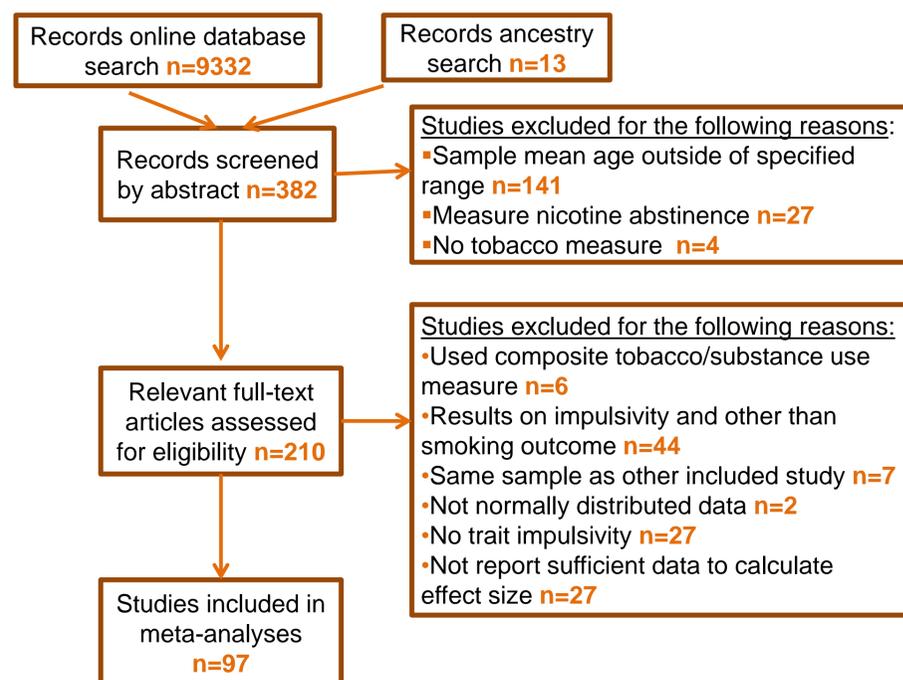
Impulsivity is a multi-dimensional construct and personality researchers have identified five different personality dispositions to engage in rash or impulsive action: negative urgency, a tendency to act rashly in response to negative mood; positive urgency, a tendency to act rashly when experiencing 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 (UPPS-P model of impulsivity)<sup>5-6</sup>. 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-P 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



### Literature search:

- Online databases (PubMed, PsychoINFO, Medline, EBSCO Academic Search Complete, Elsevier Science Direct, Google Scholar)
- Ancestry search
- Authors contacted by email with a request for unpublished data

### Key words: combination of two categories

- Category 1 : Impulsiv\*, disinhibition, premeditation, sensation seeking, novelty seeking, behavioural approach, behavioural, reward drive, urgency, negative urgency, positive urgency, perseverance, boredom proneness, boredom susceptibility, lack of planning
- Category 2: smok\*, nicotine, cigarette, tobacco

- Articles published up to November 2016

### Inclusion criteria

- Contain empirical measurement of both self-report of impulsivity, reward sensitivity and smoking
- Utilize measures of impulsivity that mapped onto the UPPS-P model and reward sensitivity
- Refer to cigarette use and not other forms of tobacco use
- Sample=adults (age 18 and over)
- English language
- Studies report sufficient data to calculate effect sizes

## 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 ( $r=0.19$ ) and greater nicotine dependence ( $r=0.12$ ).

➤ 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** ( $r=0.20$ ,  $r=0.24$  respectively)

➤ **Positive urgency** showed the largest association with **nicotine dependence** ( $r=0.23$ ).

➤ **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.

Smoking Status	No of studies	N	Effect size
All traits	85	44,049	0.19
Lack of premeditation	52	20,129	0.20
Lack of perseverance	20	4,443	0.18
Sensation Seeking	53	27,566	0.19
Negative Urgency	11	5,498	0.19
Positive Urgency	4	1,305	0.24
Reward Sensitivity	6	5,140	0.01

Nicotine Dependence	No of studies	N	Effect size
All traits	30	4,145	0.12
Lack of premeditation	17	2,358	0.10
Lack of perseverance	6	970	0.05
Sensation Seeking	17	2,183	0.11
Negative Urgency	5	747	0.15
Positive Urgency	3	449	0.23
Reward Sensitivity	4	477	0.03

## References

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