

Development of an Australian E-cigarette Picture Set to aid Neurocognitive Research

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Introduction: Nicotine e-cigarette/vape use has risen significantly in Australia. Addiction research is expanding towards the development of novel therapies that modify maladapted neurobiology. To facilitate comprehensive neurocognitive research (including functional neuroimaging), a validated set of e-cigarette stimuli is essential. To date, no e-cigarette picture set is available for the Australian context.

Methods: We developed a large Australian-specific picture set incorporating photographs of e-cigarettes and non-e-cigarette (neutral) stimuli in passive, active and contextual settings. An online cross-sectional survey (July-September 2025) employed a Balanced Incomplete Block Design to obtain normative ratings for the image set. Eligible participants were ≥ 18 years, needed to reside in Australia and report e-cigarette use in the past 30 days. Images were rated on dimensions of recognition, urge to vape, valence, and arousal.

Results: Of the 449 photographs captured, 199 were removed due to factors of visual similarity, low quality, or inclusion of other substance cues. Final images (250) were randomised into 10 balanced blocks of 25 images each. Participants (N=373) had a mean age of 37.5 years (12.4 SD), 214 (57.4%) were female, 297 (79.6%) Australian born, 174 (46.6%) tertiary educated and 20 (5.4%) identified as Aboriginal and/or Torres Strait Islander. Mean E-cigarette Dependence Scale 4-item (EDS-4) score was 8.15 (3.64 SD; possible scores 0-16); 213 (57.1%) had 20-100 average puffs/day in the past 30, and 228 (61.1%) were not current cigarette smokers. Vape images elicited higher urge-to-vape, valence and arousal ratings than non-vape images, with stronger cue-reactivity observed among participants with higher EDS-4 scores.

Discussions and Conclusions: The picture-set is an important resource contribution to neurocognitive research and will be made available free for use.

Implications on practice: This resource can be utilised in experimental paradigms to further our understanding of the cognitive processes involved in this field and aid the development of disease-modifying treatments.

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