NICOTINE DEPRIVATION INDUCES NEGATIVE AFFECT TO ACTUAL CIGARETTES BUT NOT PICTURES OF CIGARETTES
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BACKGROUND AND SIGNIFICANCE

Responses to drug cues have long played a prominent role in theories of addiction, yet cue-reactivity continues to prove difficult to manipulate and measure in the lab. Pictures of drugs and drug use are amenable to precise control in experimental designs that employ psychophysiological measures. However, the motivational properties of these visual cues may differ in magnitude and salience relative to actual (in vivo) multisensory drug exposure.

Nicotine deprivation does not affect the startle response, a measure of negative affect, to unpleasant or smoking-related pictures. Perceived availability or opportunity to use drugs can influence motivationally relevant responses to drug cues (e.g., craving and affect).

AIMS AND HYPOTHESES

• Examine whether nicotine deprivation alters the startle response during exposure to actual lit cigarettes that are either available or unavailable to smoke.
• Confirm that nicotine deprivation does not alter the startle response to pictures of either unpleasant or smoking-relevant content.

METHOD

Participants

Forty-three cigarette smokers from the community completed two lab sessions:

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<th>Inclusion criteria:</th>
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<td>21 – 65 years old</td>
<td>Current smoking cessation treatment</td>
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<td>≥15 cigarettes/day for &gt;1 year</td>
<td>Strong desire to quit smoking</td>
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<td>≥150ppm expired carbon monoxide (CO)</td>
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Both laboratory sessions were identical except all participants smoked one cigarette at the start of the screening session. At the screening session participants were randomly assigned to a smoking group for the experimental session:

- Deprived Smokers (N = 21): 24 hours nicotine & tobacco abstinence
- Non-Deprived Smokers (N = 22): Normal ad libitum smoking prior to the session.

Smoked one cigarette upon arrival at the lab.

Picture Viewing Task

At both laboratory sessions participants viewed 2 blocks of 27 different pictures. Pictures were displayed for 6s and separated by an unpleasant IAPS and smoking pictures were selected from independent pretesting with smokers to account for individual differences in startle response. CO Level (ppm) was included as a covariate in analyses of experimental session data in order to moderate the effect of nicotine deprivation on startle response.

Results of the picture viewing task and follow up testing separately compared subject variables, respectively. Picture type was also included as an interactive within (centered) and task time (1 minute exposure periods in the middle and end of each laboratory session.

RESULTS

Experimental Session

Nicotine deprivation does not alter startle response to unpleasant or smoking pictures

Screening Session

- Startle response during cigarette exposure was not affected by cigarette availability or smoking group.
- During the picture viewing task there was a main effect of picture type F(2,7) = 6.17, p = .003, but no main effect of nicotine deprivation group, p = .55, nor an interaction with smoking group, p = .94.

picture type showed a significant main effect, t(37) = 3.51, p = .001.

Nicotine deprivation group showed no main effect, t(37) = 0.49, p = .62, interaction with picture type, t(37) = 0.79, p = .43, or interaction with smoking vs. neutral picture contrast, t(37) = 0.50, p = .62.

Nicotine deprivation moderates the effect of cigarette availability on the startle response during cigarette exposure, t(37) = 3.51, p = .001.

Nicotine deprived smokers display elevated startle during cigarette exposure when they can not smoke the cigarette, t(37) = 5.63, p < .001.

CONCLUSIONS

- Exposure to lit cigarettes increases negative affective responses as measured by the startle response among nicotine-deprived smokers selectively when the cigarettes are unable to be smoked.
- Nicotine deprivation does not alter the startle response to pictures related to smoking cigarettes, replicating null effects from previous studies.
- Nicotine deprivation does not alter the startle response to unpleasant IAPS pictures, replicating null effects from previous studies.
- The motivational properties of distinct classes of drug cues (pictures vs. actual drug exposure) should be carefully considered in selecting relevant stimuli in experimental research and have important implications for the ability to detect theoretically meaningful effects of drug deprivation and availability.

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