Does craving intensity influence cue exposure reports?

F. Serre[1],

M. Fatseas[1],

J. Swendsen[2],

M. Auriacombe[1]

An Ecological Momentary Assessment Study in Patients with Alcohol, Tobacco, Cannabis and Heroin use disorder

[1] Addiction Psychiatry Research - CNRS USR 3413, Univ. Bordeaux, Bordeaux, France

[2] CNRS UMR 5287 - INCIA , Univ. Bordeaux, Bordeaux, France

Conflicts of interest: None

INTRODUCTION (1)

➤**Cues reactivity**

Craving increases as a function of contact with stimuli or "cues" commonly associated with substance use

- In laboratory settings (Carter and Tiffany, 1999)

- In daily life (Fatséas et al., 2015; Serre et al.,2015)

➤**Is opposite true ? How does craving influence later cue reports ?**

Are individuals more likely to notice cues when they have higher levels of craving ?

OBJECTIVES

➤**To assess the influence of craving intensity on subsequent cue reports in daily life using EMA**

METHODS - Participants

➤Current dependence (DSM-IV) for
- Alcohol
- Tobacco
- Cannabis
- or Opiates

➤Recruited through an outpatient addiction treatment center

➤Enrolled at treatment initiation

METHODS - EMA

➤**Material**
- Ecological Momentary Assessment (e.g., Smartphones or PDAs) to provide mobile assessment in daily life

➤**Procedure**
- 4 assessments / day (approximately every 4 hours)
- 14-day EMA period
- Signal schedules randomized across participants
- Additional urine drug screen and alcohol breath test
- Financial compensation

METHODS - Ambulatory measures

➤ **Craving intensity**
  - At each assessment
  - Seven-point scale

➤ **Number of cues reported, including**
  - *Substance-specific cues:* objects or paraphernalia typically used by all individuals to use the substance

  - *Person-specific cues*: the unique objects, circumstances or contexts associated with substance use for that given person (derived from individual interview)

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METHODS – Procedure

- Upon enrollment in treatment, all eligible patients were proposed participation in the study

- Individuals who accepted received a 30-min training session

- Ambulatory assessment started after a target quit date
  - Within a two-week period

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METHODS - Statistical analysis

➤ **Examine the influence of craving on later reports of cues**
  - **Prospective**
    - ✓Within-day time-lagged analyses
    - ✓Craving intensity at T0 predicts number of cues reported at T1 (4 hours later).

➤ **Tests:**
  - ✓HLM (hierarchical linear and nonlinear modeling)
  - ✓Multilevel linear models for continuous outcomes (craving intensity)
  - ✓Controlled for age and sex
  - ✓Controlled for substance use

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RESULTS - Sample characteristics

➤ **132 participants included**
  - 39 for Alcohol; 32 for Opiates; 32 for Tobacco; 29 for Cannabis
➤ **Socio-demographic characteristics**
  - Age: mean 36.4 years (SD=10.8)
  - Gender: 31.8% female
  - Employed: 62.5%
  - Married, with family or cohabiting: 70.1%
➤ **Craving**
  - Intensity : mean 3.4 (SD=2.1)
➤ **Number of cues**
  - Substance-specific cues: mean 2.5 (SD=2.3)
  - Person-specific cues: mean 1.8 (SD=1.5)

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RESULTS –Craving predicting later reports of cues (1)

Predictor	Outcome	γ Coef	SE	df	T-ratio	p
Craving T0	Substance-specific Cues *T1*	0.106	0.048	129	2.196	0.030
Craving T0	Person-specific Cues *T1*	0.104	0.029	129	3.481	0.001

Adjusted for age and sex

➢ **Craving intensity at T0 strongly predicted** number of cues reported at T1

RESULTS –Craving predicting later reports of cues (2)

➢ Craving intensity also predicted later substance use
➢ Substance use was associated with same-time number of cues reported (Fatseas et al, 2015; 110 (6): 1035–1042)

We ran an additional model controlling for substance use at T1

Predictor	Outcome	γ Coef	SE	df	T-ratio	p
Craving T0	Substance-specific Cues *T1*	0.033	0.040	128	0.837	0.404
Craving T0	Person-specific Cues *T1*	0.072	0.024	128	2.974	**0.004**

Adjusted for age, sex, substance use at T1

➢ **Craving intensity remained a good predictor of the number of person-specific cues reported later**

DISCUSSION / CONCLUSION

➢ Patients who are experiencing higher levels of **craving** were **more likely** to **report higher number of cues** at the next assessment
➢ Even after controlling on substance use at T1

➢ **Hypothesis**
  - Craving increases the consciousness of cues
  - Individuals who are experiencing higher levels of craving are more likely to notice cues
➢ Further studies are needed to explore this hypothesis

CONTACT

Fuschia Serre, PhD

fuschia.serre@u-bordeaux.fr

Melina Fatseas, MD, PhD

melina.fatseas@u-bordeaux.fr

Marc Auriacombe, MD

marc.auriacombe@u-bordeaux.fr

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ABSTRACT

Aim: Although it is now well established that exposure to substance-related cues could induce craving, less studies have examined if individuals experiencing higher levels of craving are more likely to report exposure to cues. Here, we aimed to examine the influence of craving intensity in the prediction of cue exposure reported in daily life.

Method: A total of 132 participants were recruited from an outpatient addiction clinic and completed 2 weeks of computerized ambulatory monitoring of daily life experiences using Ecological Momentary Assessment (EMA). The main substance of dependence was alcohol (n=39), opiates (n=32), tobacco (n=32), or cannabis (n=29). Patients described in real-time craving intensity and exposure to cues. Data were analyzed using hierarchical linear models (HLM) to examine the influence of craving intensity (T0) on later reports of cues (T1: 4 hours later).

Results: Craving intensity at T0 strongly predicted number of cues ($\gamma = 0.104$, $p<0.001$) reported at T1. As craving intensity also predicted later substance use and as substance use was associated with same time cue reports, we ran an additional model controlling for substance use at T1. Craving intensity remained a good predictor of later reports of cues ($\gamma = 0.072$, $p<0.01$).

Conclusion: In this study individuals who are experiencing higher levels of craving were more likely to report exposure to cues at the next assessment, even after controlling on substance use at T1. We hypothesize that craving increases the consciousness of cues and that individuals who are experiencing higher levels of craving are more likely to notice cues. Further studies are needed to explore this hypothesis.