Craving and its dynamics as predictors of stimulants use: an Ecological Momentary Assessment study

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INTRODUCTION

Craving is defined as an irrepressible and unvoluntary desire to use the substance /addictive behavior *(Auriacombe et al., 2018)*. Craving is a major predictor of relapse, common to all addictions, and thus considered as a **prime target for addiction treatment**.

Ecological Momentary Assessment (EMA) studies previously demonstrated a prospective association between increase in **craving** intensity, and higher probability of **substance use** in the following hours for alcohol, tobacco, cannabis and opiates *(Fatseas et al., 2015)*. To date, only few studies have explored this link for **stimulants.**

Craving is a **dynamic state**, which may vary in intensity and frequency from day to day in the same individual *(Enkema et al., 2020).* Based on the literature on affect dynamics, recent methods make it possible to explore **characteristics of dynamic variability of craving over time**, and their influence in subsequent substance use.

OBJECTIVE

Explore the influence of craving intensity and its dynamics in daily life on stimulants use in the following hours or the day after, among participants with Stimulants Use Disorder.

METHODS

Data were extracted from two EMA studies (see Serre et al., 2012, 2018)
Population
• Patients initiating addiction treatment in outpatient clinics in France & Users from Harm Reduction Settings
• Stimulants Use Disorder (DSM-5 criteria)

EMA protocol

Inclusion / or Treatment intake — Day 1 — CRAVING / USE — EMA — Day 14

ASI MINI

ASI: Addiction Severity Index (Denis, et al. 2016)
MINI: Mini International Neuropsychiatric Interview (Sheehan, et al. 1998)
EMA: (see Serre et al. 2012; 2018)

• 4 / day
• Random
• Beep call
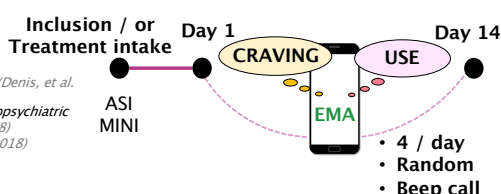
Statistical Analyses
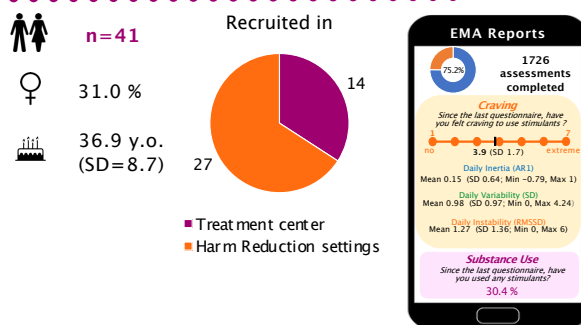
Within day craving dynamics, based on craving intensity

• *Inertia:* daily within-person autocorrelation (AR1)
 -> tendency to persist from one moment to the other

• *Variability:* daily within-person standard deviation (SD)
 -> the overall amplitude of changes

• *Instability:* daily root mean squared successive difference (RMSSD)
 -> magnitude of changes from one moment to the next

Generalized and Linear mixed models (fit by maximum likelihood)

Test at the within-person level

• Influence of craving intensity at a given time (T0) on probability of stimulants use at the next assessment (T1, approximately four hours later)

• Influence of craving intensity dynamics one day (D0) on probability of stimulants use the same day (D0, cross-sectionally) and the day after (D1, prospectively), controlling for mean craving intensity of the day

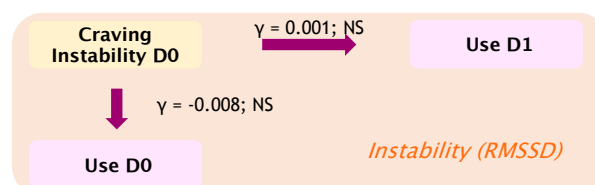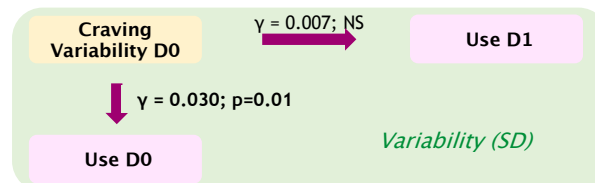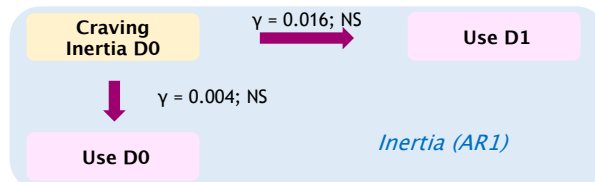• Prospective time-lagged analyses controlled for stimulants use at T0/D0

RESULTS

n=41

♀ 31.0 %

36.9 y.o. (SD=8.7)

Recruited in

14
27

■ Treatment center
■ Harm Reduction settings

EMA Reports
1726 assessments completed
75.2%

Craving
Since the last questionnaire, have you felt craving to use stimulants ?
1 no — 3.9 (SD 1.7) — 7 extreme
Daily Inertia (AR1)
Mean 0.15 (SD 0.64; Min -0.79, Max 1)
Daily Variability (SD)
Mean 0.98 (SD 0.97; Min 0, Max 4.24)
Daily Instability (RMSSD)
Mean 1.27 (SD 1.36; Min 0, Max 6)

Substance Use
Since the last questionnaire, have you used any stimulants?
30.4 %

• At the assessment level

Craving T0 → $\gamma = 0.194$; p=0.0002 → **Use T1**

• At the daily level

Craving Inertia D0 → $\gamma = 0.016$; NS → **Use D1**
↓ $\gamma = 0.004$; NS
Use D0
Inertia (AR1)

Craving Variability D0 → $\gamma = 0.007$; NS → **Use D1**
↓ $\gamma = 0.030$; p=0.01
Use D0
Variability (SD)

Craving Instability D0 → $\gamma = 0.001$; NS → **Use D1**
↓ $\gamma = -0.008$; NS
Use D0
Instability (RMSSD)

DISCUSSION

An increase in craving intensity at a given time is associated with a greater risk of stimulants use at the next assessment
➔ Confirmed the major role of craving in substance use *(Serre et al., 2018)*

Stimulants use was higher on days when craving variability was high, while controlling for mean craving
• Craving variability has previously been associated with the proportion of use days in Opiate Use Disorder *(Ellis et al., 2022)*
➔ Treatment could target better regulation of craving intensity to avoid large fluctuations

No influence of craving dynamics on stimulants use the following day
➔ Influence may only last a few hours, and no longer be visible the next day

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