Characterizing Childhood Trauma and Behavioral Economic Demand for Opioids in an Online Sample

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Background & Aims

- Individuals who have experienced **childhood trauma** (e.g., previous family history of drug use or sexual abuse) are more likely to develop **substance use disorders** (NIDA, 2019; Rhee et al., 2019).
- Relations with childhood trauma and drug reinforcement have rarely been investigated outside of self-report.
- **Behavioral Economics (BE)** is a useful tool for understanding drug reinforcement (Reed et al., 2016; Johnson & Bickel, 2006) and may have implications for treatment (Strickland et al., 2019).

Study Aim: To understand potential relations between adverse childhood traumas and behavioral economic indices of drug demand (e.g., rate of change in elasticity and intensity).

Methods

- 35-minute online study conducted on Amazon MTurk.
- Participants
  - Adults ages 18-90 with a 12-month history of using opioids (N = 50), read, write, and understand English, in the U.S., and ≥ 95% approval rating.
- Measures
  - **Behavioral Economic Purchase Task** – 17 prices ($0 - $20)
    - e.g., "How many pills of your typical opioid would you purchase and consume in the hypothetical 24-hour period at the price of $4 (i.e., $4 per pill)?"
  - **DSM – V Diagnosis for Opioid Use Disorder (OUD)** – 11 items
    - e.g., "Have you had a strong desire or urge to use opioids?"
  - **Experience Pain** – 1 item
    - "Do you suffer from chronic pain and/or any kind of pain?"
  - **Adverse Childhood Experience (ACE) Questionnaire** – 14 items
    - *Drug family history* – "Did you live with anyone who was a problem drinker or alcoholic or who used street drugs?"
    - *Sexual abuse history* – "Did an adult or a person at least 5 years older than you ever touch or fondle you or have your body touched in a sexual way?"
- Data Analysis
  - Removed nonsystematic data (Stein et al., 2015), n = 16.
  - Exponentiated demand equation (Koffarnus et al., 2015); k = 2.36.
  - Mann-Whitney U tests to examine group differences.

Results

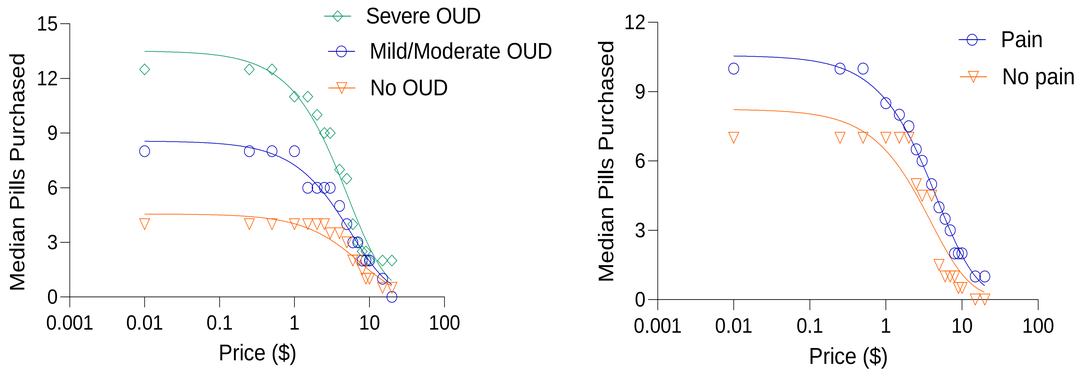

Figure 1. Simulated purchasing by OUD status (left panel; n = 16 Severe; n = 27 Mild/Moderate; n = 6 No) and experiencing a pain condition (right panel; n = 38 Pain; n = 12 No Pain). Lines represent the nonlinear regression fit of the exponentiated demand equation (Koffarnus et al.) to the median data points. R^2 range .70 - .98. OUD = opioid use disorder; Pain = chronic pain and/or any kind of pain.

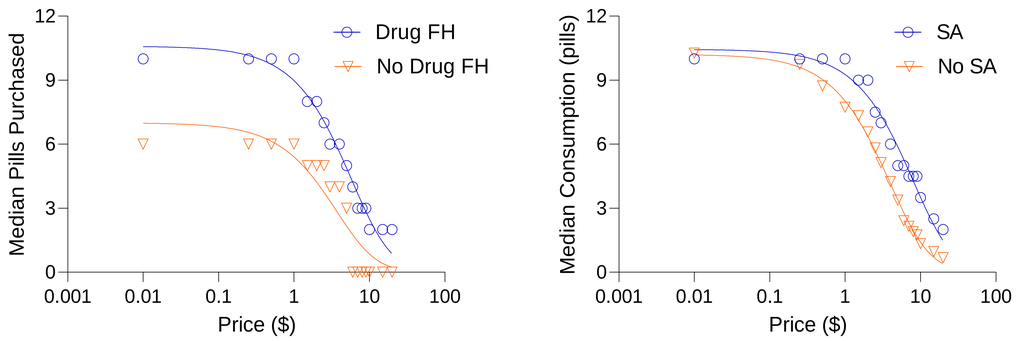

Figure 2. Simulated purchasing by family history of drug use (left panel; n = 25 Drug FH, n = 25 Drug FH) and sexual abuse history (right panel; n = 18 SA; n = 32 No SA). Lines represent the nonlinear regression fit of the exponentiated demand equation (Koffarnus et al.) to the median data points. R^2 range .88 - 100. Drug FH = family history of drug use; SA = sexual abuse history.

Table 1. Sample Characteristics

Age *[M (SD), range]*	38 (9.2), 21-64
Gender [n, (%)]	
Female	22 (44)
Male	26 (52)
Non-binary	2 (4)
Experience pain	38 (76)
Opioid use disorder	43 (86)
ACEs *[M (SD), range]*	5 (3.6), 0-13
Experienced a drug overdose in their lifetime	16 (32)

Results

Table 2. Opioid demand parameters (median)

	Intensity (Q_0)	p	Elasticity (α)	p
Severe OUD	14.45	✚	0.00282	
Mild & Moderate OUD	9.05	✚	0.00334	
No OUD	4.36		0.00553	
Experience daily pain	10.27		0.00319	
Do not experience daily pain	8.15		0.00462	
Previous family history of drug use	10.68		0.00304	*
No previous family history of drug use	6.63		0.00407	
Sexual abuse history	10.72		0.00184	**
No sexual abuse history	9.38		0.00394	

Mann-Whitney U tests were conducted to compare groups. Note: **p < .01; *p < .05. Statistical comparisons were made between Severe and Mild OUD to No OUD. ✚p < .05.

Discussion

- Data collection is ongoing. These preliminary analyses suggest additional comprehensive analyses are warranted with a larger sample.
- These data add to the childhood trauma literature, quantifying the influence of adverse childhood experiences on demand for opioids.
- These data support the potential of demand as a clinically useful measure of drug valuation that is sensitive to individual difference variables.
- Demand curves offer multi-dimensional valuation of drug reinforcement, with differences in utility of various demand metrics (e.g., intensity vs elasticity) depending on previous experiences/histories.
- Elasticity is sensitive to family drug history and sexual abuse.
- Trending sensitivity of intensity across pain and family drug history.
- Divergent sensitivity of intensity across family drug history and sexual abuse.
- Replicated Strickland et al. (2019) findings when comparing demand for opioids among people with no OUD to those with OUD.
- Limitations: small sample size, crowdsourcing platform, lack of diversity, and self-reported opioid use.

For references or questions please contact: avasquezferreiro@ufl.edu