



Author Spotlight – Dr. Anna Konova

Here we had the chance to learn from Dr. Anna Konova about her work recently published in [Biological Psychiatry](#). Dr. Konova is an Assistant Professor at Rutgers University and Director of the Addiction & Decision Neuroscience Lab. Her laboratory recently found that recent opioid use was linked with lower sensitivity to reward context in a decision task, using competing computational models.

How did you first start thinking about this research question? What was the spark?

Our work aims to understand addiction's cycling pattern in the hope of generating improved intervention targets. In this study, we wondered what happens to a person's decision-making process following opioid use that puts them at risk for continued use. We hypothesized that over-selection of drug-related actions following recent use could be explained by an alteration in range adaptation, a canonical process in decision systems of fine-tuning representations of value based on the range of available reward in the local context. Recent drug use could effectively widen the perceived reward range, or it could interfere directly with this dynamic adaptation process, leading to difficulties deciding about smaller (typically nondrug) rewards in the aftermath of drug exposure.

Tell us about your work in this paper - what was your study design?

To test if range adaptation differs by recent use, we recruited individuals with opioid use disorder who, despite being treatment engaged, had consumed opioids either recently (within the past 90 days, and typically within a few days) or in the more distant past (at least 90 days ago or more). 90 days was chosen as a clinically relevant timeframe associated with early remission. We also studied a cohort of healthy comparison participants. The three groups completed a reinforcement learning task designed to induce robust contextual modulation of value. We applied two computational models to assess the latent process that participants engaged while making their decisions and compared their fits to the data in each group: 1) a Range model that dynamically tracks context and 2) a standard Absolute model that assumes stationary, objective encoding of value.

What was the central finding? Why was this important?

We found that control participants and those abstinent from opioids for at least 90 days exhibited choice patterns consistent with range-adapted valuation. In contrast, participants with recent opioid use were more prone to learn and encode value on an absolute scale. This reduced tendency to range adapt in the recent use group could signal difficulty in flexibly fine-tuning representations of a current reward's value to better place it within the range of available outcomes in favor of a less efficient, absolute value encoding strategy, and this shift was more pronounced the less time had elapsed since opioid

exposure and with increased subjective craving and withdrawal. A reduced tendency to range adapt would make it harder to distinguish among smaller rewards, leading to their suboptimal choice and/or apathy across multiple social and personal domains. Moreover, differences between high-value drug options and lower-value alternatives would be amplified, collectively promoting drug seeking in high-vulnerability states. We think these findings reveal a novel neuro-computational mechanism for vulnerable states that perpetuate the addiction cycle.

Is there a little nugget buried in the results section that most readers might not notice?

In extensive sensitivity analyses, we were surprised to find that the relationship between participants' tendency to range-adapt during reinforcement learning was so specific to opioid abstinence. We did not, for example, find much of an effect of income or depression, which we thought could reasonably interact with this value-based process. This raises interesting questions about neural mechanism and how this decision process is shaped by real-world reward environments, questions we hope to pursue in the future.

What's next for your research?

We would like to better understand the abstinence duration that is necessary for recovery of this key process (range adaptation). To do so, we plan on conducting follow up longitudinal studies that will allow us to track how value encoding changes over time within-person. We would also like to better understand the implications for real-world decisions and contexts beyond the artificial lab setting. For this, we are conducting experience sampling studies to capture the distribution of rewards people encounter in their natural environments. Lastly, we are testing the neural instantiation of range adaptation using fMRI and asking how regions like the orbitofrontal cortex flexibly represent reward and how this might differ in opioid use disorder to better understand the mechanistic source of our behavioral findings.

What do you most enjoy about the SOBP meeting?

What I always look forward to at this meeting, and what I think it consistently delivers, is the truly interdisciplinary program. As someone who works at the intersection of two fields (clinical and cognitive neuroscience), I really appreciate that SOBP always delivers a high-caliber program that matches the level you might see at more specialized meetings in each of these fields, but additionally fully engages with the intersecting part, which is really rare and unmatched in my experience by other meetings.

Read the full details of her work here:

[https://www.biologicalpsychiatryjournal.com/article/S0006-3223\(23\)01762-6/fulltext](https://www.biologicalpsychiatryjournal.com/article/S0006-3223(23)01762-6/fulltext)