

UNDERSTANDING NEW PSYCHOACTIVE SUBSTANCES: ANLP APPROACH

WALTER TYRNA | METIS



OVERVIEW

- Define New Psychoactive Substances (NPS) and problem
- Review data selection and methodology
- Perform exploratory data analysis
- Analyze model results
- Future work

DEFINING THE PROBLEM

What are NPS?

UNODC uses the term “new psychoactive substances (NPS)” which are defined as “substances of abuse, either in a pure form or a preparation, that are not controlled (...) but which may pose a public health threat

- United Nations Office on Drugs and Crime (UNODC)

Can we better understand the NPS threat using a data science approach to inform policymakers?

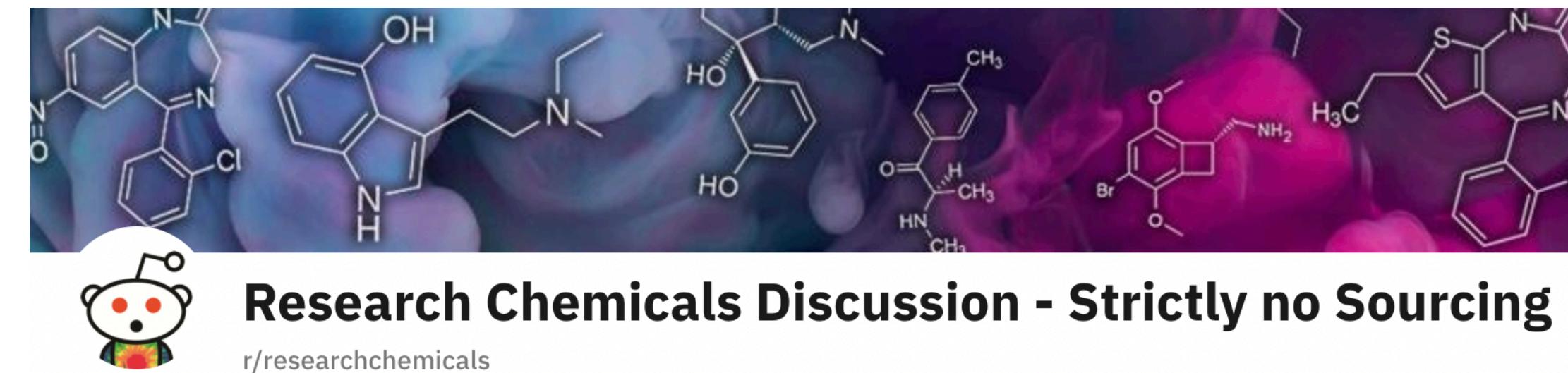
Which drugs are prone to more harmful reactions?



DATA & METHODOLOGY

Data:

- “Research Chemicals” subreddit, top weekly posts from Sept 2020 - Nov 2021
- 1031 posts with at least 100 words each



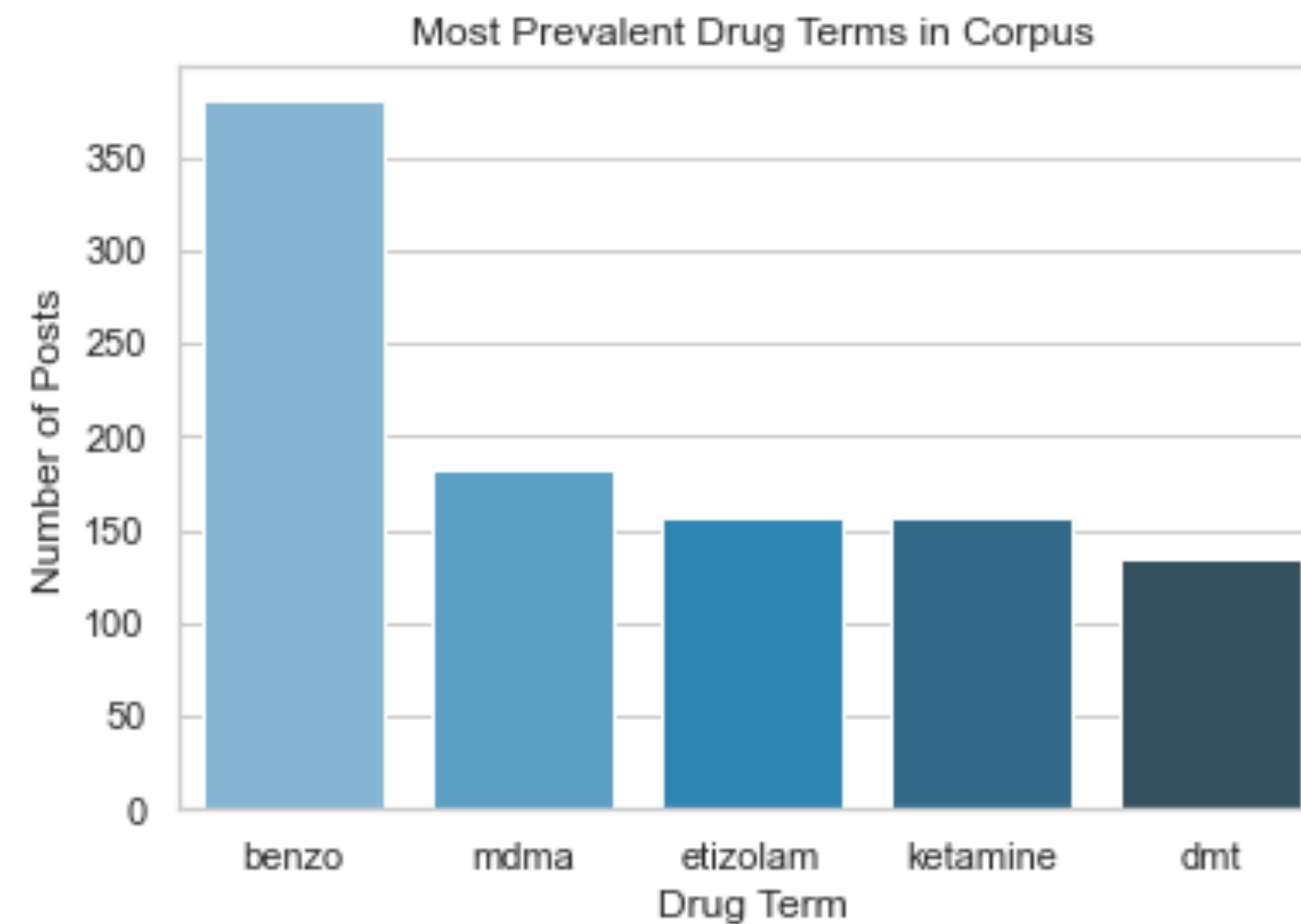
Approach:

- Isolate common drugs mentioned in subreddit
- Use Latent Dirichlet Allocation to determine general topics from postings
- Determine which drugs align with each topic

INITIAL EDA

What are redditors talking about?

- Over 200 drugs identified, several different drug categories

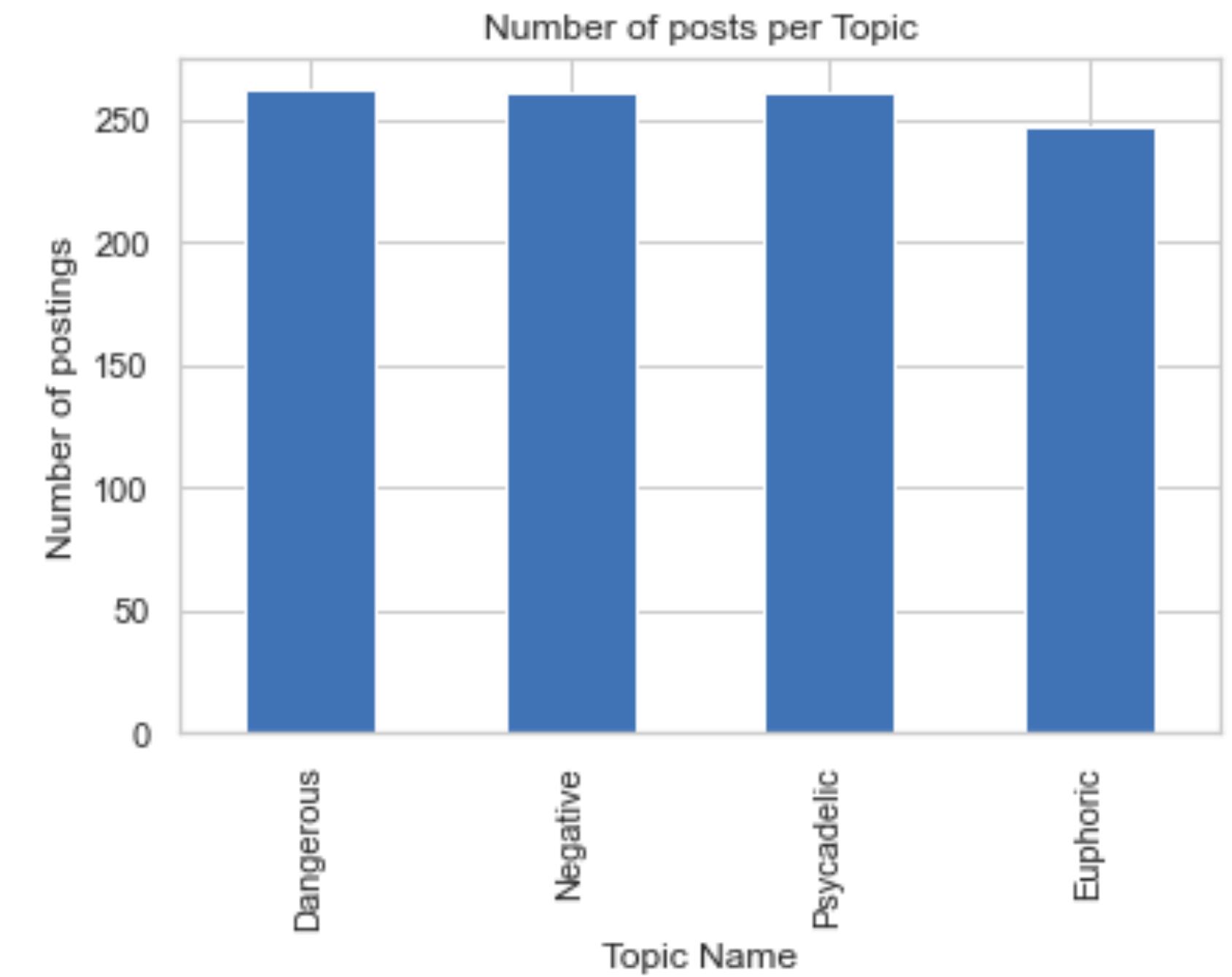


| Category | In table | General Use |
|---------------------------|-----------------|--------------|
| Benzodiazepine | Benzo, Etizolam | Anti-anxiety |
| Ampetamine Type Stimulant | MDMA | Stimulant |
| Anesthetic | Ketamine | Sedation |
| Hallucinogenic | DMT | Psychedelic |

MODEL RESULTS

Four general topics:

| Dangerous Experience | Negative Experience | Psychedelic Experience | Euphoric Experience |
|----------------------|---------------------|------------------------|---------------------|
| blackout | anxiety | sensory | energy |
| seizure | withdraw | fractal | intense |
| hospital | anxious | texture | euphoria |



[Link to interactive LDA chart](#)

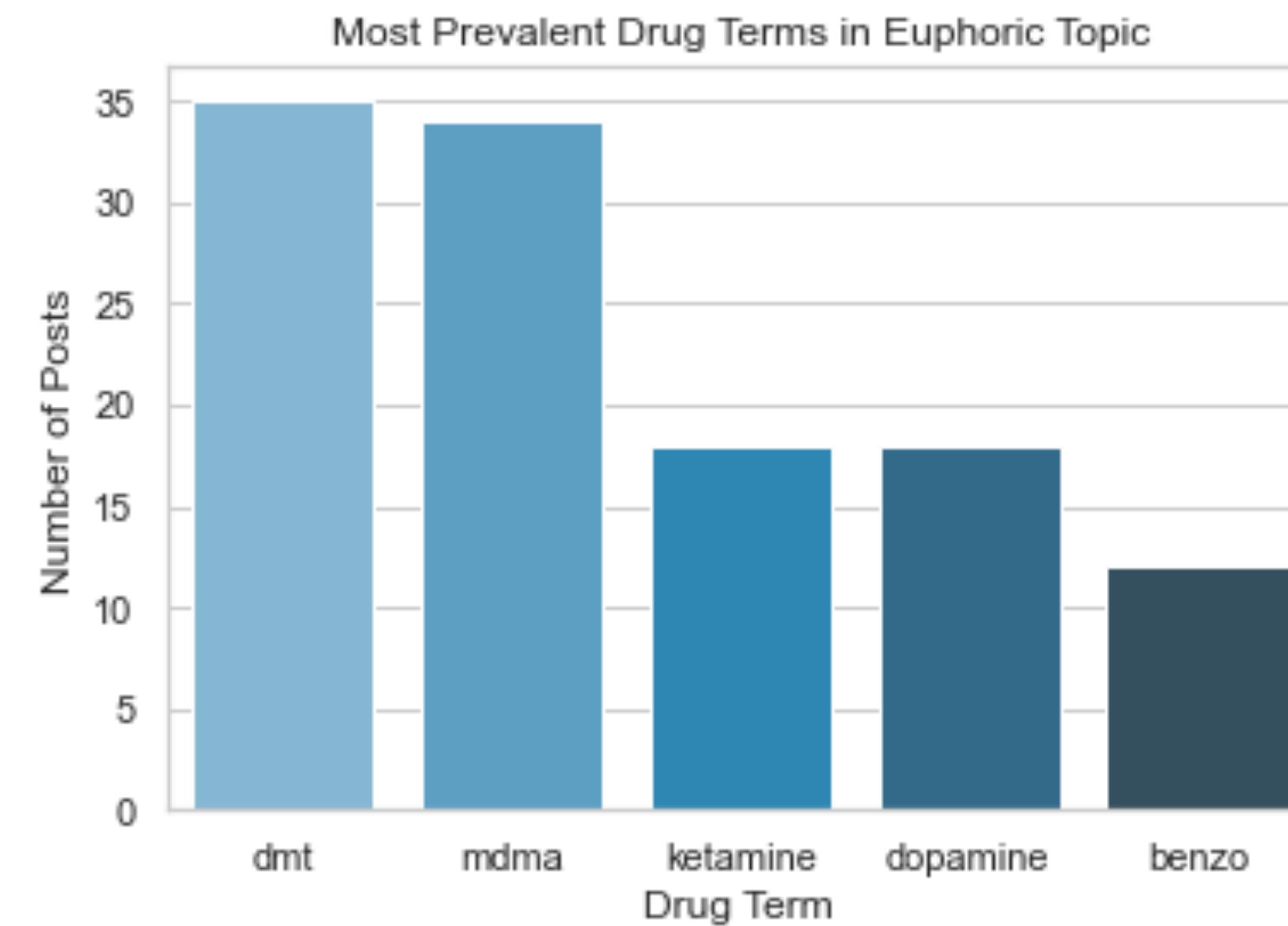
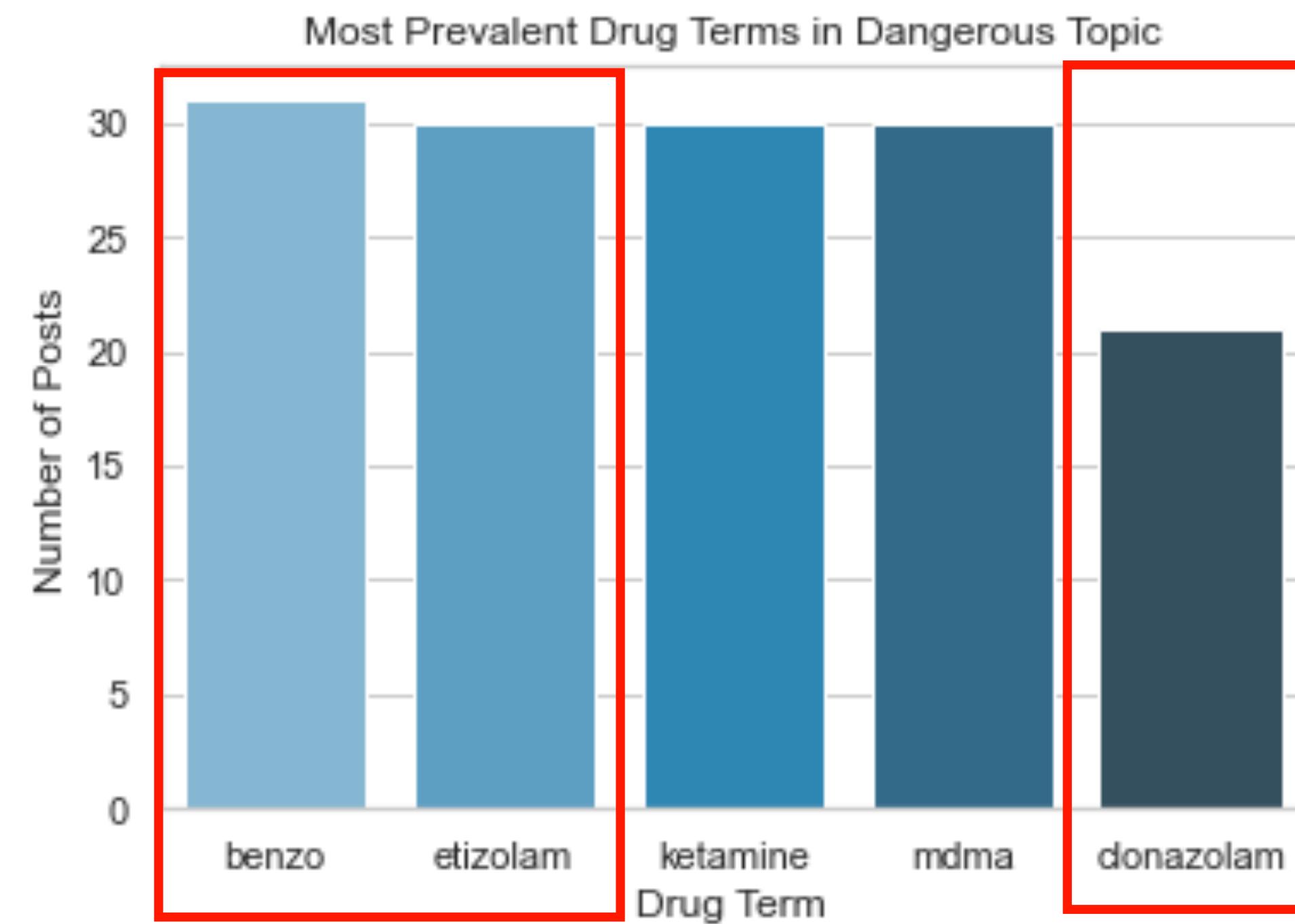
MODEL RESULTS

REDDIT POST - DANGEROUS EXPERIENCE SCORE: 0.985764

i loved bromazolam so i hate to say it but it is not safe actually it s the most dangerous benzo i ve ever used i ve been on off benzos for years i ve only had grand mal **seizures** from the many benzo **withdrawals** i ve gone through including this one if your not **addicted** to benzos and use occasionally maybe it s ok but it did not take long for my friend to get one too maybe weeks but i didn t even think he had enough to last that long if it wasn t for that i wouldn t even share because i probably would have had one regardless of what benzo i used last because of long term daily use it was very bad though i am lucky to be alive i had **blacked out** for hours and apparently thought i was someone else and was acting like i was demon possessed(...)

MODEL RESULTS

NPS associated with dangerous reactions versus euphoric

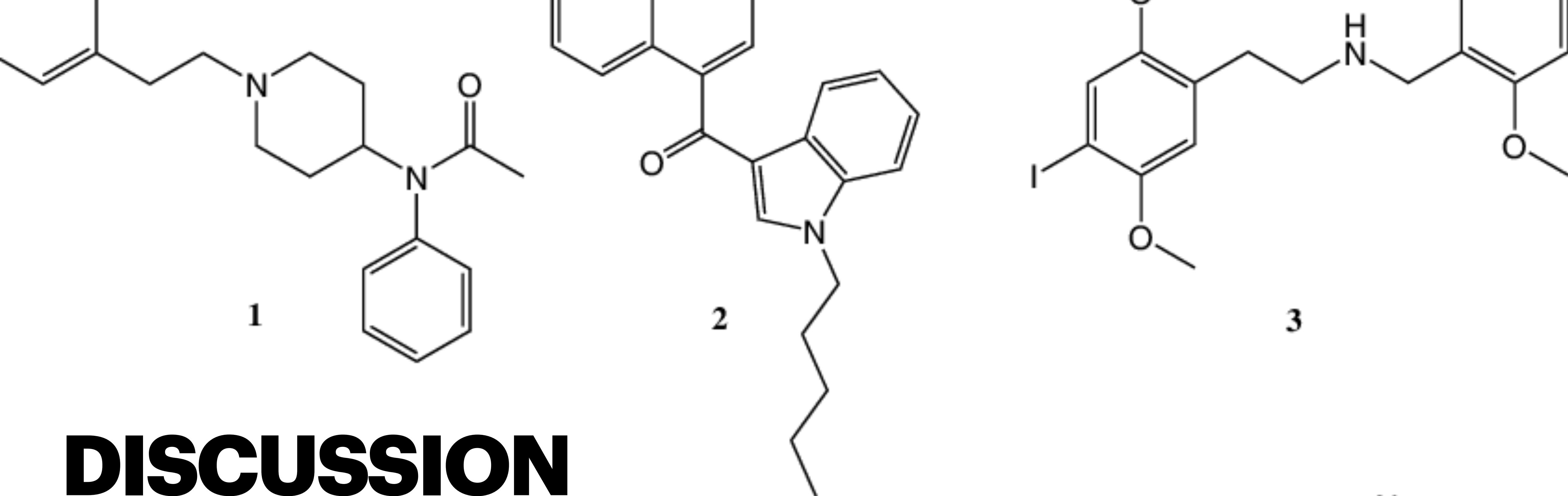


Benzodiazepine type NPS are most prevalent in posts related to dangerous experiences.

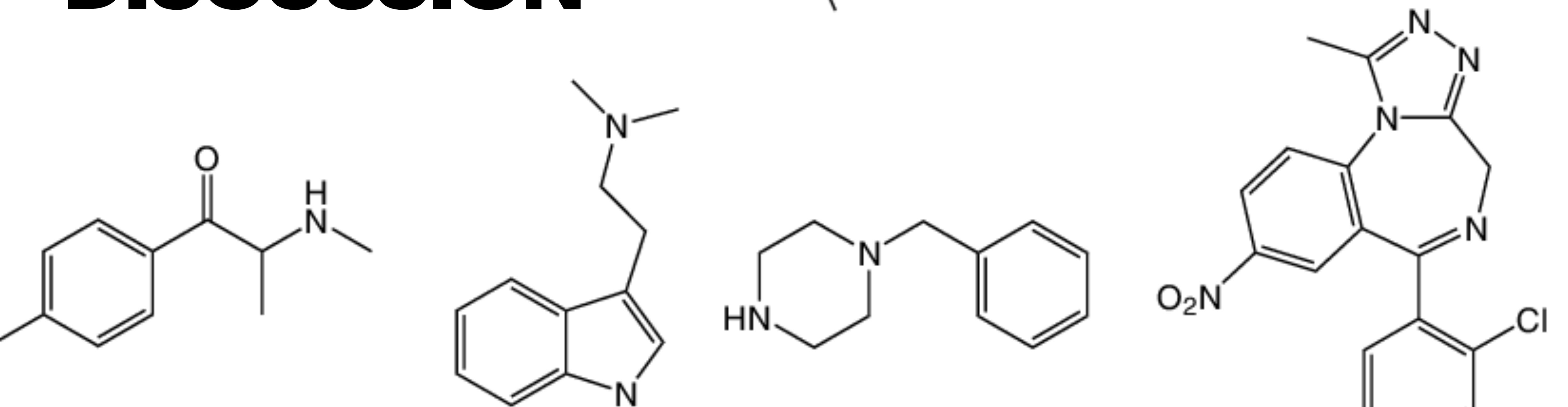
FUTURE WORK

- Create more robust drug corpus & general drug type categories
- Include more structured datasets





DISCUSSION



APPENDIX

- The four topics are generally well separated

