MDMA Self-Administration in the Presence of a Social Partner

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Introduction

3,4 Methylenedioxymethamphetamine (MDMA) is used and misused in humans. Users self-report use in social settings where the prosocial empathetic effect of the drugs is noted as a driver of use.

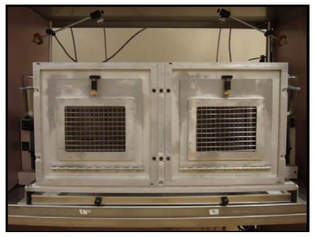
In animal models, MDMA functions, at best, as a weak positive reinforcer with low levels of self-administration. Frequently, subjects must be trained on other drugs (e.g. cocaine) prior to MDMA self-administration. However, MDMA self-administration sessions occur in chambers in which the subject administers alone.

The purpose of the present study was:
1) To determine whether social context influences the positive reinforcing effects of MDMA.
2) To determine whether social context influences the prosocial effects of MDMA.

Methods

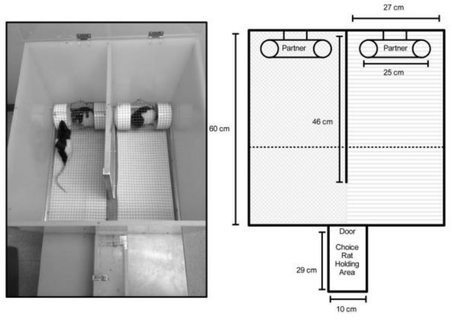
Testing and Housing Conditions:

-Isolated Females
-Females Partnered with Females
-Females Partnered with Males
-Isolated Males
-Males Partnered with Males
-Males Partnered with Females



Intravenous Self-Administration:
4-Hour Sessions
Cocaine Training with 0.5 mg/kg/inf Cocaine on FR1
MDMA Training with 0.5 mg/kg/inf MDMA on FR1
MDMA FR Testing across doses (.03-1.0 mg/kg/inf)
MDMA Progressive Ratio Testing across doses (.03-1.0 mg/kg/inf)
For test sessions, a single day/dose was tested. Dose order was randomized.

Partner Preference:
15 min test sessions
3 zones:
- Proximity to A
- Proximity to B
- Alone



Rats partnered during administration were tested for preference for familiar vs unfamiliar.

Isolated rats were tested to determine whether acute administration of MDMA (5 mg/kg, IP) induced preference for MDMA-treated unfamiliar vs saline-treated unfamiliar rats.

Results

MDMA Fails to Serve as a Positive Reinforcer in All Conditions Tested

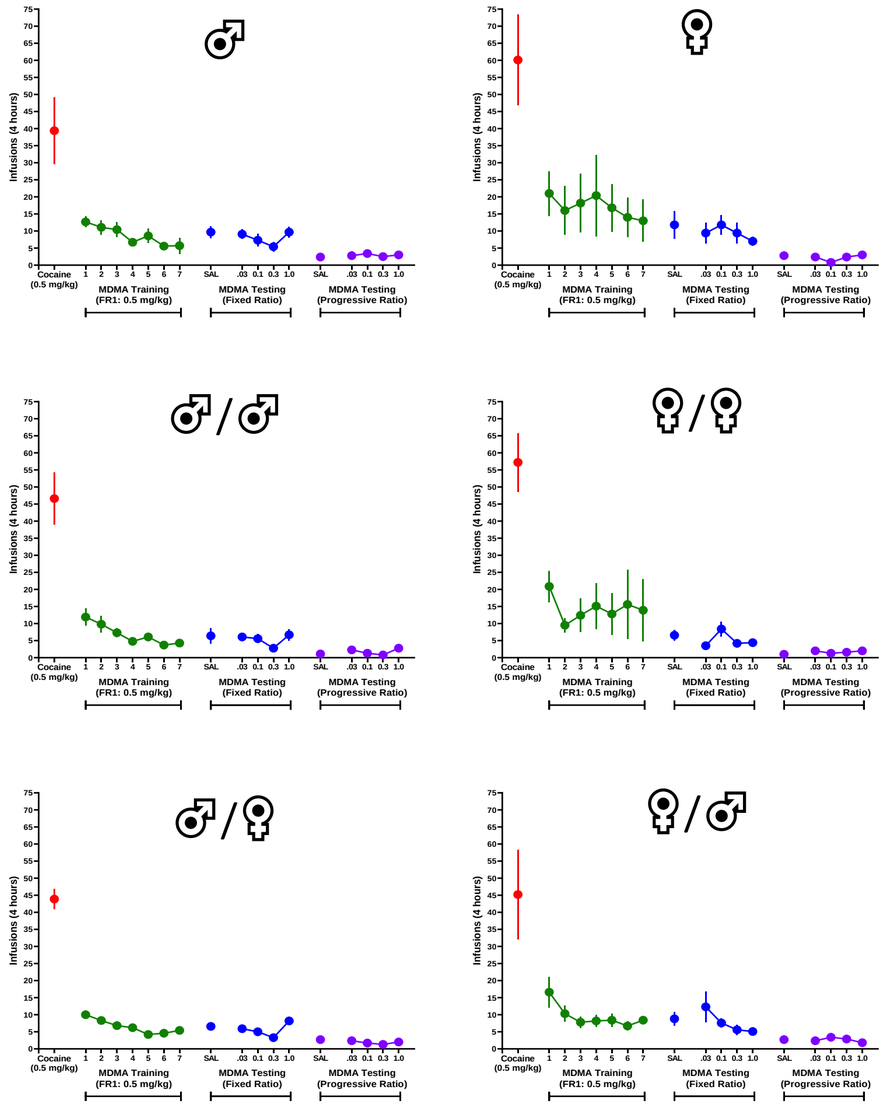


Fig. 1. In male (left column) and female (right column) rats, MDMA intake is not higher than saline regardless of whether testing occurred in isolation (top row), same-sex partners (middle row), or opposite-sex partners (bottom row). Isolated male (♂) n = 9; Male partnered with male (♂/♂) n = 12; Male partnered with female (♂/♀) n = 9; Isolated female (♀) n = 5; Female partnered with female (♀/ ♀) n = 14; Female partnered with male (♀/♂) n = 9. Data points indicate mean ± SEM.

Conclusions

Social conditions do not enhance the positive reinforcing effects of MDMA in rats. A shared history of MDMA self-administration does not induce a partner preference either. Acute MDMA treatment induces a preference for alone space.

Perhaps the observed lack of prosocial effects following shared histories of MDMA and acute administration of MDMA contributes to the low reinforcer efficacy of MDMA in animal models.

Q&A @ my APA "Office Hours" Friday Aug. 13th from 3:00-3:30pm.

A Shared History of MDMA Use Fails to Induce a Partner Preference

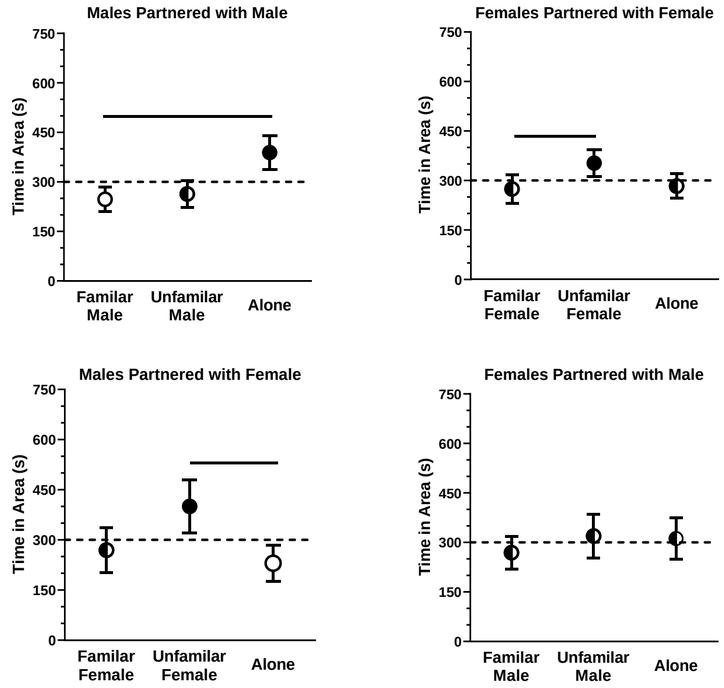


Fig. 2. In males (left column) and females (right column) rats, partner preferences were not observed. Data bars indicate mean ± SEM; ----- indicate significant differences between times in zones; filled symbols indicate significantly above chance; empty symbols indicate significantly below chance; half-filled symbols indicate no preference.

Rats Acutely Administered MDMA Do Not Prefer MDMA-Treated Partners

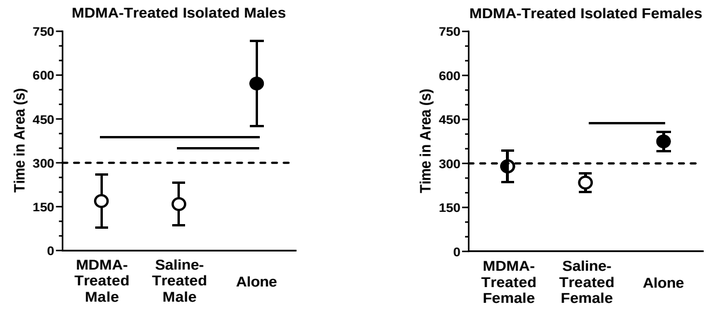


Fig. 3. In female (left column) and male (right column) rats treated with 5mg/kg MDMA spend significantly more time in the alone zone. Data bars indicate mean ± SEM; ---- indicate significant differences between times in zones; filled symbols indicate significantly above chance; empty symbols indicate significantly below chance; half-filled symbols indicate no preference.

Acknowledgements

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