

Delay discounting of pregnancy- and condom-protected sex among methadone-maintained women

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Introduction

- Over 80% of pregnancies are unintended among women with opioid use disorder (OUD; Heil et al., 2011).
- Use of effective contraception is uncommon in this population (Terplan et al., 2015).
- Initiating and using effective contraception involves delays:
 - to obtain the method from a provider,
 - to become protected after initiating use.
- Interventions that include delay reductions among other elements have increased contraceptive use (Heil et al., 2016; Secura et al., 2014).
- Women with OUD have reported greater likelihood of engaging in unprotected sex at shorter delays to acquiring protection from sexually-transmitted infection (STI) than women without OUD (Herrmann et al., 2014).
- There is no current method for assessing how delays to pregnancy protection affect sexual decision-making.
- The present study was designed to evaluate a novel tool for measuring how delays to pregnancy protection affect self-reported likelihood to engage in protected vs. unprotected sexual intercourse.

Method

- Participants were 13 women who were:
 - 18-44 years old
 - Heterosexual or bisexual
 - Able to become pregnant (e.g., no history of tubal ligation/hysterectomy)
 - Maintained on methadone by Family Center at Thomas Jefferson University.
- Participants provided demographics and completed a reproductive history interview, Condom Discounting Task (CDT), and the novel Pregnancy Discounting Task (PDT).
- For the CDT and PDT, participants were presented 80 color photographs of clothed men representing a wide range of age, race, ethnicity, and body characteristics, and selected photographs of men with whom they would hypothetically have sex.
- From the selected photographs, participants chose partners:
 - they most wanted to have sex with (MOST SEX)
 - they least wanted to have sex with (LEAST SEX)
 - most likely to get them pregnant (MOST FERTILE)
 - least likely to get them pregnant (LEAST FERTILE)
 - most likely to have an STI (MOST STI)
 - least likely to have an STI (LEAST STI)
- Participants indicated on a 100mm visual analog scale the likelihood they would engage in immediate, unprotected sex, or wait some delay to have condom- (CDT) or pregnancy-protected (PDT) sex.
- The order of partner conditions was randomized, and delays were presented in ascending order: 0 min, 1 min, 5 min, 30 min, 1 hr, 1 day, 3 days, 1 week, 2 weeks, and 1 month.
- Likelihood of engaging in delayed, protected sex as measured by distance from unprotected sex marked on the VAS were modeled for each partner condition with the hyperbola-like function $V = A / (1 + kD)^b$.
- Likelihood of engaging in protected sex at the 0-min delay and standardized area under the curve (AUC) were compared between pairs of partner conditions (e.g., MOST SEX vs. LEAST SEX) using Wilcoxon Signed Rank tests.
- Participants were compensated with a "fast pass" allowing them to proceed to the front of the medication line at Family Center once over the next seven days.

Results

Table 1. Demographics, sexual/reproductive history, and contraceptive history for all participants.

Characteristic	N = 13
Age (years ±SD)	30 ±4.7
Ethnicity (% Hispanic/Latina)	15%
Race (% Caucasian)	100%
Education (years ±SD)	12 ±1.0
Marital status (% never married)	100%
Employment (% unemployed)	83%
Sexual/Reproductive History	
Sexually active in last 3 months (%)	62%
STI History (% in lifetime)	85%
Pregnancies (mean ±SD)	3.4 ±2.6
Abortion (% 1 or more)	38%
Unintended pregnancy (% ever)	77%
Unwanted pregnancy (% ever)	31%
Not intending to become pregnant in next 6 months (%)	85%
Contraceptive History	
Lifetime prescription contraceptive use (%)	100%
Current prescription contraceptive use (%)	38%
Current non-prescription contraceptive use (%)	38%
No current contraceptive use (%)	23%

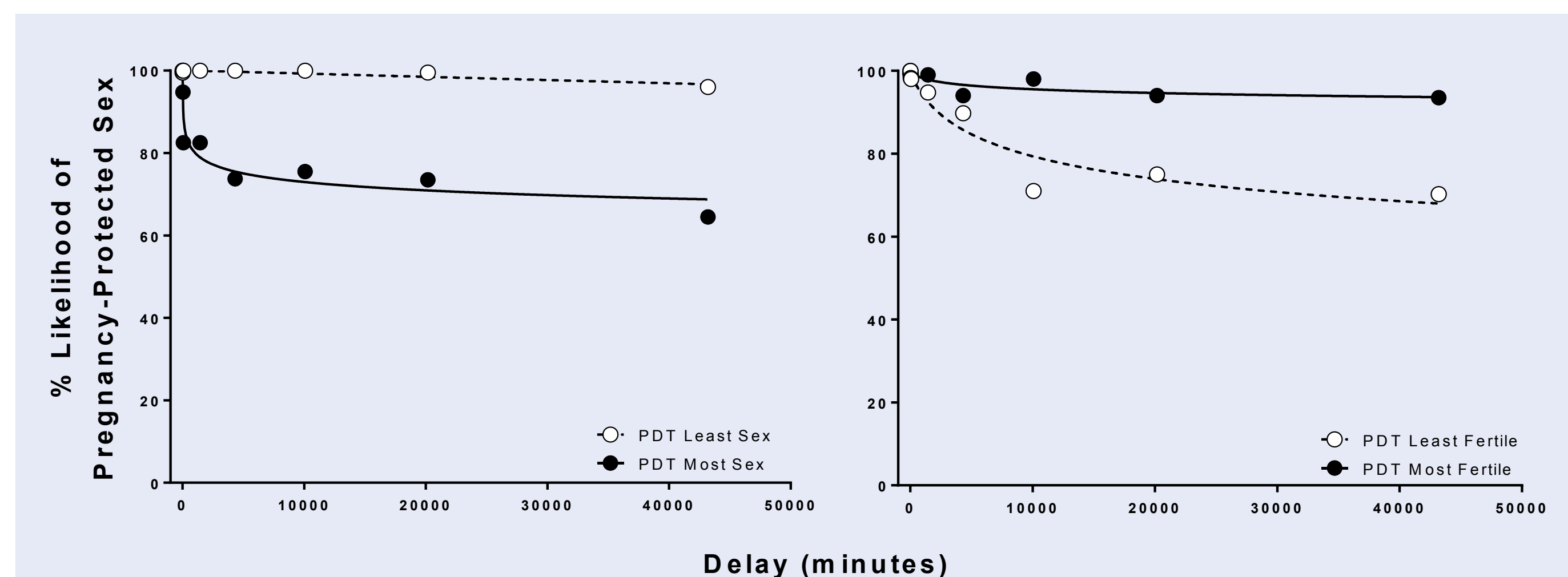


Figure 1. Percent likelihood of engaging in pregnancy-protected sex as a function of delay. Filled and open points represent different partner conditions, with desirability in the left panel and pregnancy risk in the right panel. Two women reported intending to become pregnant in the next 6 months and are excluded from these analyses.

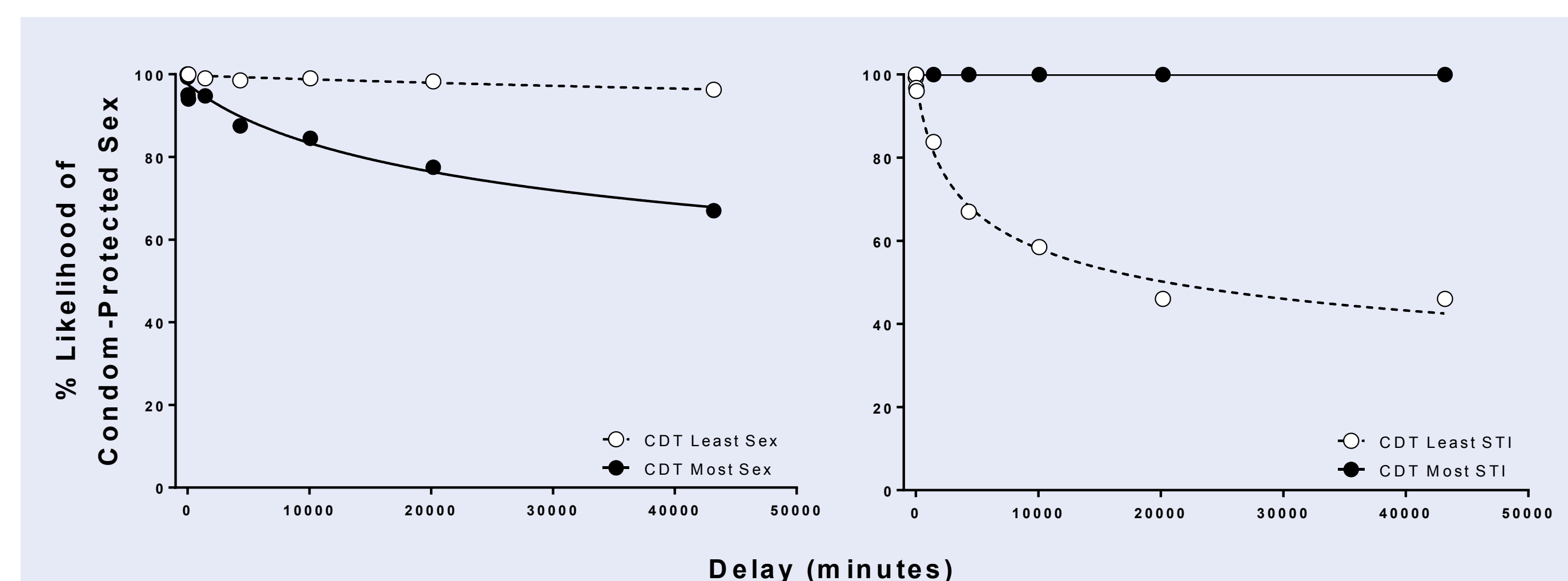


Figure 2. Percent likelihood of engaging in condom-protected sex as a function of delay. Filled and open points represent different partner conditions, with desirability in the left panel and STI risk in the right panel.

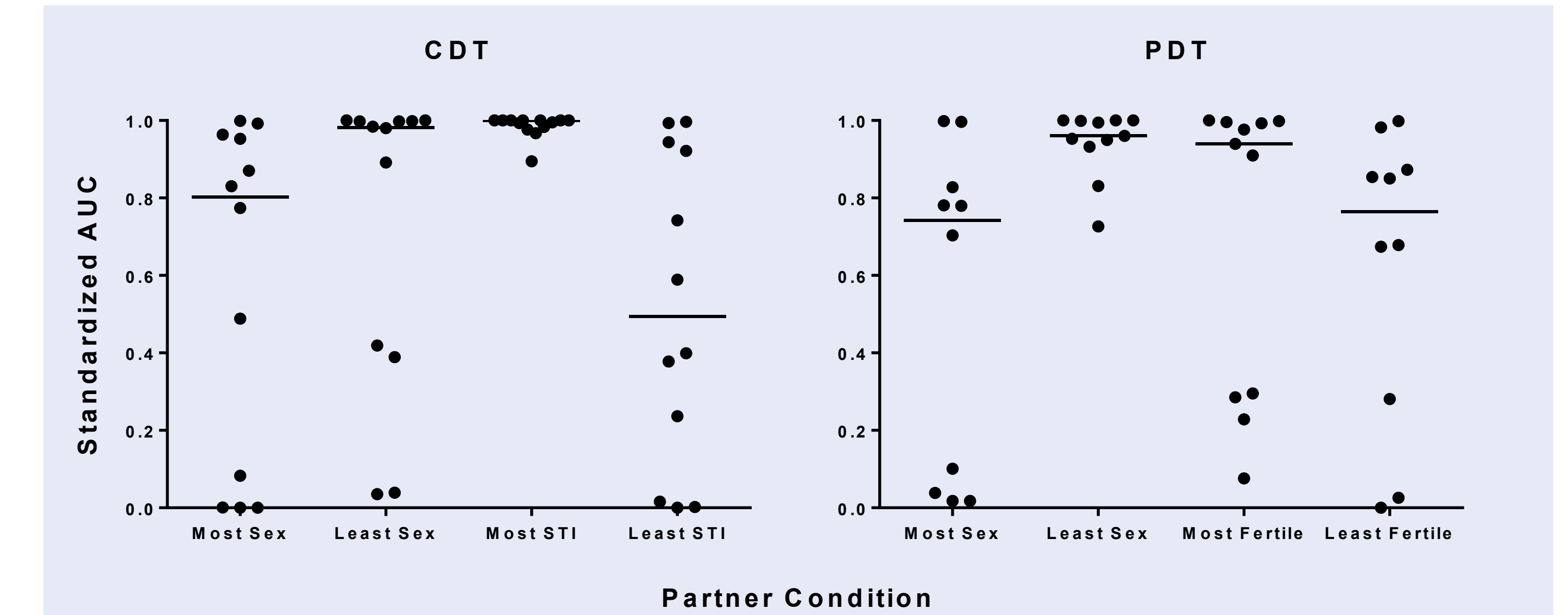


Figure 3. Standardized AUC for each participant in the CDT (left panel) and PDT (right panel). Horizontal lines represent the median for each partner condition.

- Likelihood of engaging in unprotected sex did not significantly differ between paired partner conditions at the 0-min delay in either the CDT or the PDT.
- Women discounted pregnancy-protected sex more steeply for MOST SEX than LEAST SEX partners ($Z = -2.60, p = .009$) (Fig. 1, left panel)
- Discounting of pregnancy-protected sex did not significantly differ between MOST FERTILE and LEAST FERTILE partners (Fig. 1, right panel).
- Women discounted condom-protected sex more steeply for LEAST STI compared to MOST STI partners ($Z = -2.09, p = .037$) (Fig. 2, right panel).
- Discounting of condom-protected sex did not significantly differ between MOST SEX and LEAST SEX partners (Fig. 2, left panel).
- There was substantial between-subjects variability in discounting for the MOST SEX, LEAST STI, and LEAST FERTILE partner conditions (Fig. 3).

Discussion

- Women with OUD discount condom- and pregnancy-protected intercourse as a function of delay to protection.
- There is some evidence that discounting of condom- and pregnancy-protected sex differs by hypothetical partner condition, however more data is needed.
- These findings provide preliminary evidence that decision making about sexual behavior in the domain of pregnancy risk is sensitive to delays.
- A larger sample is being collected to assess associations between discounting of condom- and pregnancy-protected sex and other measures of impulsivity, as well as with sexual and reproductive history.
- Delay discounting of pregnancy-protected sex may represent a behavioral mechanism that underlies engagement in pregnancy-risk behaviors, however the contribution of other behavioral economic factors, such as effort, probability discounting, and loss aversion, must be assessed.

References

- Heil SH, Jones HE, Arria A, Kaltenbach K, Coyle M, Fischer G, Stine S, Selby P, & Martin P. (2011). Unintended pregnancy among opioid-abusing women. *Journal of Substance Abuse Treatment, 40*, 199-202.
- Heil SH, Hand DJ, Sigmon SC, Badger GJ, Meyer MC, & Higgins ST. (in press). Using behavioral economic theory to increase use of effective contraceptives among opioid-maintained women at risk of unintended pregnancy. *Preventive Medicine*.
- Herrmann ES, Hand DJ, Johnson MW, Bader GJ, & Heil SH. (2014). Examining delay discounting of condom-protected sex among opioid-dependent women and non-drug-using control women. *Drug and Alcohol Dependence, 144*, 54-60.
- Secura GM, Madden T, McNicholas C, Mullersman J, Buckel CM, Zhao Q, & Peipert JF. (2014). Provision of no-cost, long-acting contraception and teenage pregnancy. *New England Journal of Medicine, 371*, 1316-1323.
- Terplan M, Hand DJ, Hutchinson M, Salisbury Afshar E, & Heil SH. (2015). Contraceptive use and method choice among women with opioid and other substance use disorders: A systematic review. *Preventive Medicine, 80*, 23-31.