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Impulsiveness, and trait displaced aggression among drug using female sex traders

Sarah E. Clingan [a], Dennis G. Fisher [a,*], William C. Pedersen [a], Grace L. Reynolds [b], Pamela Xandre [c]

[a] Psychology Department, California State University, Long Beach, 1250 Bellflower Boulevard, Long Beach, CA 90840, USA
[b] Health Care Administration Department, California State University, Long Beach, 1250 Bellflower Boulevard, Long Beach, CA 90840, USA
[c] School of Nursing, California State University, Long Beach, 1250 Bellflower Boulevard, Long Beach, CA 90840, USA

HIGHLIGHTS

- Women who traded sex for both drugs and money used crack, powder cocaine, and alcohol more.
- Women trading sex for both were higher on Impulsiveness Scales.
- Women trading for drugs only injected more and were higher on Displaced Aggression.
- Women trading for money only used marijuana more and more likely to use before sex.

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ABSTRACT

Objective: This study compared women who sex trade for drugs, money, or both compared to neither (did not sex trade), and introduced the concept of trait displaced aggression to the literature on sex trading.
Methods: Female participants ($n = 1055$) were recruited from a low-income area of southern California. Measures included: the Risk Behavior Assessment (RBA), Barratt Impulsivity Scale (BIS), Eysenck Impulsiveness Scale (EIS), and the Displaced Aggression Questionnaire (DAQ).
Results: Women who traded sex for both drugs and money used crack cocaine, powder cocaine, and alcohol significantly more, scored higher on the BIS, and the EIS, and were significantly older. Those who only sex traded for drugs used more amphetamine, heroin, and injected drugs more days. They were also higher on the DAQ and all of the DAQ subscales. Those who traded for money only used marijuana more and were more likely to use marijuana before sex.
Conclusions: This study may help address specific issues unique to those who sex trade for different commodities in that the drugs used are different and the underlying personality characteristics are different.

1. Introduction

Women who trade sex for drugs or money, a practice known as sex trading, are at risk for Human Immunodeficiency Virus (HIV) infection and other sexually transmitted infections (STIs)(El-Bassel, Simoni, Cooper, Gilbert, & Schilling, 2001). Sex traders who had more than 50 partners in the last 10 years had an HIV prevalence rate of 47.6% versus a prevalence rate of 23.2% for women who reported that they did not sex trade (Astemborski, Vlahov, Warren, & Solomon, 1994). These findings hold true even when controlling for other risk factors such as crack use, duration of injection drug use and history of other sexually transmitted infections (STIs) (Astemborski et al., 1994).

One of the reasons that sex trading transmits disease is because of inconsistent condom use among those who buy sex. For instance, men who reported that they buy sex from women were more likely to report an unwillingness to use a condom (39% versus 5.4%) (Decker, Raj, Gupta, & Silverman, 2008). In addition, some clients will offer more money to their sex trading partners to have unprotected sex versus sex with a condom (Deering et al., 2013).

Furthermore, women who sex trade for drugs or money and who are HIV-positive are more likely to report inconsistent condom use with casual partners than HIV-positive women who do not sex trade for drugs or money (Latka et al., 2006). Additionally, drug using sex traders are more likely to participate in risky types of sex. For example, drug using women who sex trade are more likely to have anal sex, than drug using women who do not sex trade (Reynolds, Latimore, & Fisher, 2008). Women who have unprotected anal sex are at a greater risk for STIs than women who only have unprotected vaginal sex (Jenness et al., 2011). These high-risk sexual behaviors are troublesome,

* Corresponding author at: Psychology Department, 1250 Bellflower Boulevard, Long Beach, CA 90840, USA.
E-mail address: dennis.fisher@csulb.edu (D.G. Fisher).

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given the dangerous nature of HIV and the increased rates of infection among women who sex trade and their sexual partners. The use of drugs within this population further complicate the situation, as injection drug users still account for a large proportion of newly diagnosed HIV cases (Santibanez et al., 2006).

Drug use and abuse has been strongly correlated with sex trading. More specifically, crack cocaine use is often cited in the literature as being highly correlated with sex trading (Ferri & Gossop, 1999a; Latkin, Hua, & Forman, 2003; Risser, Timpson, McCurdy, Ross, & Williams, 2006; Weatherby, Shultz, Chitwood, & McCoy, 1992). Heroin use and risky needle sharing have also been shown to be associated with sex trading for drugs or money (Spittal et al., 2003), and a Mexican study showed that injection drug use was inversely associated with stopping sex work (El-Bassel et al., 2001; Gaines et al., 2015). Methamphetamine use is also associated with sex trading (Kang et al., 2011; Parry, Pluddemann, Myers, Wechsberg, & Flisher, 2011; Semple, Strathdee, Zians, & Patterson, 2011; Shannon et al., 2011; Urada et al., 2014), but the research on the increased level of sexual risk among these populations of sex workers is mixed. For instance, Shannon et al. (2011) recruited 255 female street-based sex workers from Vancouver Canada to better understand risk factors associated with methamphetamine use among those who sex trade. Shannon et al. did not find a relationship between using methamphetamine and an increase in sexual risk. Sexual risk was defined as having sex without a condom with clients, exchanging sex while high, and having experienced client-perpetrated violence. In addition, Urada et al. (2014) conducted a study with 498 female bar/spa sex workers in the Philippines and found that sex work was associated with methamphetamine use and alcohol intoxication during sex, but inversely associated with daily alcohol use. In addition, Parry et al. (2011) reviewed the research on eight Cape Town South African studies and found that there was an increased sexual risk among methamphetamine users. Methamphetamine users were more likely to have sex at an earlier age, to have more casual sex, and less likely to use condoms during sex. Female methamphetamine users were also more likely to have anal intercourse in general (Reynolds, Fisher, Napper, Fremming, & Jansen, 2010; Reynolds et al., 2008). Female methamphetamine users were also more likely to have anal intercourse on the same days on which they also took methamphetamine (Reynolds, Fisher, Laurenceau, & Fortenberry, 2015).

The existing literature on sex trading has yet to show the pattern of sex trading behavior among women who sex trade for drugs, money and both money and drugs, while using a sample of women who do not sex trade as a comparison. This disaggregation may have important implications for intervention development. Furthermore, past studies on sex trading have been limited in showing the psychological underpinnings of sex trading behavior. The present study seeks to address these two gaps in the literature by demonstrating a pattern among different types of sex traders while utilizing psychological measures of impulsivity, and trait displaced aggression to help explain sex trading behavior.

1.1. Impulsiveness and sex trading

One psychological factor that is important for understanding sex trading behavior is impulsiveness. Impulsiveness refers to the tendency to have rapid, unplanned reactions toward stimuli without forethought (Patton, Stanford, & Barratt, 1995). Impulsivity is a multifactorial construct and can be separated into three subtraits: cognitive impulsiveness, motor impulsiveness, and non-planning impulsiveness (Stanford et al., 2009). Cognitive impulsiveness is characterized by making quick decisions, motor impulsiveness is characterized by acting without thinking, and non-planning impulsiveness is characterized by a lack of thinking about the future (Patton et al., 1995). A Rhode Island study found an association between impulsivity as measured by the Eysenck I7 Questionnaire and engaging in exchange sex (Hayaki, Anderson, & Stein, 2006).

While there is limited research on the association between impulsivity and sex trading, there is literature on the relationship between impulsivity and risky sexual behavior (Black, Serowik, & Rosen, 2009; Donohew et al., 2000; Hayaki et al., 2006; Hayaki, Anderson, & Stein, 2012; Lejuez, Bornovalova, Daughters, & Curtin, 2005). For example, impulsive decision making has been shown to be associated with risky sexual behavior in adolescence (Donohew et al., 2000). Furthermore, Hayaki et al. found that after controlling for substance use, impulsivity was still a predictor of sexual risk. In addition, Winters, Botzet, Fahnhorst, Baumel, and Lee (2008) assessed the relationship between impulsivity, drug use, and sexual risk. Winters et al. (2008) found that impulsivity, drug use, and sexual risk were significantly associated with each other, and drug use and sexual risk was partly mediated by impulsivity.

1.2. Aggression and sex trading

Sex trading has been found to be associated with many types of psychological abuse (Deb, Mukherjee, & Mathews, 2011; El-Bassel et al., 2001; Senn, Carey, & Vanable, 2008). For instance, having a history of childhood sexual abuse has been linked to risky sexual behavior, especially sex trading for money (Gilchrist, Gruer, & Atkinson, 2005; Senn et al., 2008; Wu, Schairer, Dellor, & Grella, 2010). In addition to the link between sex trading and childhood sexual abuse, there appears to be a link between substance use disorders, childhood sexual abuse, childhood physical abuse, and aggression (Banducci, Hoffman, Lejuez, & Koenen, 2014). Those who reported childhood sexual abuse were more likely to be arrested for prostitution, were more likely to report sex trading for cocaine, and were more likely to have been arrested for assault. In addition, Deb et al. (2011) found that sexually abused trafficked girls from Kolkata, India had higher rates of aggression ($M = 76.39$, $SD = 19.8$) than non-abused trafficked girls ($M = 66.20$, $SD = 17.0$) from the same town. While these studies link the relationship between abuse, sex trading, and aggression, the specific pattern of behavior is unknown. It is possible that people who suffer from abuse may feel as if they cannot focus their anger on their abuser and may, in turn, displace their feelings on a different target. Displaced aggression is different than direct aggression in that displaced aggression is putting anger on a different target than the source of the anger. For instance, a sex trader may be angry at her pimp, but yells at or mistreats her transactional sex partner, as a result. This type of displaced aggression may be the source of the finding for the Deb et al. study.

Risser et al. (2006) used a sample of 193 female African American crack cocaine smokers to better understand the psychological correlates among those who sex trade for money. Risser et al. assessed the levels of hostility for women who reported current sex trading practices, previous sex trading practices, and those who never sex traded. They found a significant trend, with current sex traders reporting higher levels of hostility (Risser et al., 2006). Very little research has been done on sex trading and aggression (Risser et al., 2006), and no known research has been done on the association between sex trading and trait displaced aggression.

1.3. The present study

Previous literature on sex trading for drugs or money has combined these two groups into a single homogeneous group for analysis purposes (Astemborski et al., 1994). The first study to compare sex trading for drugs, money, or both analyzed data from the National Institute on Drug Abuse (NIDA) Cooperative Agreement that took place 1991–1998 (Kwiatkowski & Booth, 2000). They found that those who traded for drugs and for both were more likely to smoke crack. They also found that women who exchanged sex for money only were more likely to inject. A second study done in Baltimore found that those who only traded for drugs were more at risk for HIV because of lower condom use (Dunne et al., 2014). Because the sample size was small ($n = 92$),

they were only able to compare those who traded for both compared to those who traded for drugs only.

An additional motivation for the current study was that the relationship between sex trading and impulsivity, and trait displaced aggression has been understudied. The purpose of the current study was to model differences among women who reported sex trading for drugs, money, and both drugs and money, compared to women who did not report sex trading, on drug use, impulsivity, and trait displaced aggression. The current study had the advantages of a large sample size and included psychological measures that were not used in previous studies.

2. Methods

2.1. Participants

Approximately 1055 women aged 14 and older were recruited into the present study, to assess differences between women who sex trade for drugs, money, and both drugs and money. Participants were recruited through programs operated by the Center for Behavioral Research and Services (CBRS). CBRS is a Human Immunodeficiency Virus (HIV) and sexually transmitted infections (STIs) testing site and is ideal to recruit women who have sex traded for drugs or money because it is located in a low-income neighborhood between two gang-injunction high-crime areas. Participants were eligible to participate in the study if they were 14 years of age or older, female, and willing to participate in a study that may last 1 h. Participants were compensated with cash or non-cash incentives ranging from $5 to $20 depending upon funding source at the time. Participants were excluded if, at the time of the study, they were unable to give signed informed consent. For instance, if they were intoxicated, and/or mentally incapable of understanding the consent, then they were excluded. All participants had an opportunity to get free STI testing, whether or not they agreed to participate in the study. Participants who were aged 14 to 17 gave their own consent to participate (California state law allows for minors to give consent to be tested for STI without parent's consent), and all parts of the study had prior approval by the California State University, Long Beach (CSULB) Institutional Review Board (IRB).

2.2. Recruitment

Participants were recruited by multiple programs operated by CBRS. Participants were recruited through the Counseling and Food Bank Program (CFBP), Multiple Morbidities Testing Program (MMTP), and Behavioral Aspects of Rapid Testing Acceptance Program (BSARTA) and many participants were eligible to receive services under more than one program.

2.3. Research protocol

All study participants signed an informed consent form approved by the CSULB IRB. Once consented, they completed a structured interview that lasted approximately 45 min. For the purpose of this study, the Risk Behavior Assessment (RBA), Barratt Impulsiveness Scale (BIS), Eysenck Impulsiveness Scale (EIS), and the Displaced Aggression Questionnaire (DAQ) were used. Once the participants completed study-related instruments, they were given the opportunity to receive HIV and STI testing by a licensed phlebotomist, were compensated, and thanked for participation. All phlebotomists were licensed by the State of California and certified as HIV pre and posttest counselors by Los Angeles County.

2.4. Instruments

2.4.1. Risk Behavior Assessment

The Risk Behavior Assessment (RBA) was developed by the Community Research Branch of National Institute on Drug Abuse (NIDA) in collaboration with AIDS Cooperative Agreement programs grantees (NIDA, 1993). The RBA was administered face-to-face in a structured interview that lasted 15 to 30 min and covered factors, such as drug use, sexual behavior, drug treatment history, incarceration, history of STI and homelessness. For instance, the RBA assesses whether someone has ever used drugs and how many times that particular drug was taken in the last 30 days. For example, "Have you ever used crack (smokeable cocaine)?", and "How many days have you used crack in the last 30 days?" are questions on the RBA that assess drug use. The RBA has been shown to have good reliability and validity (Dowling-Guyer et al., 1994; Fisher, Reynolds, Wood, & Johnson, 2004; Johnson, Pratt, Neal, & Fisher, 2010). In order to assess sex trader type, the questions "Have you ever given sex to get money?", and "Have you ever given sex to get drugs?" were used. The sample used for the reliability and validity studies of the RBA had 26.1% female respondents (Dowling-Guyer et al., 1994).

2.4.2. Barratt Impulsiveness Scale and Eysenck Impulsiveness Scales

The Barratt Impulsiveness Scale (BIS) and Eysenck Impulsiveness Scale (EIS) were used to assess impulsivity. The BIS is a 30-item questionnaire that is scored on a 4-point scale (*Rarely/Never* = 1, *Occasionally* = 2, *Often* = 3 *Almost Always/Always* = 4) (Patton et al., 1995). Higher scores indicate higher levels of impulsivity. The BIS has three subtraits, cognitive impulsiveness (making quick decisions), motor impulsiveness (acting without thinking), and non-planning impulsiveness (lack of thinking about the future). The BIS has been shown to have good reliability and validity across the various question types (Stanford et al., 2009). Participants were asked to state how much they agree with statements, such as "I do things without thinking" and give a response that corresponds to the scale.

A review of the psychometric properties of the BIS concluded that there was both reliability and criterion-related validity across a variety of samples (Vasconcelos, Malloy-Diniz, & Correa, 2012). A study of adult inmates that included 34.8% female found that gender was not related to scores on the BIS and that impulsivity was related to use of all drugs except marijuana (Bernstein et al., 2015). An updated psychometric paper on the BIS that used a sample that included 1187 female adults (75% of the sample) found no gender differences for either total score or the second-order subscales (Stanford et al., 2009). In contrast to these studies, Lejuez et al. reported that of 180 inpatient residents in a substance abuse treatment program, females had higher scores on the BIS and that the BIS scores were related to crack/cocaine dependence and use (Lejuez, Bornovalova, Reynolds, Daughters, & Curtin, 2007). A study of 137 female offenders found the BIS total and subscales to be significantly different across different categories of antisocial personality disorder (Warren & South, 2006). A study that included 137 women (56% of the sample) reported coefficient alphas for the BIS subscales of 0.61 to 0.72 (Miller, Joseph, & Tudway, 2004).

The EIS is a subscale of the Eysenck Impulsiveness-Venturesomeness-Empathy questionnaire (Eysenck & Eysenck, 1978). The subscale is a 19-item questionnaire that requires subjects to state "yes" or "no" on each question. Participants were asked to state "yes" or "no" to statements, such as "Do you generally do and say things without stopping to think?" and "Do you usually think carefully before doing anything?" Higher scores indicate greater impulsivity. The EIS was originally developed on a sample that included 787 (66% of the sample) female adult subjects and the data showed no sex differences on impulsiveness (Eysenck & Eysenck, 1978). The EIS has been shown to correlate negatively with activity in the left orbitofrontal cortex, amygdala and precuneus, and bilaterally in the cingulate cortices during response inhibition on a sample of women with borderline personality disorder and matched controls (Mortensen, Rasmussen, & Haberg, 2010). A study of 100 female prisoners found positive relationships between substance use severity and EIS scores (Mooney et al., 2008). A study of 227 women showed high positive correlations with Sensation Seeking and dimensions of the Eysenck Personality Questionnaire (Goma-i-Freixanet, 2001).

2.4.1. Displaced Aggression Questionnaire

The Displaced Aggression Questionnaire (DAQ) is a 31-item questionnaire used to assess trait displaced aggression. The DAQ is scored on a 7-point scale (*extremely uncharacteristic of me* = 1, and *extremely characteristic of me* = 7). The DAQ has been shown to have good internal consistency, test-retest reliability, convergent and discriminant validly (Denson, Pedersen, & Miller, 2006). Participants were asked to state how much they agree with statements, such as "I take my anger out on innocent others", and "If I have had a hard day at work or school, I'm likely to make sure everyone knows about it" and give a response that corresponds to the scale. Additionally, the DAQ has three subscales that consist of an affective dimension (angry rumination, 10 items), a cognitive dimension (revenge planning, 11 items), and behavioral dimension (displaced aggression, 10 items).

The initial item selection phase of the development of the DAQ employed a large college sample ($n = 521$) that was composed predominantly of female participants (e.g., 71% female and 29% male) (Denson et al., 2006). The three-factor structure of the DAQ was subsequently replicated in a large national community sample of 1013 Internet respondents (mean age = 39 years, $SD = 12.31$, range = 18 to 83; 84% female, 16% male). Although Whites were overrepresented, all major ethnic groups were present (87% White, 3.5% multiracial, 2.8% Latino, 2.4% Black, 1.4% Asian, 1% Native American, 0.4% Middle Eastern). Results indicated that internal consistency reliability was high for the total scale (alpha = 0.95, Spearman–Brown split-half $r = 0.86$) and subscales – angry rumination (alpha = 0.927), revenge planning (alpha = 0.930), and displaced aggression (alpha = 0.926). Follow-up studies showed good test-retest reliability at both 4 weeks ($r = 0.77$) and 11-weeks ($r = 0.87$).

2.5. Statistical analyses

The sample sizes of each instrument varied slightly in that "Refused" and "Don't know/unsure" responses were coded to missing. In order to test the differences between four sex trading categories, women were grouped based on lifetime sex trading behavior. Women who reported that they: (a) had ever given sex to get drugs only (drugs-only group), (b) women who reported that they had given sex to get money only (money-only group), (c) women who reported "yes" responses on both drugs and money (both-drugs-and-money group), and (d) women who reported that they never sex traded for drugs or money(neither-drugs-nor-money group). Describing the relationship among these four sex-trading groupings and demographics is presented in Table 1. The relationships of the four sex-trading groups on employment, ethnicity, homelessness, and sexual preference were tested using chi-square tests of independence. The relationship for age was assessed with a one-way ANOVA, and the relationships for both education and income were assessed with Kruskal-Wallis test because these variables were ordinal. Post-hoc comparisons for the Kruskal-Wallis Test were performed with the Dwass, Stell, Crichlow-Fligner method (Crichlow & Fligner, 1991). To assess whether drug use varied by age in this sample, *t*-tests of ever/never use of each drug was performed.

In order to assess the relationship of number of days of drug use in the 30 days prior to interview and sex trading, one-way between-subjects ANOVAs with four groups was performed with effect sizes reported as η^2 (See Table 2). Furthermore, individual group comparisons were conducted using the Tukey-Kramer Test in order to control for the experimentwise error rate. In order to assess the relationship of drugs used immediately before or during sex, chi-square tests were used. In order to explain the difference between sex trader types on the psychological scales, one-way between-subjects ANOVAs with four groups was performed (See Table 3). Effect sizes, reported as η^2 are provided where relevant. One rule of thumb given for interpretation of the η^2 is to consider an effect size of 0.01 as small, an effect size of 0.06 to be medium, and an effect size of 0.14 to be considered as large (Nolan & Heinzen, 2014). Because of varying funding requirements, the BIS and the EIS were used 2005–2014 which resulted in a sample size of $n = 1055$, the DAQ was used 2005–2009 which resulted in a sample size of $n = 270$. In order to assess the internal consistency of the various psychological measures, raw coefficient alphas (Cronbach, 1951) are reported in Table 3. To assess whether types of drug users in the sample changed over time, a Cochran-Armitage test for trend (Margolin, 1988) was performed. This covered the period of 2005–2014 and was limited to only the women in this sample. To assess whether the types of sex trading varied over time, tests of trend over time for all pairwise comparisons of the four sex trading groups were also performed.

Table 1
Demographics among sex trading groups.

	Drugs only ($n = 30$)	Money only ($n = 129$)	Drugs and money ($n = 286$)	No trade ($n = 610$)			
Demographics	*n*(%)	*n*(%)	*n*(%)	*n*(%)	χ^2	*df*	*p*
Employed	1(3)	7(5)	21(7)	157(26)	66.8	3	0.0001
Ethnicity					65.5	9	0.0001
White	13(43)	33(26)	80(28)	166(27)			
Black	4(13)	67(52)	160(56)	229(38)			
Hispanic	5(17)	12(9)	37(13)	122(20)			
Other	8(27)	17(13)	9(3)	90(15)			
Homeless	15(50)	66(52)	160(56)	168(28)	76.2	3	0.0001
Sexual Preference					89.0	6	0.0001
Heterosexual	14(47)	70(55)	137(49)	451(75)			
Lesbian	2(7)	5(4)	25(9)	51(8)			
Bisexual	14(47)	53(41)	119(42)	100(17)			
	M(*SD*)	*M*(*SD*)	*M*(*SD*)	*M*(*SD*)	*F*		
Age	$36.0(11.04)_b$	$38.6(11.48)_{ad}$	$42.3(10.54)_{abc}$	$35.4(13.13)_{cd}$	20.67	3,1050	0.0001
Times give sex for drugs	$0.8(2.09)_a$	$0(0)_b$	$4.2(11.34)_{abc}$	$0(0)_c$	20.67	3,1044	0.0001
Times give sex for money	$0(0)_a$	$3.4(10.18)_{bd}$	$6.9(19.63)_{abc}$	0(0)cd	27.29	3,1040	0.0001
					χ^2	*df*	*p*
Education[a,b]	4.1(1.92)	$3.7(1.78)_b$	$3.5(1.68)_a$	$4.5(1.80)_{ab}$	60.58	3	0.0001
Income[a,c]	1.4(0.74)	1.6(0.82)	$1.5(0.83)_a$	$1.8(1.06)_a$	23.52	3	0.0001

Note. Means in a row sharing subscripts are significantly different from each other. The ANOVA pairwise comparisons were with Tukey-Kramer procedures and the Kruskal-Wallis comparisons were done with the Dwass, Steel, Critchlow-Fligner method.
[a]Ordinal variables were tested with Kruskall-Wallis test. [b]Scale is 0 = No formal schooling, 1 = Eighth grade or less, 2 = Less than high school graduation, 3 = GED, 4 = High school graduation, 5 = Trade or technical training, 6 = Some college, 7 = College graduation. [c]Scale is 1 = Less than $500, 2 = $500–$999, 3 = $1000–$1999, 4 = $2000–$3999, 5 = $4000–$5999, 6 = $6000 or more.

Table 2
Drug use by sex trading groups.

	Drugs only	Money only	Drugs & money	Neither			
	M(*SD*)	*M*(*SD*)	*M*(*SD*)	*M*(*SD*)	*F*	*df*	η^2
Crack – 30 days	2.7(7.91)	$2.4(7.13)_{ac}$	$5.3(9.83)_{ab}$	$0.7(4.18)_{bc}$	30.19	3,1050	0.0794
Alcohol – 30 days	6.3(9.77)	$7.1(8.88)_{b}$	$8.7(11.27)_{a}$	$3.6(6.73)_{ab}$	23.94	3,1041	0.0645
Cocaine – 30 days	1.2(3.37)	$0.1(0.73)_{a}$	$1.9(6.00)_{ab}$	$0.06(0.42)_{b}$	24.14	3,1048	0.0646
Marijuana – 30 days	7.2(11.68)	$8.3(12.30)_{a}$	$7.1(11.16)_{b}$	$3.5(8.57)_{ab}$	14.06	3,1048	0.0387
Heroin – 30 days	$2.5(7.78)_{ab}$	$0.4(2.89)_{ac}$	$1.9(6.23)_{cd}$	$0.2(1.73)_{bd}$	15.34	3,1049	0.0420
Amphetamine – 30 days	$5.3(9.88)_{a}$	$2.7(6.76)_{bd}$	$4.5(9.22)_{bc}$	$1.0(4.40)_{acd}$	21.37	3,1049	0.0576
Time injected – 30 days	13.5(40.35)	$2.2(9.49)_{a}$	$8.9(29.97)_{ab}$	$2.0(22.37)_{b}$	6.94	3,1047	0.0195
	n(%)	*n*(%)	*n*(%)	*n*(%)	χ^2	*df*	*p*
Crack before sex	2(7)	18(14)	73(26)	11(2)	127.3	3	0.0001
Alcohol before sex	9(30)	61(47)	134(48)	148(24)	60.1	3	0.0001
Cocaine before sex	0(0)	3(2)	31(11)	4(1)	60.7	3	0.0001
Marijuana before sex	7(23)	40(31)	86(30)	82(14)	43.8	3	0.0001
Heroin before sex	2(7)	4(3)	30(11)	7(1)	44.7	3	0.0001
Amphetamine before sex	6(20)	18(14)	68(24)	35(6)	63.0	3	0.0001

Note. Means or proportions in a row sharing subscripts are significantly different from each other. 30-day variables are the number of days used the drug in the 30 days prior to interview. The before-sex variables were whether they used the drug immediately before or during sex.

3. Results

3.1. Sample description

A total of 1055 participants were recruited into the present study from 2005 to 2014. All participants were female and a majority of the sample identified as Black (44%, 460/1052) or White (28%, 292/1052). The next largest racial group identified as Hispanic (17%, 176/1052), followed by Other (12%, 124/1052). Whites were the largest percentage of those trading only for drugs, whereas Blacks were the largest percentage trading sex for money only and for drugs and money (see Table 1). The mean age of the sample was 38 years ($SD = 11.89$), ranged from 14 to 100 years of age, and the drugs and money group had the oldest mean age. Most of the participants identified as heterosexual (65%, 672/1041), followed by bisexual (27%, 286/1041) or lesbian (8%, 83/1041). Those who did not sex trade had higher levels of education and income. In order to report the relative frequency of the activities of trading sex for money and trading sex for drugs in the 30 days prior to interview the data are shown on Table 1. Those who traded sex for both drugs and money had the highest frequencies of both activities.

3.2. Drug use last 30 days

Table 2 shows the differences between the four groups for drug use in the last 30 days. There are several noteworthy findings. As shown, women who reported that they sex traded for both drugs and money were more likely to report that they smoked crack more days ($M = 5.3$) versus women who reported that they sex traded for drugs ($M = 2.7$) or money only ($M = 2.4$). Women who sex traded for drugs only used amphetamine more days ($M = 5.3$), versus women who did not sex trade ($M = 1.0$). Women who traded sex for money only smoked marijuana more days ($M = 8.3$) than either the both ($M = 7.1$) or neither ($M = 3.5$) groups.

The women who traded for both drugs and money were more likely to use crack, alcohol, cocaine, heroin, and amphetamine before or during sex. The women who sex traded for money only were more likely to use marijuana before or during sex. There were significant tests for trend in that the proportion of the sample who never drank alcohol, never used crack, and never used cocaine increased over time. Women who had ever used crack, cocaine, heroin, and amphetamine were significantly older than those who had not ever used these drugs. There were only two significant findings of the tests of trend for the types of sex trading over time. There was a significant increase in those who traded sex for money compared to those who did not sex trade over time, and there was a significant increase in those who traded sex for money compared to those who traded only for drugs.

3.3. Psychological measures among female sex traders and non-sex traders

As shown in Table 3, the overall ANOVAs showed that the groups exhibited significant differences in all scales (See Table 3). The Tukey-Kramer test showed that BIS total scores and all BIS subscale scores among women who sex traded for drugs, money, and both drugs and money were significantly higher than those who did not sex trade. There was a similarly large effect for the EIS with those trading sex having higher scores on the EIS. The results also showed that the groups exhibited significant differences in overall DAQ scores (trait displaced aggression measure). Further tests were conducted to assess the

Table 3
Psychological measures among sex trading groups.

	Drugs Only	Money Only	Drugs & Money	Neither					
	M(*SD*)	*M*(*SD*)	*M*(*SD*)	*M*(*SD*)	*F*	*df*	η^2	*p*	α
DAQ total	$130.2(41.57)_{a}$	$108.8(52.78)_{b}$	91.5(46.5)	$79.5(39.6)_{ab}$	6.45	3,248	0.0724	0.0003	0.967
Angry rumination	$50.0(11.97)_{a}$	$44.2(19.03)_{b}$	$37.2(18.80)_{c}$	$30.9(15.15)_{abc}$	8.15	3,252	0.0884	0.0001	0.935
Revenge planning	$42.6(16.97)_{a}$	34.1(19.72)	29.3(17.68)	$25.2(14.78)_{a}$	4.90	3,248	0.0560	0.0025	0.930
Displaced aggression	$37.6(16.70)_{a}$	30.0(18.03)	24.9(15.33)	$23.3(18.50)_{a}$	3.58	3,252	0.0409	0.0145	0.930
BIS Total	$76.3(12.01)_{b}$	$74.7(12.39)_{c}$	$78.0(13.48)_{a}$	$67.0(13.42)_{abc}$	46.73	3,990	0.1240	0.0001	0.862
Attentional	$19.7(3.56)_{b}$	$18.8(4.39)_{c}$	$20.0(4.56)_{a}$	$17.1(4.59)_{abc}$	28.03	3,1015	0.0765	0.0001	0.702
Motor	$26.8(5.36)_{b}$	$26.3(5.33)_{c}$	$27.4(6.22)_{a}$	$23.8(5.42)_{abc}$	28.56	3,1020	0.0775	0.0001	0.706
Non-planning	$30.3(5.78)_{b}$	$29.3(5.70)_{c}$	$30.6(5.77)_{a}$	$25.9(5.87)_{abc}$	44.68	3,1028	0.1153	0.0001	0.738
EIS	$11.8(4.55)_{c}$	$10.7(4.22)_{ad}$	$12.2(4.51)_{ab}$	$6.3(4.68)_{bcd}$	49.29	3,986	0.1304	0.0001	0.852

Note. Means in a row sharing subscripts are significantly different from each other. DAQ = Displaced Aggression Questionnaire, BIS = Barratt Impulsivity Scale, EIS = Eysenck Impulsiveness Scale.

difference between groups on the three subscales of the DAQ. As shown in Table 3, significant differences between the sex trading groups and the non-sex-trading group were found for the total DAQ and all DAQ subscales. All of the scales showed very good to excellent coefficient alpha values.

4. Discussion

Most previous research on sex trading has lumped women who trade sex for money with women who trade sex for drugs and women who trade for both into a single group for analysis purposes. The groundbreaking study by Kwiatkowski and Booth (Kwiatkowski & Booth, 2000) introduced the paradigm of separating these three groups from each other for analysis purposes. This was followed-up by Dunne et al. to the extent that they could with their small sample size (Dunne et al., 2014). We have tried to follow in this tradition, and we had a large enough sample that enabled us to introduce additional refinements into this approach to the study of drug using sex traders. The desirability of being able to make these distinctions has been suggested by El-Bassel et al. (El-Bassel et al., 2001). In addition, we had access to a personality measure, trait displaced aggression that was not available in previous studies.

Even though the results of this study further confirm that drug use and sex trading are related (Kang et al., 2011; Latkin et al., 2003; Spittal et al., 2003), the current study allows for the demonstration of the pattern of drug use for each group. This would not have been possible if sex trader data had been treated as a single homogeneous group. For instance, women who reported that they sex traded for both drugs and money were more likely to smoke crack, which is consistent with Kwiatkowski and Booth (Kwiatkowski & Booth, 2000). A New York study also found a relationship between crack use and sex trading (El-Bassel et al., 2001), as did a study in Brazil (Ferri & Gossop, 1999b). These women were also more likely to have used crack, powder cocaine, and amphetamine before sex. The women in our study who traded for money, and drugs and money, used more alcohol. Alcohol use by sex traders has been associated with unprotected sex (Chen, Li, Shen, Zhou, & Tang, 2013). Conversely, women who reported that they sex traded for drugs only reported that they used amphetamine more, have used heroin more, and have injected drugs more. Given that this group was also the youngest of the three sex trading groups, this indicates that women in this group may be at significant risk and may have more severe substance dependence. Women who use amphetamine maybe more willing to sex trade for amphetamine because of the social environment of amphetamine use and the hypersexual nature of amphetamine use.

There was an increase in those who traded sex for money over time. This may indicate a response to the economic difficulties that took place in this part of Los Angeles during this time period. Part of the economic difficulties reflected the national economic downturn, but in addition the Los Angeles-Long Beach-Anaheim large metropolitan area (LMA) consistently had one of the highest unemployment rates in the country and ranked between 44 and 48 out of 51 LMAs in the US and still has a very difficult time with economic recovery (United States Department of Labor Bureau of Labor Statistics, 2016). This may have been especially true for non-White ethnicities and the sex trading for money group had the lowest percentage of Whites.

Past research has shown that impulsive decision making was associated with risky sexual behavior in adolescence (Donohew et al., 2000). Research has also demonstrated an association between the EIS and general exchange sex (Hayaki et al., 2006). However, it was previously unknown whether this pattern of results would be similar to those who had sex traded for drugs. No significant differences were found among the sex trading groups with the exception of the EIS total score being significantly different between women who trade for money only compared to those who trade for both drugs and money. For the most part, the results indicate that women who sex traded in general are more impulsive than women who did not sex trade. These findings were consistent with two separate measures of impulsivity (BIS and EIS).

While a link has been made between sex trading and hostility among female crack cocaine users (Risser et al., 2006), the findings of the relationship between trait displaced aggression and sex trading appear to be novel. Given that some sex traders have a history of abuse (Gilchrist et al., 2005; Senn et al., 2008; Wu et al., 2010), it is believed that sex traders may harbor angry feelings for their previous abusers and displaced their aggression onto an unrelated target. In support of this assumption, results showed that women who had sex traded in general had higher overall trait displaced aggression scores, with women who sex traded for drugs only having overall higher scores than the other groups. In addition, the sex-trading-for-drugs-only group had the highest percentage of Whites, and bisexuals, and used heroin and amphetamines more, and injected drugs more. The DAQ results suggest that women who sex traded in general, but especially those who traded only for drugs, may displace their aggression both in an affective (angry rumination), cognitive (revenge planning) manner, and a behavioral manner (displaced aggression). This further supports the assumption that sex traders harbor angry feelings, and do not act on their anger in an outward behavioral manner at direct targets.

4.1. Limitations

This study has limiting factors that restrict its generalization to other groups. There was a smaller sample size that were administered the DAQ. Furthermore, the group of those who reported that they sex traded for drugs only had a smaller sample size than the other groups. The authors believe that women who sex trade for drugs may not recognize sex trading for drugs as sex trading behavior resulting in under reporting. Future studies need to take this into account and be more specific when eliciting information about sex trading practices.

4.2. Strengths

One of the many strengths of this study was the recruitment protocol. For instance, CBRS is an HIV and STI testing site and is an ideal place to recruit a high-risk population, such as those women who have sex traded for drugs or money. For example, women who sex trade and have anal sex, and women who sex trade and are homeless are at high risk for infectious disease. In addition, this recruitment allowed us to get a diverse sample of participants from several ethnic groups.

A second strength of the study is that both drug use and psychological factors, including the innovative factor of trait displaced aggression, were included in the study. There is also the delineation of the effect of impulsivity and sex trading behavior. Many factors are associated with sex trading, and this study was able to identify several factors that contribute to the variability in sex trading behavior.

5. Conclusions

This study provides some insight into the behaviors of women who sex trade for drugs only, money only, and both drugs and money. This study may affect how drug treatment counselors, public health workers, and prevention specialists deal with high-risk populations, such as those who sex trade for both drugs and money. In addition, this study could help treatment programs create intervention protocols. Women who sex trade have many obstacles to overcome in order to change their unhealthy behavior, and this study has identified several different factors that are related to sex trading behavior for different groups of sex traders. There is a complex relationship between women who sex trade for drugs, money, and both drugs and money, and further research is needed to fully understand this relationship and its implications.

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Contributors

Authors Fisher and Reynolds designed the study and wrote the protocol. Pedersen contributed knowledge of Displaced Aggression and ANOVA analysis. Clingan conducted the statistical analysis, prepared tables initially for publication, and originally wrote the first draft of the text. Xandre contributed knowledge of sexually transmitted diseases and HIV infection. All authors contributed to and have approved the final manuscript.

Conflict of interest

All authors declare that they have no conflicts of interest.

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