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Estimating the sex buying behavior of adult males in the United States: List experiment and direct question estimates

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ABSTRACT

Purpose: Estimating the size of the sex buyer market in the United States has been stymied by methodological and sampling challenges. Given known methodological issues in self-reporting and the sensitive nature of purchasing sex, current research faces challenges in providing estimates of demand for purchasing sex. This study used a unique approach to estimate the prevalence of sex buying by men over the age of 18 in the United States.

Methods: This study employed a double list experiment and a direct ask question to a nationally representative sample of 2525 adult males to estimate the size of the sex buyer market in the United States.

Results: The double list experiment found the prevalence of sex purchasing is roughly 1 of every 50 adult males in the U.S. (2%) over the 3 years. The direct ask questions found that roughly 1 of every 25 males in the U.S. (4%) had purchased sex in the past 3 years. How they purchased and who they purchased sex from was also explored. A total of 80 respondents reported buying sex during the past 3 years. They spent an average of $120 for their most recent sex-buying encounter. Most sex buyers reported buying sex from an offline venue (street, bar, or massage parlor) and 81% purchased sex from a female. Applying the estimate of sex buying behavior to the general male population in the U.S. results in approximately 4 million men over the age of 18 purchasing sex the past 3 years.

Conclusions: The findings from both the double list experiment and the direct ask question indicate that buying sex is a relatively rare phenomenon among adult males, however, when accounting for multiple purchases and extrapolating to the entire population the estimated purchases is in the millions. Applying the double list experiment and a direct ask question to a nationally representative sample provides a new way to capture estimates while addressing some of the limitations of previous methods. Such findings have implications for both the criminal justice and public health sectors.

1. Introduction

The commercial sex industry describes the profit-driven market of transactional sex and sexual services. Within the industry a variety of direct (e.g. prostitution) and indirect sexual services (e.g. pornography and exotic dancing) transpire (Weitzer, 2012). The acts of selling and purchasing sex are illegal and under certain legal contexts, including the removal of consent through force, fraud or coercion or if a minor is involved in the act, are statutorily defined as sex trafficking crimes (Yu, 2011). Debates about the normative and moral nature of the commercial sex industry are common features of academic research on this issue. Some inquiries characterize buying and selling sex as immoral, illegal and harmful – especially to women – while others argue that it is a personal, reasonable and private choice (see Gerassi, 2015; Moran & Farley, 2019; Wilson & Butler, 2014; Weitzer, 2012). While this exchange provides insight into the motives, perceptions and characteristics of those engaged in purchasing/providing sex, the scope and scale of the United States' sex market has yet to be definitively addressed by researchers. Recognizing that there are very strong and differing perspectives about the nature of exchanging money for sexual services, the purview of this study is narrowly focused on examining market features – specifically the demand for prostitution in the United States (US). This research does not engage the various positions on sex work, nor does it support or refute any specific arguments about the industry. Rather, the

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sole goal is to provide a new methodology in estimating the demand for sexual services that can be utilized by researchers across theoretical and moral paradigms to understand the extent of purchasing behaviors within the commercial sex industry.

Determining how many men within the US acquire services from a person[1] exchanging sex for money and how often they engage in this behavior is a complex endeavor. Sex markets are illegal throughout most of the country, and empirical efforts to understand industry dynamics have largely focused on sex trafficking, victimization and intervention efforts. Further, the tension between opposing views of prostitution - trafficking/slavery at one extreme and a natural right on the opposite - has created barriers to understanding buying/selling sex as a market like any other (Monto, 2004, Monto, 2010; Pinto, 2011; Shively, Kliorys, Wheeler, & Hunt, 2012). Finally, commercial sex studies are often restricted to women who sell sex, though in recent years researchers have begun to explore consumers as well (see Farley, MacLeod, Anderson, & Golding, 2011; Milrod & Monto, 2012; Monto, 2010).

Prior studies of sex buyers (also referred to as "consumers", "purchasers", "solicitors" and "johns") have focused primarily on exploring the characteristics and motives of men who pay for sex. A recent study of sex trafficking in Denver encompassed both official arrest data on purchasers and law enforcement perceptions of the scope of demand for illegal commercial sex (Morris et al., 2012). The report found that sex purchasers were on average, 40 years old and most were white. Other research supports the contention that there are demographic similarities among consumers; most are males, many are married with children, between 30 and 50 years old, purchase at least once a year and come from diverse racial/ethnic backgrounds (Chicago Coalition for the Homeless, 2004; Durschlag & Goswami, 2008; Farley et al., 2011; Kosloski, Bontrager Ryon, & Roe-Sepowitz, 2017; Milrod & Monto, 2012; Monto, 2004; Shively et al., 2012). As noted by Morris et al. (2012) research findings about sex buyers are not robust to methodological deviations. Simply including arrested purchasers, a logical design choice, in their sample negated the relationship between marital status and soliciting sex (Morris et al., 2012).

Research on the sex purchasers relies on specific geographic locations, using convenience samples or discrete moments in time to explore soliciting. For example, the Shapiro Group attempted to estimate how many men were buying sex from 'young' girls from online venues in Georgia. While valuable information was gained from the research, their study did not result in a robust and replicable model (National Academy of Sciences, 2013; Pinto, 2011). Inquiries on the scope of sex buying among adult males, to date, rely exclusively on non-representative samples of the population, producing highly variable–from less than 1% to over 16% - estimates of sex buyers in the US (Monto & Milrod, 2014). Studies conducted in Chicago, Scotland, Las Vegas, Portland and Denver provide diverse descriptions of men who purchase sex, but none utilize a representative sample of solicitors and most operationalize soliciting as purchasing at any point in the past (Durschlag & Goswami, 2008; Farley et al., 2011; Monto & McRee, 2005; Monto & Milrod, 2014; Morris et al., 2012). These studies fall short of generalizability and cannot estimate the number of active sex market consumers, but they have contributed to our collective understanding of purchasing methods, buyer motivations and solicitor characteristics. Building from this foundation, there is a clear directive for innovative approaches to ensure an accurate and generalizable assessment of the prevalence of sex purchasing in the US.

This research employs a new survey approach for determining the number of sex buyers in the US based on a list item experiment and a direct ask question of potential male solicitors. This design, in combination with a representative sample of adult males, produces an accurate and generalizable estimate of the percent of males within the US who have bought sex from a prostitute in the past 3 years. Given changes to online purchasing platforms (e.g. moving from credit cards to Bitcoin) and how purchasers solicit sex (e.g. street, online, etc.), the survey also captures this information among this sample. Being able to refine estimates of sex purchasing prevalence has important implications for research on the commercial sex industry, including the full range of sex work and sex trafficking scholars. Moving beyond the labor versus slavery discussion, the emphasis here is on creating a new technique for understanding the extent of active sex buying in the US and enhancing our knowledge of the commercial sex market.

2. Literature review

To date, research on sex buyers largely focuses on motives for purchasing sex and the demographic background of buyers. In doing so, researchers have discovered that some sex purchasers rationalize their behavior as 'normal', they feel entitled as men to buy sex, they often hold negative views of women, and they are more likely than non-purchasers to harm their sexual partners (Durschlag & Goswami, 2008; Farley et al., 2011; Janson, Durchslag, & Mann, 2013; Milrod & Monto, 2012; Monto, 2004, 2010; Monto & Hotaling, 2001; Shively et al., 2012). Sex buyers use indoor and outdoor methods for soliciting sex. Of individuals that admitted to purchasing sex a total of 63% of Farley et al. (2011) study participants indicated they approached women on the street to purchase sex. Purchasing online is a widely used method as advertisements for escorts and commercial sex are readily available from websites, forums, and social networking sites (Finn & Stalans, 2016; Holt & Blevins, 2007; Milrod & Monto, 2012). Other sex buyers report seeking the encounter in bars, strip clubs, and massage parlors (Farley et al., 2011).

Research on prostitution purchasing behaviors largely comes from data collected at john schools[2] and online discussion boards. These studies reveal important information regarding the motives, attitudes, and practices for purchasing sex, however, they do not reflect the true extent of such practices within the United States. Research from the Urban Institute indicates that these sources are unreliable since they are "only the tip of the iceberg for a largely hidden crime" (Dank et al., 2014, p.8). For this reason, recent attempts to provide more accurate information through survey data have been incorporated into research on demand for prostitution. Using a robust modeling technique, the following section describes a new technique for estimating and validating the number of sex buyers in the United States.

2.1. Methods of estimating purchasing

In a review of 181 studies on commercial sex, Wilcox, Christmann, Rogerson, and Birch (2009) reported significant methodological issues in estimating demand for prostitution. Given that prostitution is largely illegal in the United States, controversial, stigmatizing, and buyers can solicit online and out of public view, estimates of purchasing behavior have been difficult to assess (Monto & Milrod, 2014; Roe-Sepowitz, Bontrager Ryon, Hickle, Gallagher, & Hedberg, 2016; Wilcox et al., 2009). Attempts to fine-tune the methodologies used to produce estimates of sex purchasing behaviors have included the use of large-scale surveys and a capture-recapture approach.

Recent attempts to estimate the prevalence of the sex buyer population have utilized large-scale surveys. Monto and Milrod (2014) relied on the General Social Survey to pull from a nationally representative sample. The General Social Survey asks if respondents if they "have

[1] Prostitute is the most common definition, but sex worker, call girl and escort also describe anyone who performs sexual services for payment.

[2] John Schools are criminal justice sanctions similar to intimate partner violence classes. Participants learn about the dangers of buying sex and the harm to prostituted persons. Classes vary considerably but the goal is to stop further purchasing.

ever paid for sex in their lifetime" and if they "paid for sex in the last year" in addition to general attitudinal questions regarding sex. Monto and Milrod (2014) concluded that roughly 14% of men between 18 and 75 years old, sampled between 2002 and 2010, reported having paid for sex during their lifetime. Additionally, they found that about 1% reported buying sex in the past year.

Surveys especially for sensitive topics of inquiry are prone to underreporting (Brewer, Roberts, Muth, & Potterat, 2008). Relying on capture/recapture techniques, ecological modeling adapted to sociological phenomena, researchers have successfully estimated the number of drug users in London (Hickman et al., 2002). Simply, a sample is observed at time 1 and compared to a similar sample within a geographic region at time 2. The overlap of elements in the two groups is the recapture estimate (Larson, Stevens, & Wardlaw, 1994). Using the same technique, Brewer et al. (2008) were the first to attempt the complex task of creating an estimate of the size of the population of street prostitution customers in the United States using a capture-recapture method. This method used arrest records for prostitution in six cities in the United States and matched them with county data they estimated 2–3% percent of adult male residents in several large metropolitan areas in the United States patronized local street prostitutes (Brewer et al., 2008).

Roe-Sepowitz et al. (2016) used a similar capture-recapture approach to study demand for prostitution online. In *Invisible Offenders: A Study of Online Sex Customers,* Roe-Sepowitz et al. (2016) placed decoy ads on common solicitation websites for illegal commercial sex in 15 metropolitan cities. They then captured potential buyers telephone numbers when responding to the decoy ads. The data was de-identified and was then used for the capture-recapture calculation to create probability estimates of demand size in some metropolitan cities in the United States. They found that 1 out of every 20 males adult males in a metropolitan city area was soliciting online sex ads or that 3% of adult males in these cities were buying sex online. This capture-recapture approach used by Brewer et al. (2008) and Roe-Sepowitz et al. (2016) does require knowing that either a charge has been filed via official law enforcement records or that the intention of someone who contacts the ads is in fact to purchase sex. In using the capture-recapture method online, changes to soliciting website availability (e.g. Backpage.com) has limited the feasibility of this approach at this time. To account for limitations in current methods to assess purchasing prevalence, the current study provides a new strategy for estimating the prevalence of sex buying behavior using a double list experiment and a direct ask question.

3. Methodology

Multiple surveys were created by the authors and resulted in questions including; responses to prevalence of paying for a sexual encounter from a prostituted person, policy attitudes towards prostitution, assessment of opinions about characteristics of prostituted persons and sex buyers, assessment of the participant's understanding of the consequences of prostitution, assessment of the perceived victimization risk and media exposure, gender ideology and moral foundations, religiosity and moral foundation, prior arrest, and characteristics of the participant's last prostitution incident. This study was approved by the Arizona State University Institutional Review Board. This questionnaire was reviewed by a sex trafficking survivor-leader whose feedback was integrated into the survey. The questionnaire took an average of 7 min for the participants to complete. The survey instrument utilized both indirect and direct questions.

3.1. Sample and data collection procedure

To determine the national prevalence of sex purchasing among American men, the Growth from Knowledge or GfK Group (formally Knowledge Networks) was commissioned to administer a survey to a representative sample of 2525 adult (18 or older) men residing in the United States. This targeted sample size was chosen to yield a maximum margin of error of ± 2 percentage points. The GfK Group sampled respondents from its KnowledgePanel. The KnoweldgePanel is a pre-recruited and probability-based online panel, which is representative of the general population (Dillman, Smyth, & Christian, 2014: Tourangeau, Conrad, & Couper, 2013). Panelists were initially recruited into the KnowledgePanel through random sampling of addresses using the United States Postal Service's Delivery Sequence File. To extend coverage to members of the public who are not Internet users, the GfK Group provided individuals who lacked computers and/or Internet access with these facilities when they joined the KnowledgePanel. After joining the panel, panelists periodically receive email invitations to participate in surveys. These surveys are self-administered through the respondents' (or the GfK-provided) computers.

The GfK Group (and KnowledgePanel) is a market leader for probability-based online surveys (Weinberg, Freese, & McElhattan, 2014). Allcott (2011) opines that GfK has developed a superior survey platform that is publicly available to social scientist. The KnowledgePanel has regularly been used by both the Time-Sharing Experiments for the Social Sciences, an ongoing interdisciplinary program funded by the National Science Foundation (NSF), and the American National Election Studies to field general population surveys (Mutz, 2011). Chang and Krosnick (2009, p. 641) demonstrated that probability-based Internet surveys fielded with the KnowledgePanel manifested "the optimal combination of sample composition accuracy and self-report accuracy." They found that KnowledgePanel surveys yielded higher quality data than random telephone questionnaires, containing lower levels of random measurement error, satisficing, and social desirability bias.

The survey was fielded between January 10 and 14, 2017. The target sample size was 2500 participants. GfK sent invitations to participate to a total of 5000 male panelists over the age of 18, and reminder emails were sent to non- responders on the third day of the administration period. A total of 2525 (51% participation) men engaged in the survey. The American Association for Public Opinion Research's *Standard Definitions* (2016, pp. 48–49) provides formulas for calculating the final outcome rates in surveys with pre-recruited, probability-based online panels. Per these calculations, the survey completion rate (COMR), or the rate of response to the survey invitation among eligible panel members, was 50.5% (2525/5000 × 100). The average initial recruitment rate (RECR) into the panel was 12.9%, and the average profile rate (PROR) was 64.9%. In turn, the cumulative response rate (CUMRR = COMR × PROR × RECR) was 4.2%. This CUMRR is typical of response rates administered to pre-recruited probability-based online panels. Meta-analyses have shown that survey response rates are weakly related to nonresponse bias, which varies mostly at the estimate rather than survey-level (Groves, 2006; Groves & Peytcheva, 2008). Krosnick, Presser, Fealing, & Ruggles (2012, p. 6) recent report on survey research methods to the National Science Foundation emphasized this point: "nonresponse bias is rarely notably related to [the] nonresponse rate."

Of the respondents who participated in the survey, 2498 (or 98.9%) answered the indirect questions about purchasing sex, and 2484 (or 98.4%) answered the direct question (see below). For the analyses, the data were weighted to account for respondents' probability of selection, and to adjust for population benchmarks from the Current Population Survey. Table 1 presents both the unweighted and weighted demographic characteristics of the sample.

Of the sample, the unweighted mean age was 50 years old (weighted 47 years), was 72% White, 8.6% Black, and12% Hispanic (weighted 65%, 11%, 16% respectively). A total of 61% of the respondents were married (57% weighted), an overwhelming majority were employed (95% non-weighted; 94% weighted). Most had some education as 27% had a high school degree, 28% had attended some college or had an Associate degree, 21.6% had earned Bachelor's degree, and nearly 16% had a Graduate degree (weighted 30%, 27%, 17%, 13% respectively).

Table 1
Unweighted and weighted descriptive statistics ($N = 2525$).

Variables	Unweighted		Weighted		Range
	Mean or %	SD	Mean or %	SD	
Age	50.22	16.75	47.07	17.39	18–94
White	71.88	–	64.86	–	0–1
Black	8.55	–	11.15	–	0–1
Hispanic	11.76	–	16.19	–	0–1
Education	3.58	1.61	3.27	1.64	1–6
No HS diploma	7.29	–	12.47	–	0–1
HS diploma	27.17	–	30.26	–	0–1
Some college	18.61	–	17.77	–	0–1
Associate's degree	9.54	–	9.40	–	0–1
Bachelor's degree	21.58	–	17.04	–	0–1
Graduate degree	15.80	–	13.06	–	0–1
Income	3.55	1.66	3.53	1.68	1–6
Less $25 K	13.15	–	13.61	–	0–1
$25–49.9 K	19.49	–	19.72	–	0–1
$50–74.9 K	17.15	–	17.82	–	0–1
$75–99.9 K	15.33	–	14.41	–	0–1
$100–149.9 K	18.81	–	17.73	–	0–1
$150 K or more	16.08	–	16.71	–	0–1
Married	61.62	–	57.28	–	0–1
Homeowner	72.44	–	70.12	–	0–1
Unemployed	4.95	–	5.89	–	0–1
Region	–	–	–	–	–
Northeast	18.77	–	17.93	–	0–1
Midwest	22.22	–	21.15	–	0–1
South	34.57	–	37.02	–	0–1
West	24.44	–	23.89	–	0–1

3.2. Survey measures

3.2.1. Indirect questions

In surveys dealing with sensitive topics, indirect questioning techniques are used to reduce under- and over-reporting, as well as item nonresponse, by respondents due to social desirability bias (Tourangeau & Yan, 2007). Many indirect questioning techniques exist, but the list experiment—also known as the item- or unmatched-count technique—is among the most frequently used (Imai, Park, & Greene, 2015). Compared to the list experiment, other indirect questioning techniques (e.g., randomized response technique) tend to result in higher item nonresponse because they are more confusing and burdensome for respondents, and often raise suspicions (Coutts & Jann, 2011; Droitcour et al., 1991; Holbrook & Krosnick, 2010a).

The list experiment involves randomly assigning respondents to answer different versions of a numerical count question, in which they are asked to indicate how many items in a list are applicable to them, but not to indicate which items specifically are applicable (Droitcour et al., 1991). In this way, respondents are granted privacy through aggregation—"as long as the entire list does not apply, the respondent can be assured that the researcher does not know their answer to the sensitive question" (Glynn, 2013, p. 160). The different versions of the count question used in a list experiment must be identical with the exception of the key (sensitive) item—that is, one version *includes* the key item (sensitive behavior) along with several additional items (full list, treatment group), while the other version *excludes* the key item but contains the rest of the items (baseline list, control group). In turn, because of random assignment, the prevalence of the sensitive behavior can be estimated as the difference between the treatment and control groups' average responses to the count question.

There is a growing body of evidence supporting the advantages of the list experiment over direct questioning for asking about sensitive behaviors (Holbrook & Krosnick, 2010b; Rosenfeld, Imai, & Shapiro, 2015; Tsuchiya, Hirai, & Ono, 2007). The main limitation of the list experiment is that while it reduces social desirability bias, it yields estimates with much higher variance (wider confidence intervals) than direct questioning (Rosenfeld et al., 2015). To increase the efficiency (or precision) of the estimator, Droitcour et al. (1991) suggest using two different baseline lists for all respondents, but randomly assigning them to receive the key item appended to only one of the groups. This "double list experiment" reduces sampling variability because all respondents serve double duty, simultaneously functioning as both treatments and controls. To further reduce variance, Glynn (2013) recommended using the double list experiment and designing the two baseline lists so that there are negative within-list correlations between the items, but a positive between-list correlation. Glynn's (2013) technique has the additional advantage of reducing the risk of ceiling effects, which occur when respondents answer affirmatively to all the baseline items, thereby forfeiting any privacy on the key (sensitive) item.

Table 2
Double list experiment: survey questions.

Introduction to each list:
"Here are [four/five] things that some people have done. Please tell us HOW MANY you have done at least once during the past 3 years. We don't want to know which ones you have done. Just tell us HOW MANY in total during the last 3 years."

Baseline list X:

1. Given money to a charity
2. Used marijuana
3. Finished a marathon or half marathon
4. Smoked a pack of cigarettes

Baseline list Y:

1. Flown on an airplane
2. Gotten a tattoo
3. Donated blood
4. Used cocaine, heroin or methamphetamine

Key (sensitive) item:

5. Paid for a sexual encounter from a prostitute

Notes: Within each list, the ordering of the items was randomized for each respondent. As intended, there was a positive correlation between responses to the two lists ($r = 0.287$).

Consistent with these current best practices, the experiment was conducted and followed Glynn's (2013) recommendations for designing the baseline lists. Additionally, given evidence that respondents prefer longer lists, the baseline lists with four items were used (Droitcour et al., 1991). The list experiment was the first question in the survey. Both baseline lists and the key item are shown in Table 2.

Several assumptions underlie the list experiment, which when met strengthen confidence in resultant prevalence estimates (Aronow, Coppock, Crawford, & Green, 2015; Imai, 2011). The first is the "Ignorable Treatment Assignment" assumption, which necessitates that assignment to the treatment and baseline lists is independent of actual behavior and survey responses. The second is the "No Liars" assumption, which holds that respondents who have done the sensitive behavior disclose it in the list experiment. Finally, the "No Design Effects" assumption requires that the inclusion of the key item does not change respondents' answers to the other baseline items. Aronow et al. (2015) developed two placebo tests for assessing the validity of the above assumptions. These tests require that a direct question about the sensitive behavior is included in the questionnaire for all respondents and assume monotonicity (no false *confessions* to direct questions). Typically, researchers include the direct question only for respondents in the control group (receiving the baseline list), or for a separate randomly selected group of respondents who receives only the direct question (and not the list experiment). In order to conduct the placebo tests, however, we followed Aronow et al.'s (2015) recommendation to include a direct question for all respondents (see below).

3.2.2. Direct questions

Later in the questionnaire, several questions after the list

experiment, a direct question about purchasing sex from a prostitute was included, along with several follow-up contingency questions on respondents' most recent experience purchasing sex. Although the questionnaire also included the indirect questioning technique described above to measure sex purchasing, several steps were taken to minimize social desirability bias in responses to the direct questions. Research shows that self-administration is the most important methodology for ensuring accurate responses to sensitive questions (Tourangeau & Yan, 2007). Some evidence suggests that the combination of self- and online-administration may further reduce socially desirable responding in comparison to self-administration with paper questionnaires (Tourangeau et al., 2013). For these reasons, our survey was both self-administered and completed online.

Another strategy for increasing the accuracy of responses to direct questions about sensitive behaviors is to "warm up" respondents by gradually and progressively introducing them to other sensitive questions prior to the key sensitive question (Bradburn, Sudman, & Wansink, 2004; Warwick & Linger, 1975). Accordingly, in this survey, leading up to the direct question about sex purchasing, we included questions about prior vicarious (family and friends) and personal arrest experiences (for any offense), and a question asking about drinking and driving. We assumed these behaviors would be relatively common and thus less threatening for respondents, compared to sex purchasing. Consistent with this assumption, 43% of respondents reported having a family member or friend who had been arrested, 27% reported having been arrested themselves, and 57% reported driving after drinking enough alcohol to feel drunk.

Some researchers also suggest using affirmative wording to load sensitive questions (e.g., presupposing respondents have committed the behavior, and just asking them about the frequency (Bradburn et al., 2004). Consistent with this recommendation, we worded the direct question as follows: "In the past 3 years, how many different times have you PAID for sex from a prostitute?" The response options were: None, Once, 2–3 times, 4–5 times, and 6 or more times. In the analysis, because of low frequencies, we combine the last two response options. Following this question, we included several contingency questions asking about the price of their last encounter in dollars ("Please think about the last time you paid for sex from a prostitute. How much did you pay for the sex act?"), the location of the solicitation ("Where did you find the prostitute? On the street, online, or through some other way?"), and the gender of the prostitute ("Was the prostitute male, female, or transgender?").

4. Results

First the findings from the double list experiment were examined, which are presented in Table 3. The top panel in Table 3 presents the unweighted findings, and the bottom panel presents the weighted findings. For List X, the difference in means between the groups receiving the full and baseline lists is negative (unweighted = −0.028, weighted = −0.020). This can happen in list experiments when the sensitive behavior has a very low prevalence that is outweighed by sampling variability (chance differences between treatment and control groups) (Droitcour et al., 1991, p. 206). For List Y, the difference in means between the groups receiving the full and baseline lists is positive, but small (unweighted = 0.076, weighted = 0.059). To combine the findings from List X and List Y, we use the equations provided by Droticour et al. (Droitcour et al., 1991, p. 189) for calculating the average estimate and variance. We obtain a combined prevalence estimate of approximately 2% (unweighted = 0.024, weighted = 0.020), and a 95% confidence interval with an upper bound around 6% (unweighted = 0.057, weighted = 0.058). Therefore, the overall estimate of the prevalence of sex purchasing derived from the double list experiment is that roughly 1 in every 50 adult American men (or 2%) has paid for sex from a prostitute in the last 3 years.

Next, using responses to the direct question on sex purchasing, the two placebo tests outlined by Aronow et al. (2015) were conducted to assess the assumptions underlying the list experiment. The results are presented in Tables 4 (bottom panel) and 5. The first placebo test jointly tests the monotonicity, no liars and no design effects assumptions. If these assumptions hold, then the confidence interval around the estimate from the double list experiment should include 1 for respondents who admit to purchasing sex in the direct question. The results in the bottom panel of Table 4 show that this is not the case in our survey (mean difference = 0.655, 95% CI = 0.420–0.890), indicating that at least one of these assumptions is violated. The second placebo test assesses the ignorable treatment assignment assumption. If this assumption holds, then answers to the direct question should be statistically independent of treatment assignment (randomization to receive Lists X5 and Y4, versus Lists X4 and Y5). The results in Table 5 suggest that this assumption holds in our study—there is not a statistically significant difference in responses to the direct question across experimental groups.

Given this evidence of truthful responding, we now turn to the findings from the full sample for the direct question. These are presented in Table 6. The top panel in Table 6 presents the unweighted findings, and the bottom panel presents the weighted findings. First, a slightly smaller number of respondents answered the direct question (N = 2484) than responded to the double list experiment (N = 2498). Second, similar to the results from the double list experiment, responses to the direct question indicate that sex purchasing is a low prevalence activity among American men. Specifically, the weighted findings indicate that almost 4% of American men (or 1 in 25) have purchased sex from a prostitute within the past 3 years, with a 95% confidence interval ranging from a low of roughly 3% to a high of about 5%. According to the most recent U.S. Census estimates, there are approximately 118 million adult men in the U.S. Our findings from the direct question would thus suggest that well over 4 million American men have paid for sex from a prostitute in the past 3 years. Third, the evidence indicates that among those men who admit to paying for sex from a prostitute in the past 3 years, most (roughly 57%) say they have done so multiple times.

Table 3
Estimates from double list experiment (N = 2498).

	Full list (5 items)		Baseline list (4 items)		Difference		95% CI	
	Mean	SE	Mean	SE	Mean	SE	Lower	Upper
Unweighted								
List X	1.228	0.031	1.256	0.027	−0.028	0.041	−0.109	0.053
List Y	1.011	0.028	0.935	0.026	0.076	0.039	0.001	0.152
Combined	–	–	–	–	0.024	0.017	−0.009	0.057
Weighted								
List X	1.223	0.038	1.243	0.030	−0.020	0.049	−0.115	0.076
List Y	0.996	0.031	0.937	0.030	0.059	0.044	−0.026	0.145
Combined	–	–	–	–	0.020	0.019	−0.018	0.058

Notes: n^1 = 1191 (full X list, and baseline Y list); n^2 = 1307 (baseline X list, and full Y list). Numbers were rounded after calculations were made.

Table 4
Placebo Test #1: Joint Test of the Monotonicity, No Liars, and No Design Effects Assumptions.

	Full list (5 items)		Baseline list (4 items)		Difference		95% CI	
	Mean	SE	Mean	SE	Mean	SE	Lower	Upper
None								
List X	1.186	0.031	1.243	0.027	−0.056	0.041	−0.138	0.025
List Y	0.982	0.029	0.921	0.026	0.061	0.039	−0.015	0.137
Combined	–	–	–	–	0.002	0.017	−0.031	0.035
At least once								
List X	2.350	0.184	1.667	0.174	0.683	0.253	0.179	1.188
List Y	2.077	0.181	1.450	0.156	0.627	0.239	0.150	1.103
Combined	–	–	–	–	0.655	0.118	0.420	0.890

Notes: Table shows estimates from double list experiment, disaggregated by respondents' answers to the direct question. Numbers were rounded after calculations were made. For this analysis, the data are not weighted.

Interestingly, the prevalence estimate obtained from the direct question (4%, Table 6) is higher than that from the list experiment (2%, Table 3), although the confidence intervals overlap considerably. Several prior studies have also obtained higher prevalence estimates from direct questions than from list experiments (Biemer & Wright, 2005; Droitcour et al., 1991). Holbrook and Krosnick (2010b) found that the list experiment yielded higher prevalence estimates than direct questions in telephone surveys, but not in eight online self-administered surveys. Their findings suggested that "social desirability response bias did not inflate direct self- reports in surveys conducted via the Internet" (p. 56). Recall, our study also involved an online self-administered questionnaire. In our study, there also appears to be little social desirability bias in direct self-reports (top panel, Table 4). Therefore, we believe the lower prevalence estimate obtained from the double list experiment, relative to the direct question, most likely reflects greater measurement error in the former, resulting from the higher cognitive burden imposed on respondents in count questions (see Tsuchiya et al., 2007). For this reason, we have greater confidence in the direct self-reported prevalence estimate.

Finally, we examine responses to the contingency questions asked to respondents who reported purchasing sex in the past 3 years. The results are presented in Table 7. Readers should exercise caution when interpreting these estimates because the sample size is very limited. Only 80 respondents reported paying for sex in the past year, and several of these respondents declined to answer the follow-up questions.

The findings from this sample indicate that the average amount paid for sex in the most recent encounter was approximately $120. Most (66%) men located the prostitute offline (e.g., on the street, at a bar, or in a massage parlor), while roughly 34% found the prostitute online (e.g., through online ads, an escort advertising site, or social media). The vast majority of men (81%) paid for sex from a female prostitute.

Table 6
Estimates from the direct question ($N = 2484$)

	Proportion	SE	95% confidence interval	
			Lower	Upper
Unweighted				
None	0.968	0.004	0.961	0.975
Once	0.012	0.002	0.008	0.016
2–3 times	0.009	0.002	0.005	0.013
4+ times	0.011	0.002	0.007	0.015
Weighted				
None	0.963	0.005	0.955	0.972
Once	0.016	0.003	0.009	0.022
2–3 times	0.010	0.002	0.006	0.014
4+ times	0.011	0.002	0.007	0.015

Notes: Numbers were rounded after calculations were made.
QUESTION: "In the past 3 years, how many different times have you PAID for sex from a prostitute?"

Table 7
Estimates from follow-up contingency questions ($N = 75$–78)

	Mean or proportion	SE	95% confidence interval	
			Lower	Upper
Amount paid	$120	$20	$81	$160
Contacted online	0.338	0.057	0.224	0.452
Female prostitute	0.814	0.049	0.717	0.911

Notes: Numbers were rounded after calculations were made. Data were weighted

5. Discussion

Research estimating the demand for commercial sex are limited (Wilcox et al., 2009). When it comes to understanding purchasing behavior more effort has been spent on the motives of purchasers than the

Table 5
Placebo test #2: ignorable treatment assignment assumption.

Direct responses	Randomly assigned experimental group				Difference		95% CI	
	Lists X_5 and Y_4		Lists X_4 and Y_5					
	Mean	SE	Mean	SE	Mean	SE	Lower	Upper
Binary[a]	0.034	0.005	0.030	0.005	0.004	0.007	−0.010	0.018
Frequency[b]	0.066	0.011	0.060	0.010	0.007	0.015	−0.023	0.036

Notes: Table shows responses to direct question by experimental group assignment for the double list experiment. Numbers were rounded after calculations were made. For this analysis, the data are not weighted.
[a] Variable is coded 0 = none, 1 = at least once.
[b] Variables is coded 0 = none, 1 = once, 2 = 2–3 times, 3 = 4 or more times.

prevalence. Using a nationally representative sample of adult American males, the current study examines the prevalence of buying sex in the United States. Specifically, the evaluation addressed two unique questions related to sex buying: what proportion of adult men purchased sex in the past 3 years and what were the circumstances of the transactions. The findings from both the double list experiment and the direct ask question indicate that buying sex is a relatively rare phenomenon among adult males, with a range of 2–4% depending on how the question was asked.

According to the double list experiment, roughly 2% of adult males paid for sex in the past 3 years. This finding should be interpreted with caution due to sample size, measurement error and violation of a key assumption. Asking participants directly about buying sex produced a much higher number of males who had bought sex in the last 3 years (4%). Based on validity testing, the second estimate of purchasing behaviors is the more valid of the two measures. Extrapolated to the entire adult male population within the United States, this equates to approximately 4 million men who have bought sex in the past 3 years. These prevalence estimates are considerably lower than most survey studies (Monto & Milrod, 2014) but closer to the capture-recapture approach (Brewer et al., 2008). One reason for this may be that prior research varies in the time period included for estimating.

The current study places more emphasis on recent behavior as opposed to long-term buying in an effort to improve our understanding of contemporary sex buying habits. Additionally, while the estimates are lower, when extrapolated to the general adult male population, the scope of the issue – 4 million buyers in the last 3 years – is clearly substantive. When combined with the finding that over half of the admitted buyers purchased more than once within the recent past, the number of total sex buying could easily reach 10 million transactions (though our limited sample does not allow for an exact computation).

Following the direct ask question, respondents indicated that they had purchased sex multiple times in the past 3 years (57%). Most stated that they purchased sex through offline venues and sought sex from a female. As to price, the average amount paid for sex, as indicated by respondents, was $120.00 per encounter. That two thirds of the respondents reported buying sex through offline venues suggestions that even in a digital age, more traditional modes of purchasing still dominate the market and the focus on community interventions. This deviates from current research which tends to find more sex buyers are using indoor methods to purchase, especially the Internet (Finn & Stalans, 2016; Holt & Blevins, 2007; Milrod & Monto, 2012).

6. Conclusion

While limited, the body of research concerning sex trafficking, sex work and prostitution is growing and providing new insights into commercialized sex. Amid increasing national and international debates concerning legalization and decriminalization, the findings of this study are especially relevant. This study demonstrates that respondents were honest about their behavior, and under anonymous research conditions will be truthful about sex buying behavior.

Future research should examine attitudes of both buyers and non-buyers to fully understand their views on paying for sex. Moving beyond prevalence estimates, it is critically important that research turn towards accurate transaction and financial figures. Sample size restrictions limit this study to a simple calculation of 4 million transactions by the average rate ($120) totaling $480,000,000 during the past 3 years. When considering the number of repeat buyers (57% of solicitors) and extrapolating the scope of the market, the sex industry could feasibly produce 10 million transactions and yield a billion dollars in 3 years. Future work exploring fluctuating rates along with transaction information will produce empirical estimates of the true financial value of the sex work industry. Finally, expanding upon this study, researchers should examine the gender preferences of sex purchasers. Our findings show that almost 20% of buyers are interested in same sex encounters. Same sex transactions have yet to gain traction within sex work research even though our findings clearly demonstrate that such a demand exists.

Estimates of the demand for commercial sex are deceptively low in all studies. However, using a nationally representative sample allows for a valid and reliable statistic that can be extrapolated to the entire population. Under this lens, roughly 1 out of every 25 adult males has bought sex in the past 3 years. Fifty-seven percent of buyers admitted to purchasing sex more than once during this timeframe, making this a conservative estimate of sex buying among adult males. While not the focus of the current study, the scope of the industry and the number of men who engage prostitutes for sex demonstrated by this research certainly exceeds the criminal justice, public health, and human service sectors' ability to address the issue in the United States.

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