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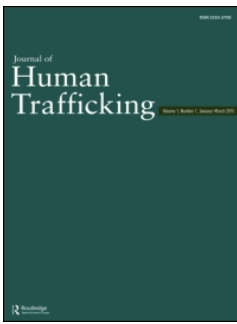**59** PUBLICATIONS   **1,509** CITATIONS

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Invisible Offenders: Estimating Online Sex Customers

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ABSTRACT

Research on prostitution demand has well documented why men buy sex from girls and women, but there is very little understanding of the scope and scale of the issue. The lack of stable and valid measures of how many people buy sex from prostituted persons severely hinders the development of prevention and intervention efforts. This study developed a probability estimate of the population of active customers of online sex in the United States in a sample of 15 cities. In each city, the research team placed decoy online ads, advertising the sale of sexual services/prostitution, and collected text and voicemail data from potential sex purchasers. The resulting 677 phone numbers were analyzed using capture-recapture techniques to create an estimate of the number of online sex purchasers within each city. On average, within the 15 markets explored, 1 out of every 20 males over the age of 18 in a metropolitan city area was soliciting online sex ads. These results demonstrate (a) the viability of new techniques to estimate buyer populations and (b) preliminary figures on the number of purchasers buying sex online.

Sex buyers and the demand side of prostitution have received increased attention from the media, legislators, and activist groups as awareness has grown about sex trafficking and the perils of prostitution. Sex buyers of prostituted persons are rarely punished for their actions and significantly contribute to the victimization of sex-trafficking victims. This lack of accountability has been noted by a large anti-trafficking advocacy movement and has produced an increased awareness of the role of the demand or the buyer of sex in sex trafficking. In some states, the attention has assisted in the implementation of more stringent penalties for customers, specifically those buying sex from minors. Extralegal penalties, such as the public shaming of buyers on billboards and Web sites, have increased along with financial penalties, but little is known about the deterrent effect of these interventions because the scope of the population of sex buyers is currently unknown. Because buyers of sex require anonymity almost as much

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as sexual gratification, they are elusive, complex to research, and, in most cases, hidden in plain sight in our communities. Because of these challenges, they continue to be enigmatic with very little known about how they buy sex, when they buy sex, and where they buy and receive sex services.

Research on prostitution demand has well documented why men buy sex from girls and women (Monto, 2004, 2010; Shively, Kliorys, Wheeler, & Hunt, 2012) but little is known about the impact of prevention efforts, such as stings, shaming Web sites, or reporting the arrest to the media. Much of the gap in the literature is due to the lack of an available baseline number of buyers of sex to determine if these deterrents reduce the number of buyers. Many scholars of the commercial sex industry sex note that valid estimates of purchasers are very difficult to produce because of the nature of the behavior (Empel, 2012; Yen, 2008). Despite the many obstacles to estimation, a few studies have attempted to determine the number of men who purchase sex. These figures are essential to improve our understanding of lifetime and current purchasing behaviors and are critical to creating social policy and law-enforcement actions to systematically address, by city, the demand aspect of sex trafficking and prostitution in the United States.

Prior research on sex purchasing

As noted by Yen (2008), the supply side of the sex trade, legal or illegal, has received scholarly attention; however, demand for sex has not made it into academic discussions or research agendas. While the study does not provide original estimates of sex buyers, it does note that the scant studies on this topic produce wildly different figures on how many men buy sex. Yen reported purchasing rates of males in Great Britain (7%), Thailand (73%), and the United States (16–69%) but cautions against any comparisons and questions the validity of these figures. Empel (2012) echoes these sentiments arguing the hidden nature and/or social acceptance of buying sex makes valid estimates difficult to obtain. However, Empel found that 10–15% of men in developed countries pay for sex.

Previous attempts at estimating the population of sex customers, also called "Johns," have been made in the United States through questionnaires including the General Social Survey (as cited in Monto, 2010; Smith, Marsden, & Hout, 2011) with an estimate that 14% of men surveyed had previously bought sex in their lifetime. Additionally, the National Health and Social Life Survey (as cited in Michael, Gagnon, Laumann, & Kolata, 1994; Monto, 2010) found that 16% of men had visited a prostitute in their lifetime. Unsupported media reports have estimated that between 16% and 80% of men pay for sex (Bennetts, 2011).

The majority of information known about sex customers, particularly men buying sex from women, is based on what is collected from "John Schools," which are court-ordered programs for sex buyers offered in 58 cities and counties in the United States (Monto, 2004; Monto & McRee, 2005; Shively et al., 2012). The "John School" attendees are caught in law-enforcement demand-reduction operations. These efforts are limited in scope and impact and are directly relative to the effort and priority agencies place on the low level, nonviolent crime. Results of a recent study of sex trafficking in the United States found that many law-enforcement agencies do not prioritize sex trafficking as a serious public safety issues (Bontrager Ryon, Keith, & Brown, 2012). Thus, information on purchasing behaviors collected through "John Schools" are unlikely to represent sex-buying customers as a population.

Wilcox, Christmann, Rogerson, and Birch (2009), in their review of 181 research studies on prostitution demand, found there were significant methodological problems with most studies, major gaps in the research, and weak or inconclusive findings on what impacts the demand for commercial sex. Wilcox et al. (2009) also stated that because buying sex in most cultures is stigmatized and out of sight, developing accurate and reliable estimates of the number of people who buy sex has been difficult. In the United States, there are no estimates of the current population of active sex buyers.

The current study

There are a number of challenges to detecting and studying customers of online sex ads, currently the most pervasive method of sex trafficking. Online-sex-ad customers are invisible offenders who are rarely exposed to the public except by episodic targeted enforcement by police (Sanders, 2008). Online-sex-ad

customers experience a lower risk of being caught by police than street-level prostitution customers due to the anonymity inherent in Internet-based solicitation. These risk-mitigating factors include the fact that online-sex-ad customers remain out of (physical) sight of law enforcement while soliciting for sex, the arrangements are made by phone or e-mail, and the sex exchange is done in private in a hotel, brothel, or private home. Whereas street-level prostitution customers make deals and many times commit sex acts in public spaces where they are more likely to receive law-enforcement attention.

The present study examines the number of men who respond to an online decoy ad, using this information to develop valid probability estimates of sex purchasing through online venues. Our research questions are the following:

(1) What is the population estimate for each city of online-sex-ad customers?
(2) What is the rate of demand (online-sex-ad customers) relative to the total exposed population (all males over 18 years old) in each metro city area?
(3) Which of the cities have the highest rates of demand?

By answering these questions we hope to develop new knowledge about customers of online sex ads, information that will greatly assist policy makers and law-enforcement agencies in creating action plans to address the scope of demand for online sex services.

Adding to the generalizable knowledge of sex buyers, this study builds on prior research to provide information that is unique and valuable to responding agencies. The assessment is the only study to provide current estimates of sex buyers in the United States. In addition, it is the only study to use probability techniques to arrive at those estimates. While limited to the online market, the research begins to address the knowledge gaps noted by leading scholars in the field.

Data and methods

Sample

Fifteen cities were included in this study with the goal of having a diversity of metropolitan areas in the United States. Cities on the east coast included Boston, New York City, Baltimore, and Atlantic City. Miami represented the southeastern United States, Chicago, Kansas City, Minneapolis, and Salt Lake City represented the Midwestern United States, and Portland, San Francisco, San Diego, Phoenix, Las Vegas, and Houston covered the west and southwestern United States. In each of these cities, there are multiple in-person and online methods of buying sex. Exploring all available avenues of sex purchasing was not feasible and we limited the study to online venues. The two most popular sex-selling sites were utilized to examine sex-purchasing behavior: craigslist.com (Casual Encounters section) and backpage.com (adult entertainment section, escorts). In all cities, the Craigslist ads were removed for inappropriate content by the company and were therefore removed from the study.

Techniques

Research personnel contacted the law-enforcement unit in charge of vice enforcement in each city to notify them about the study. The decoy ads were sent to them in advance to prevent them from responding to the ad if they were doing enforcement activities during the research period. The research team developed two normative sex ads for the study based on prior work with law-enforcement sting operations and analysis of existing sex ads.[1] Each ad had a unique phone number with a local area code. The ads were placed at 2 pm (local time) on Friday, one week apart. All call and text data were recorded using a Voice Over Internet Protocol (VoIP). The VoIP system collected information from each respondent including time of call, phone number, length of contact, and text and voice messages. See Table 1 for raw data.

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[1]The Arizona State University Institutional Review Board approved this study as to methodological design and ad content.

Table 1. Raw Data Collected in Response to Online Sex Ads.

City	Unique Calls/ Texts	Total Calls for Ads Including Dups (7 days each ad, 2 ads)	Number of Texts	Number of Voicemails	% of Calls Within Local Area Codes
Atlantic City	24	39	15	24	17.90
Baltimore	17	22	6	16	59.10
Boston	23	27	7	20	55
Chicago	20	31	9	23	67.70
Houston	19	31	10	21	74.20
Kansas City	35	70	0	70	88.60
Las Vegas	26	33	17	16	60.60
Miami	26	39	24	15	76.90
Minneapolis	24	27	17	10	85.20
New York City	7	10	3	7	70
Phoenix	62	79	28	51	79.70
Portland	49	79	23	58	54.70
Salt Lake City	48	68	52	16	66.20
San Diego	20	33	16	17	76
San Francisco	18	24	10	14	62.50

This study used a capture/recapture sampling technique, which has been used in ecology and population biology, as well as in demography research. Previous studies using the capture/recapture technique include creating an estimate of the density of a population of animal such as jaguars in Brazil (Soisalo & Cavalcanti, 2006) and tigers in India (Karanth, Kumar, & Nichols, 2002). Sociologists have also used the technique to develop estimates of a problem population such as drug users in London (Hickman et al., 2002), heroin users in Australia (Larson, Stevens, & Wardlaw, 1994), and Type 2 diabetes in the United Kingdom (Ismail, Beeching, Gill, & Bellis, 1999).

An example of this type of sampling is counting how many deer are in a wooded area at a given time. A spotter will be sent to the woods to photograph as many deer as he or she can during a 10-hour period. The photographs are then examined by researchers to identify a unique feature of each deer and a list is created. A short time later, a spotter returns to the woods and photographs as many deer as he or she can in a 10-hour period. Those photographs are compared to the original set and the overlap is counted as a capture-recapture variable. This estimate is the foundation of the formula to determine the size of the deer population.

Using capture-recapture, we matched individuals' phone numbers from two random samples of sex-ad respondents. Using the overlap figure from the two independent samples, we estimate the size of the total population of online-sex-ad purchasers for each city. In this instance, the exposed population includes all males in the metro area over the age of 18 (American Fact Finder, 2011) that appear in multiple samples taken from the same population. Both in this study of online-sex-ad customers and the example of deer in the woods, the overall population is not closed. To minimize issues of attrition and new recruits, we kept the time between collecting samples as short as possible. Ads were placed one week apart, on the same day of the week at the same time of day on the same online venue in each city. We attempted to avoid issues of trap addiction or trap avoidance by placing the identical ads. Although their attempt to purchase sex from the first online sex ad was not completed, this is not unusual and should not impact their decision to attempt a second contact.

Analysis

To estimate the number and percent of online-sex-ad purchasers in each city, we use both the Chapman (1951) analysis and the Cormack (1992) technique. The data provide information on n_1 (number of phone numbers first-ad responses), n_2 (number of phone numbers in response to second ad), and m (the number of phone numbers recaptured). In order to estimate the population we need to either directly estimate N (the total population of online-sex-ad responders) or q (the number of customers not captured on either list).

There are two ways to find N. First is to estimate N directly using a formula by Chapman (1951) for small samples:

$$N = \frac{(n_1 + 1)(n_2 + 1)}{m + 1} - 1, \quad (1)$$

with an associated standard error of the following:

$$SE(N) = \sqrt{\frac{(n_1 + 1)(n_2 + 1)(n_1 - m)(n_2 - m)}{(m + 1)^2 (m + 2)}}. \quad (2)$$

The 95% confidence interval in this case is simply the following:

$$95\%CI(N) = N \pm 1.96SE(N). \quad (3)$$

However, this can sometimes produce very large confidence intervals. Thus, we also used a method introduced by Cormack (1992) that employed a Pearson chi-square algorithm that found a smaller and larger estimate for q that satisfied a p value of less than .05. Thus, two values of N are calculated with these values for q. If no recaptures were found, we were unable to calculate a confidence interval and another method to estimate q, and thus N is fit to a Poisson regression model (Cormack, 1989) on a simple three-row dataset:

$$Y = \begin{matrix} m \\ n_1 - m \\ n_2 - m \end{matrix} \quad X = \begin{matrix} 1 & 1 & 1 \\ 1 & 0 & 1 \\ 0 & 1 & 1 \end{matrix}, \quad (4)$$

where the model is $\exp(Y) = Xb$ and the exponent of the intercept is the estimate value for q. We then use the standard error of this estimate as the standard error for N. For each city, we first tried the Poisson method. If that failed to produce a confidence interval or estimate, we used Chapman's method to estimate N and the chi-square method to estimate the confidence interval. If either of those methods failed, we then used Chapman's standard error to develop the confidence interval.

The exposed populations for this study are all of the males over the age of 18 years old in the metro area of each city. These were determined using American Fact Finder (2011) and used the one-year population estimates of males over age 18 from the American Community Survey from the most recent year available, 2011. This is the basis by which we calculated the percentage estimate of the male population in each city to be online-sex-ad customers. This exposed population is the denominator. The numerator was calculated by multiplying the average number of ads within each city by

		In List B		
		Yes	No	Total
In List A	Yes	m	n_1_m	n_{1+}
	No	$n_2\text{-}m$	q	n_{2+}
	Total	n_{+1}	n_{+2}	N

Chapman's N. For example, in Atlantic City the exposed population was 559,126 males. During the study, there were an average of 206 sex ads posted to the two online venues. This figure is multiplied by 50, the estimate produced from the Chapman N formula. The final estimate of 1.8% of the adult male population purchasing online sex is derived by dividing 10,275 by 559,126. See Table 2 for sex buyer estimations for each city. This model reports the number of active online-sex-ad customers on the first data collection date (mid-June 2013) and considers issues of attrition (customers no longer buying sex from an online-ad source) and new customers (who are entering the market to buy sex online in that city for the first time). These estimates are conservative with consideration of confidence intervals and standard error rates.

Table 2. Estimates of Sex Buyer Population for Each City.

City	% of Males in City Who Call Sex Ads (Confidence Intervals)	Estimated Sex Ad Customer Population	Average # of Ads Posted on Backpage.com in a 24-hr Period (Friday 2pm)
Atlantic City	1.4 (0.5—3.2)*	10,275	206
Baltimore	1.8 (1.0 −2.1)*	17,766	211.5
Boston	7.6 (4.8 −10.3)**	1,30,416	247
Chicago	2.4 (1.4 −3.1)**	83,478	518.5
Houston	21.4 (13.8 −29)**	1,69,920	472
Kansas City	14.5 (9.1 −17.9)**	1,06,624	98
Las Vegas	13.5 (9.1 −19.9)**	99,910	515
Miami	6.6 (4.2 −8.9) **	1,40,184	265.5
Minneapolis	4.9 (3.2–6.7)**	60,120	167
New York City	3.9 (0–7.6)***	21,514	341.5
Phoenix	4.9 (3.4–6.4) **	78,412	307.5
Portland	3.7 (2.6 −4.8)**	31,282	145.5
Salt Lake City	2.6 (0.6-4.7)*	10,675	87.5
San Diego	3.1 (0 −7)*	36,890	310
San Francisco	0.6 (0.1 −1.3)*	9,504	96

*Chapman Confidence Interval. **Chi-Square Confidence Interval. ***Poisson Confidence Interval.

There are a number of study assumptions necessary to consider when interpreting the findings from this evaluation: (a) All men over the age of 18 in each city are potential customers for online sex ads; (b) the ad placed on backpage.com was normative to all of the other ads posted on backpage.com and was not detected as a deceptive ad by potential customers; (c) that the callers (customers) called other sex ads posted on backpage.com during the 24 hours after our ads were posted; (d) that a significant percentage of the customers were from the local area; (e) that the ads were placed on two average Fridays in late spring 2013.

Research findings

Participants

We received a total of 677 contacts from the Backpage.com ads, either texts or calls, from online-sex-ad customers in the 15 cities in response to the two ads. The majority (69.6%) of the contacts were made during the first 24 hours after the ad was posted ranging from 48% in San Francisco to 90% in New York City. There were 677 total responses from 451 unique phone numbers.

Overall, 38% of purchasers sent a text response to the ads and the other 62% placed phone calls. Sixty-six percent of all contacts were from respondents with local area codes, indicating that the market is driven by local demand. Recaptured phone numbers, that is, online-sex-ad customers who called in response to both ads, were found in six cities. One recaptured phone number was found in both Baltimore and Chicago, two were found in Salt Lake City and Atlantic City, and three were found in Portland and Phoenix.

Estimate of population

An estimate was made for the number and percent of online-sex-ad customers in each city. On average, 1 out over every 20 males over the age of 18 in each metropolitan city area was soliciting online sex ads. The findings ranged from one out of every five males (Houston, 21.4%) to less than 1 of 166 males (San Francisco, 0.6%). In Houston, we found that there were an estimated 169,920 males who were soliciting online sex ads, while, in Phoenix, there were 78,412 males who were soliciting online sex ads.

Examining those cities with a calculation of Chapman's N, the results are consistent ranging from a low rate of 1.78 in Baltimore to a high of 4.9 in Phoenix. In cities without a recapture, the estimated

Table 3. Ranking of Cities by Sex Buyer Population.

Rank	City	Percent of Male Population over Age 18 That Are Online-Sex-Ad Customers
1	Houston	21.40
2	Kansas City	14.50
3	Las Vegas	13.50
4	Boston	7.60
5	Miami	6.60
6	Minneapolis	4.90
7	Phoenix	4.90
8	New York City	3.90
9	Portland	3.70
10	San Diego	3.10
11	Salt Lake City	2.60
12	Chicago	2.40
13	Atlantic City	1.80
14	Baltimore	1.80
15	San Francisco	0.60

rate of purchasers varies considerably from a high of 21.4 in Houston to a low of 0.06 in San Francisco. Additionally, the standard error for Chapman estimates is much lower than those produced from the Cormack (1992) algorithm. These results indicate that the Chapman method is a better technique producing consistent estimates with low variability. While the other techniques produce estimates with wide dispersion and higher standard errors. Based on the Chapman N calculations, on average, 2.88% of adult males within each city were purchasing sex online during the study.

In acknowledgement that some of the sex-ad customers may not be from the city where the ad was placed, we conducted analytics of the area codes and differences between texts and voice calls. "Local" area codes ranged between 54.7% (Portland) to 88.6% (Kansas City), except for Atlantic City, which was an outlier at 17.9%. This suggests that in most cities, purchasers buy from their local market and that the market is relatively stable over time. See Table 3 for city rankings for sex buyer populations.

Discussion

The study demonstrates that the number of adult males soliciting sex online varies considerably from one city to the next. This is a key finding for local efforts to combat demand for illegal commercial sex. A clear policy implication is that areas with more purchasers, for example, Houston and Phoenix, should commit more resources to demand-side interventions. Methodologically, the results also differ significantly for those with and without a recapture during the second timeframe. Cities without a recapture utilized the Cormack algorithm, which produced much larger estimates of the purchasing population. This technique is less reliable than Chapman's N, and the results here should be interpreted with caution. Of those cities with a recapture, the average percent of adult males buying sex online was 3% (compared to 6% for all cities).

An important strength of this study is that the method of data collection and analyses can easily be replicated and changes in the estimated population over time or pre-post of an intervention can be calculated. Limitations of this study include that we were only able to gather useable data from one Web site (backpage.com) in 15 metro areas. Additionally, we did not make contact with any of the customers to verify their intent to solicit sex from the posted ad. However, qualitative data from the respondents strongly suggest they were making contact to purchase sex. As previously mentioned, the lack of recapture in nine locations also limits the validity of the estimates in these locations and impacts the generalizability of results to similar cities. Finally, the research is restricted to one illegal commercial sex venue, Internet-based outlets, which represent only one of many

possible markets (brothels, street prostitution, massage parlors, and strip clubs are other known venues). As a result, the study's estimates are certainly conservative, but the current research is unable to determine how much of all sex buying is captured through these techniques.

Even within the context of these limitations, the findings are intended to set a baseline of demand for illegal commercial sex. Without some understanding of the size of this population, we cannot begin to develop interventions, through policy or practice, to address this criminal behavior. The intention of these findings is to inform law enforcement, advocacy groups, and policy makers about the issue and breadth of the nearly invisible problem of online sex customers.

Implications

This study assessed the demand for illegal commercial sex using unobtrusive techniques that protect the identity of potential purchasers. In doing so, it creates the only empirically derived estimates of the number of men actively seeking to purchase sex. These estimates have a functional purpose—establishing some figure of demand—as well as practical implications.

For practitioners and professionals responding to sex trafficking, the study demonstrates the sheer volume of potential purchasers, which averages in the thousands per city. This indicates in a clearly demonstrable and measurable way what is most often described either anecdotally or emotionally—that demand reduction efforts must receive equal attention as targeting traffickers and rescuing victims. For law enforcement, these results compel a review of demand-reduction practices that typically are not a component of their sex-trafficking response.

Practitioners and professionals are also likely unprepared to deal with demand on the scale implicated by this study. While the research only taps into potential purchasers, if even 10% of the respondents actually buy sex, there is a corresponding number of victims. For instance, if 10% of the lowest range of demand becomes realized as an act of sex trafficking, local communities such as Atlantic City, New Jersey, would have over 1,000 victims. These victims would require a diverse range of services and interventions that would likely test the service community's capacity to respond in a meaningful way.

Additionally, given the volume described in this study, it is clear law-enforcement and prosecutorial agencies would soon be overwhelmed with work should they target demand from a strictly prohibitive and punitive perspective. The findings of this study strongly imply that a more holistic approach is necessary to change purchasing behaviors. This includes programs to educate potential purchasers on the consequences of their actions and public awareness campaigns to involve the public in combatting demand. Finally, communities must engage their leaders in a dialogue that says demand, long excused as "boys will be boys," is a community safety issue that will not be tolerated any longer.

Funding

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