10 Prostitution, technology, and the law: new data and directions*
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1 INTRODUCTION

While variously encouraged, sanctioned, prohibited, and taxed in different societies under different legal and regulatory systems, prostitution has continuously played an important role in family phenomena for most of human history. For men, prostitutes may be either economic substitutes or complements for wives in consumption (Posner, 1992), and their availability can also affect wives' position in pre- and post-marital bargaining (Garofalo, 2002). For women, prostitution is a substitute for marriage in production (Edlund and Korn, 2002), and its prevalence can thus affect the rate of family formation and out-of-wedlock childbirth. For society, prostitution potentially has substantial externalities, and in most societies, laws have imposed various regulations on transactions between prostitutes, customers, and others involved in the industry.[1]

Despite the importance of the phenomenon, economic analysis of sex work is in its infancy. There have been some theoretical advances, but a fuller understanding of the phenomenon of prostitution has been stymied by a dearth of systematic data collection. Moreover, the extant empirical literature on the economics of prostitution has primarily focused on either developing countries or, in some cases, outdoor (e.g., streetwalking) prostitution in first-world nations.[2] Our focus in this chapter is on modern prostitution, the institutions of which have changed substantially in the last decade due to the introduction of modern technology, including mobile telephones and the Internet. These technologies have facilitated a substantial indoor market for sex in developed countries, in which customers search online for prostitutes, who in turn screen clients before an assignation takes place and money changes hands.

In this chapter, we begin by outlining the major institutions involved in this market, then turn our attention to several rich new data sources useful for studying modern indoor prostitution, illustrating the value of each with a brief empirical exercise.

[1] For an overview of the case for legalization, see Nussbaum (1999); Dworkin (1993) and O'Connell Davidson (2002) argue in favor of prohibition.

[2] Economic studies of prostitution in developing countries include Ahlburg and Jensen (1998), Rao et al. (2003), Gertler et al. (2005), Arunachalam and Shah (2008) and Robinson and Yeh (2009). Studies of outdoor workers in developed countries generally use less formal research techniques, including case studies, local area analyses, and ethnographic interviews; e.g., see Weidner (2001), Raymond and Hughes (2001). Other analyses of outdoor prostitution in developed countries include Reynolds (1986) and Levitt and Venkatesh (2007).

First, we show that available law enforcement data are primarily limited to studying outdoor workers. We then describe and analyze a large dataset collected from a website where customers review sex workers and provide a vast amount of detailed information about services offered, physical characteristics, business practices, and prices. We illustrate the value of these data to researchers with a hedonic exercise valuing various prostitute characteristics. We also show how these data can provide disaggregated information by year and region, which researchers may match with similarly disaggregated economic, social, and law enforcement data.

Next, we explore the value of data on prostitution advertisements posted on popular websites such as Backpage.com and Craigslist.org. These ads have recently raised a number of important legal questions, including the culpability of hosting sites when users engage in prohibited activities there. We show that these data can be used to illustrate highly localized, high-frequency variation in quantities, prices, and characteristics of prostitutes, which can then be used to test the effects of market interventions, such as Craigslist's implementation of posting charges and identification requirements on prostitution ads in November, 2008. To illustrate the potential value of such data, we perform just such a test.

Finally, we explore the use of direct surveys of sex workers. We show that these can provide detailed information about characteristics and practices that are otherwise unobservable. We illustrate the value of surveys by estimating family and marital status characteristics and key business practices among technology-facilitated sex workers, using a new survey we implemented in 2008–2009.

We conclude this chapter with a call for further research on prostitution in developed countries employing these rich data sources.

2. INSTITUTIONS IN MODERN PROSTITUTION

Both outdoor and indoor prostitution have long histories in the United States and other countries. In this section, we describe the basic institutions associated with prostitution markets in developed countries, and discuss how technology may have affected these institutions. Our analysis is informed by extensive perusal of the various data sources we describe in this chapter, as well as previous literature. In addition, we undertook a number of informative ethnographic interviews of indoor sex workers.

2.1 Legality

In most locations in the United States, exchanging money or other valuable goods for sex is, and always has been, illegal. The statutory exceptions are certain rural counties in Nevada, where brothels are legal, and Rhode Island, where, since 2003, there has been no prohibition on indoor prostitution itself, although advertisement of prostitution services, solicitation of clients, street prostitution and brothel operations are illegal (Arditi, 2009). In other developed countries, such as Germany and New Zealand, prostitution is frequently tolerated, but heavily regulated, especially with respect to allowable means of advertisement.

Despite statutory similarities within the United States, there appears to be wide

variation both across and within cities in the degree to which law enforcement agencies enforce and prosecute prostitution activity. Reynolds (1986) discusses a variety of policy responses used by US police departments in the 1980s. In cities with overburdened police forces, or in cities in which the economic well-being of the city is critically tied to adult tourism and entertainment (e.g., San Francisco and Las Vegas), the police and city officials may adopt a "laissez faire" model in which prostitution is tacitly allowed to operate with little interference. In other cities, by contrast, regulation involves an aggressive enforcement of prostitution laws, usually as a consequence of community standards and concerns regarding nuisance from streetwalkers. Reynolds calls this the "Control" model of police response.

Many other cities lie on a continuum between these endpoints, including those where zoning laws effective create "red light" districts, such as New Orleans' French Quarter or Los Angeles's Sunset Strip.[3]

As we argue below, the arrival of new technologies has changed the market for prostitution, and widened the relatively unpoliced indoor sector. Just how police will respond to these changes is an open question.[4]

2.2   Vertical Integration

The provision of prostitution services involves substantial costs, both pecuniary and non-pecuniary. No doubt this is why in the General Social Survey, only around 2% of American women admit to having engaged in prostitution at any point in their lives (Smith, 2006), despite the very high wages typically available (see Section 4 for evidence on modern prostitute wages, and see Edlund and Korn (2002) for a review of complementary historical evidence).

Offering sex for compensation, especially repeatedly, exposes the prostitute to a heightened probability of sexually transmitted infection (STI) (Farley et al., 1990; Rolfs et al., 1990; Philipson and Posner, 1993; Baseman et. al. 1999),[5] and may lead to severe psychological and emotional harm (Brooks, 2006; Roberts, 2007). While the availability of birth control has reduced the likelihood of unwanted pregnancy, it has not fully eliminated it, and effective forms of birth control are costly. Moreover, prostitutes face the potential for arrest and imprisonment, and a substantial risk of violence from customers and others (Brewer et al., 2006). If discovered by friends and family, prostitutes suffer social stigma and reduced social capital (Rasmusen, 1996; Giusta et al., 2009), including the lower marriage market opportunities that Edlund and Korn (2002) identify as a crucial opportunity cost driving wages.

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[3]   Through this type of segregation, cities attempt to address public nuisance externalities by concentrating prostitution activities apart from most residents. This approach to policing may be an active decision, or else simply the consequence of an inherent tendency for prostitution markets to spatially concentrate (see Freeman et al., 1996).

[4]   See Murphy and Venkatesh (2006) and Bernstein (2007) for evidence of police activities purposefully dislocating street prostitution into the off-street sector.

[5]   Most research on the link between prostitution and STIs has found drug use and prostitution, combined, to be the crucial mechanism driving risky sexual behavior and STI transmission (Flom et al., 2001).

While many of these costs are unavoidable, the industrial organization of the prostitution market may be usefully modeled as an attempt to minimize three specific costs: advertising, personal security, and reputation-building. Like all businesses, prostitutes must advertise to potential clients; however, their efforts to do so are complicated by the fact that, to be useful, advertisements must attract customer attention, but not law enforcement. Moreover, like other firms, security must be provided to deter theft, robbery, and other violence from customers and rivals; however, because prostitution is illegal, sex workers cannot fully rely on the police, who ordinarily supply such security (Brents and Hausbeck, 2005). Finally, since prostitutes cannot advertise openly or maintain a prominent retail location, difficulty in building a reputation for quality service (e.g., not robbing customers or conveying diseases) limits the prices even high-quality prostitutes can charge, since they are difficult to distinguish from low-quality sellers (Cunningham and Kendall, 2009b).

Prostitutes choose a level of vertical integration in which they either perform these activities on their own, or purchase them in the market, and the degree of integration varies among workers and across geographic markets. In a typical vertical arrangement, the prostitute delegates (at some cost) the advertisement, security, and reputation aspects of the business to another individual, such as a pimp, a madam, or the owner of an escort agency or brothel. These individuals attempt to discretely attract customers, facilitate payment, deter potentially violent customers, and avoid arrest. At the other end of the spectrum are vertically disintegrated "independent" prostitutes, who provide all of these services on their own.

For independent outdoor workers, advertisement generally means physical presence on street corners, suggestive clothing, and eye contact with customers (Reynolds, 1986). A potential customer, who typically arrives by car, attracts the attention of the prostitute, who may be standing on the street, sitting in her own car, or visible in the window of a building. The prostitute makes verbal contact with the customer, and if both parties are amenable, the prostitute enters the client's car, and the two then seek an assignation location (which may be the car itself) (Weitzer, 2005).

Since open bargaining on the street is likely to attract unwanted attention from police, the initial contact between a customer and an independent prostitute is usually brief (Barnard, 1993). This fact implies that outdoor independent workers face substantial difficulties in examining and screening potential clients, which in turn raises the likelihood of attracting customers who are violent, under the influence of drugs, or otherwise undesirable.[6]

Outdoor workers may attempt to build reputation by appearing frequently at the same location and at the same time of day. Customers who have received quality service in the past can then locate the prostitute again, and will be willing to pay a higher price. However, maintaining such a public presence is difficult, as it raises the likelihood of police attention and arrest. Hence, most independent outdoor workers do not remain in

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[6] Some screening does occur, however. Upon entry into a client's car, streetwalkers commonly request that the client touch them on the breast or thigh, a practice intended to screen out police officers, who may face regulations against sexual contact with prostitutes (Kuhns, 2008). This of course does not help to screen out violent clients.

the same location for long, instead choosing to "stroll" down busy streets, while turning to catch the gaze of potential customers driving by (Sanders, 2004).

All of these factors raise the relative value of vertical integration for outdoor sex workers. Pimps, who are typically male, can screen potential clients more carefully without giving onlookers the obvious appearance of engaging in prostitution. They can also deter violence through physical intimidation and retaliation against misogynist customers. Since a single pimp frequently manages multiple prostitutes, he can take advantage of economies of scale in advertisement and reputation-building, and is less likely to be an obvious target for police if he remains at the same location over time. While pimps themselves frequently are violent and exploitative towards the prostitutes they work with (Williamson and Cluse Tolar, 2002), some evidence suggests that the level of violence from pimps is lower than the violence prostitutes without pimps face from customers and police (Levitt and Venkatesh, 2007; Block, 2008).

Like outdoor workers, indoor sex workers also vertically integrate to varying degrees. Escort agencies, massage parlors, and other vertical arrangements are common. In an escort agency, several prostitutes (commonly between three and ten) work with an agency manager, who generally performs all advertising (although experienced prostitutes may bargain in joining an agency by offering a stable of client "regulars"). Although escorts are rarely advertised explicitly as prostitutes, almost all escorts offer sexual services (although they may also offer companionship and other services).

In a prostitution-oriented massage parlor, several prostitutes work at a retail location owned by a parlor proprietor. Customers typically pay an entry fee, and are assigned (or may choose) to a worker. The worker begins performing an ordinary massage, but at some point either the client or the worker broaches the subject of sexual services, and bargaining takes place. Massage parlors offering prostitution are frequently operated and staffed by foreign women, especially from East Asian countries (Weitzer, 2005, fn. 2). Before use of the Internet was widespread, agencies and massage parlors advertised in telephone directories, the sports sections of local newspapers, and in the classified ads sections of alternative weekly newspapers, using the legal cover of companionship or massage to avoid unwanted police attention.

Most agencies and massage parlors also screen clients to exclude law enforcement agents and potentially violent or undesirable customers. A potential client who calls an agency, for instance, may be required to offer proof of identification, including, for example, a driver's license or work telephone number, before being allowed to meet an escort in person (see Brooks, 2009 for a detailed description of these methods). Agencies and parlors also sometimes offer physical protection services. For instance, agencies often employ drivers who accompany escorts to the assignation site and are available on-call if assistance is required. Massage parlors may similarly employ a "bouncer". Managers may also provide payoffs to police or elements of organized crime to ensure the safety of workers.

These services come at a high price. While experienced prostitutes who join an escort agency may take home a larger portion of their earnings, it is common for many agency escorts to receive less than 50% of their fees. This suggests that self-provision of these services involves non-trivial costs to independent escorts.

2.3   Effects of Technology

We argue that the rise of home Internet access and other technological advances have lowered the relative cost of advertisements and security, especially for indoor sex workers, and likely have expanded the prostitution market and shifted it towards indoor work.

The Internet facilitates advertisement by indoor workers by allowing them to set up, at low cost, their own websites where they may provide photos and information about rates and availability. The amount of information that can be published is substantially higher than what is possible during a brief encounter on the street or in pre-Internet media such as newspaper classifieds. While setting up and designing a website obviously requires some computer savvy on the part of the worker or agency manager, there are several services that provide web hosting specifically for escorts, and common templates that facilitate web design. In addition, there are a number of websites that offer classified advertisements for prostitution, including Eros.com, Cityvibe.com, and the "adult services" section of Craigslist.org (formerly known as "erotic services"). The latter of these was recently described in a lawsuit by a prominent law enforcement agency as "the single largest source of prostitution in the nation" (Walberg, 2009).

The Internet also facilitates client screening among indoor workers, especially independent workers. Workers can use search engines to locate information about potential clients and to run background checks. A number of companies (e.g., Room Service 2000; see http://www.roomservice2000.com/) provide background checks for clients. A potential customer can pay a fee to one of these companies to have a background check run; then, when the client contacts a sex worker, he can provide access to his anonymized background check. This arrangement allows workers to screen out police officers and others, while clients avoid blackmail from prostitutes, which might be possible if the prostitute had their personal information. In addition, the ease of communication on the Internet allows workers to screen clients through the use of references, by which a worker will only see a client if the client can provide a reference to another worker with a prominent Internet presence. The worker can then contact the referrer and confirm the potential client's suitability. Finally, many indoor workers use the Internet to communicate with potential clients for a time before meeting them in an attempt to ascertain the client's character and screen out those with suspicious tendencies.

The Internet has also facilitated reputation-building, especially among independent indoor workers. A number of websites offer customer reviews for sex workers, in the same way as book reviews appear on Amazon.com or hotel reviews appear on tripadvisor.com. We describe in further detail the largest of these sites, TheEroticReview.com, in Section 4. These sites allow clients to quickly access and compare detailed information on physical characteristics, business practices, and quality of service for a large number of sex workers local to their area. As we discuss in Section 4, reviewing websites appears to be very important in building reputation, with workers exerting substantial effort to maintain high reviews on these sites.

Advertisement and reviewing websites also facilitate improved client/prostitute matching in the indoor market segment generally. In comparison with outdoor matching, in which clients and workers must size each other up within a matter of minutes, the Internet facilitates extensive comparison shopping. Some market participants suggest that these sites have led to better matches such that clients are able to find workers who satisfy

their unique preferences in ways not possible in an outdoor context. For example, one interviewee noted

> I remember years ago, it was common for people to say that they never kissed their clients. Kissing was considered taboo. But today, it is much more common to kiss clients on the mouth. Nowadays, it is much more common for prostitutes to admit to having orgasms with their clients, whereas such a thing seemed to me very rare from even ten years ago.

We believe that these technological innovations have likely expanded the market and caused a shift towards indoor work. As another interviewee noted:

> Provider: It [the Internet] makes everything easy. Everything is quick and fast and it's just simple with it. You can get your name spread all over the place very quickly, for instance.

> Interviewer: So if you didn't have the Internet you wouldn't have known exactly how to broadcast yourself to other people?

> Provider: No, I would have probably thought if I would have chosen to do that, I would have had to go downtown, or something.

> Interviewer: Would you have done that, do you think?

> Provider: No.

Cunningham and Kendall (2009a) provide some empirical support for the role of the Internet in shrinking the street sector.
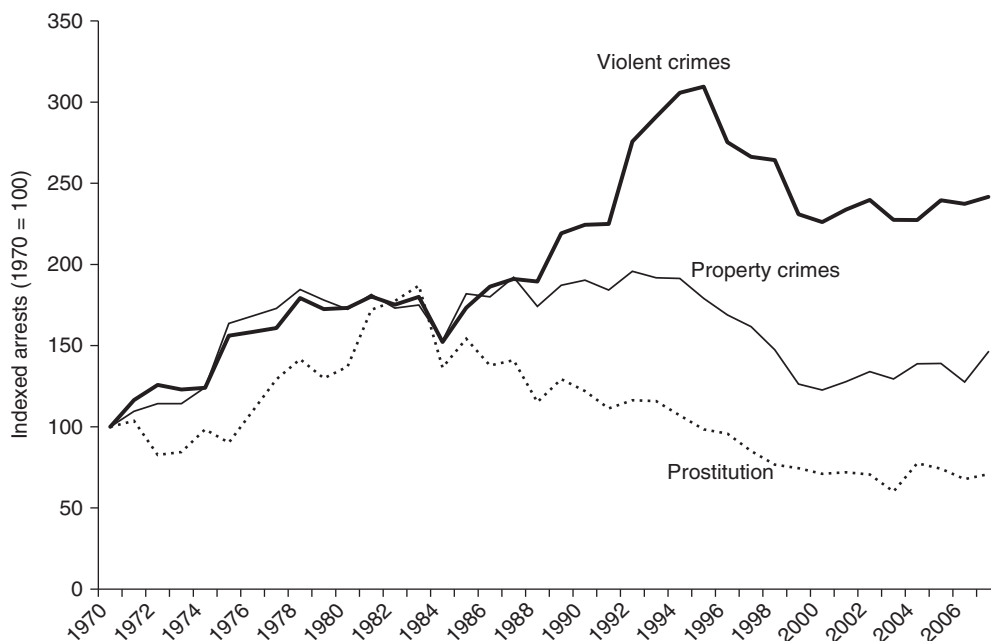
3   LAW ENFORCEMENT DATA

The most widely used data on crime in the United States is the FBI's *Uniform Crime Reports* (UCR). UCR provides official data on crimes reported to law enforcement agencies and arrests made by those agencies, who then report these on a voluntary basis to the FBI. The UCR program divides crimes into two categories. Part I crimes include homicide, robbery, rape, assault, burglary, larceny, motor vehicle theft and arson. Prostitution, by contrast, is a "Part II" crime, for which only arrests are recorded in UCR, not actual crimes committed. Arrests supply, at best, a limited view of crime, since the number of arrests is also a function of police resources applied to any particular crime (Levitt and Miles, 2006).

The FBI defines prostitution as "the unlawful promotion of or participation in sexual activities for profit," and includes in its counts not only those arrested for prostituting themselves, but also keepers of houses of prostitution, panders, and pimps (FBI, 2004).[7] In order to narrow our focus to prostitutes themselves, as far as is possible, we focus on female arrests exclusively.

Figure 10.1 displays the national trend in female prostitution arrests from UCR, and for comparison, similar trends for female property and violent crime arrests. During the

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[7]   Those arrested for attempted prostitution are included as well.

Figure 10.1   Trends in female arrests for prostitution, violent crime and property crime, 1970–2004

late 1970s and early 1980s, the prostitution arrest rate grew substantially, reaching a peak of 70 arrests per 100,000 women in 1983. While property and violent crime arrests rose by a similar percentage during this period, prostitution arrest rates began declining after 1983, while arrests for other crimes continued to rise until the early 1990s. Ethnographic studies, such as Ratner (1992) and Miller (1995), document the common occurrence of female addicts exchanging sex directly for crack with dealers and other men in their communities. Surprisingly, as Figure 10.1 shows, prostitution arrest rates declined in most years during the peak years of the crack epidemic, 1984–91; however, this may be due to the hierarchical structure of UCR data, in which those arrested for multiple crimes (e.g., prostitution and drug possession) are recorded in the data only by the most serious crime (drug possession, in this example). To the extent drugs and prostitution became more closely linked after 1983, UCR data may be limited in accurately describing trends in prostitution activity. Nevertheless, by 2007, prostitution arrest rates were lower than their 1970 value, at 26 per 100,000 women.

UCR data also provide some evidence on the changing characteristics of arrested prostitutes. Figure 10.2 shows the age distribution of female prostitution arrests in 1995 and in 2006, and illustrates a dramatic trend towards bimodalism in the data.[8] As we will

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8   Comparisons with age distributions for other crimes show no such trend of similar magnitude.
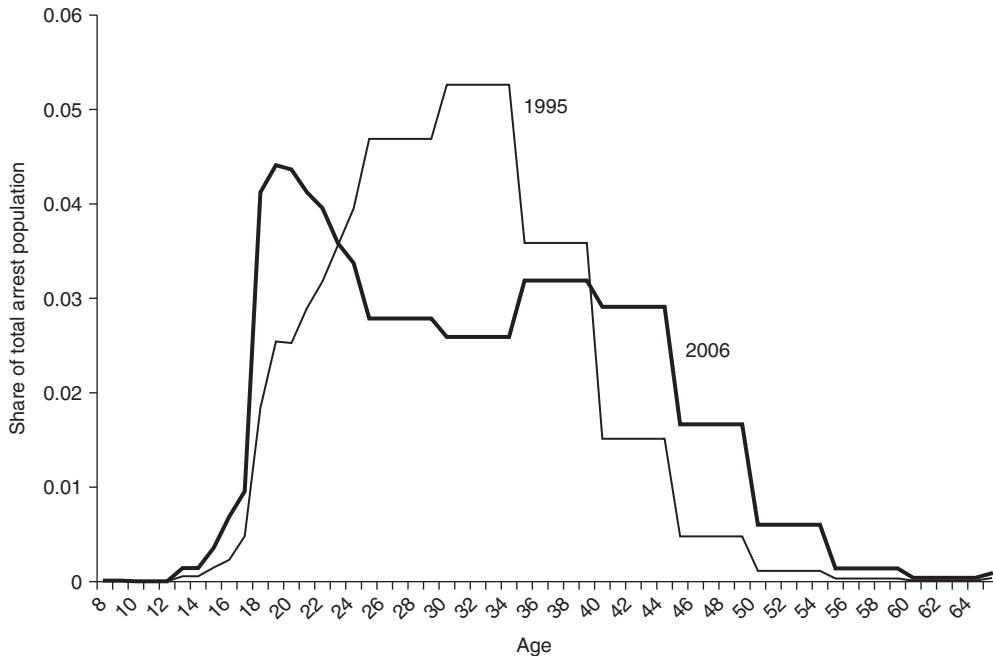
Source: FBI, *Crime in the United States*, various years.

Figure 10.2   Age distribution of prostitution arrests, 1995 and 2006

show below, most arrested prostitutes are outdoor workers; hence, one possibility, which we explore in further detail in Cunningham and Kendall (2009a), is that the Internet and other modern technologies are drawing prime-aged prostitutes into indoor work, where they rarely encounter law enforcement. Those remaining on the street include very young and inexperienced sex workers, and older workers who lack the human and social capital necessary to convert to indoor work.

A related dataset on prostitution collected by law enforcement is the National Incident-based Reporting System (NIBRS). NIBRS has several notable advantages over the summary UCR.[9] Whereas the UCR records one offense per incident as determined by a "hierarchy rule," which results in the suppression of counts of lesser offenses in multiple-offense incidents, NIBRS allows law enforcement agencies to record multiple offenses for a single criminal incident, as well as multiple offenders.[10] Furthermore, information

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[9]   According to Rantala and Edwards (2000), UCR "pales next to the capabilities and potential of the National Incident-Based Reporting System (NIBRS)."

[10]   Other differences abound. For instance, UCR does not distinguish between attempted and completed crimes, whereas NIBRS does. The summary UCR applies the "hotel rule" only to burglary, but NIBRS extends it to include rental storage facilities, as well. The Summary UCR records female rape only. NIBRS records male and female rape. Summary UCR collects weapon information for murder, robbery and aggravated assault, whereas NIBRS collects weapon information for all violent offenses. And finally, UCR provides counts on arrests for the eight index crimes plus

about the offender and the location of the incident are available in the NIBRS but unavailable in UCR.

Unlike UCR, however, NIBRS covers only a limited set of localities. Currently, only 32 states participate, and many of the states with the largest prostitution markets, including California, New York, and Washington, DC, do not participate. Moreover, even among participating states, not all police agencies are included. NIBRS does not currently include any participating cities with populations above one million.[11] As its coverage grows, NIBRS will become a better source of information on prostitution markets.

The instructions for reporting law enforcement agencies in NIBRS indicate that prostitution offenses are intended to focus exclusively on incidents associated with prostitutes, not clients of prostitutes. However, we strongly suspect that these instructions are not fully understood by local agencies, given the surprisingly high number of male offenders in the data. We suspect that these include some combination of male prostitutes and male clients of female prostitutes. Hence, we focus exclusively on female offenders in our analyses of NIBRS in order to narrow our focus to suppliers as far as possible.[12]

Despite its limitations, one of the key benefits of NIBRS is its detailed information about the specific offense, including the location of the incident. Specifically, we created a dichotomous variable indicating whether the offender was caught operating in a "street" area.[13] The share of all prostitutes soliciting from a street declined from a high of 84.5% in 1999 to 74.5% in 2003, before rising to 75.4 in 2005 (see Figure 10.3). Thus, NIBRS data suggests that streetwalkers are still the majority of prostitutes who come into contact with law enforcement – and thus, likely the majority of arrests in UCR data as well – though there is some evidence this share may be declining, potentially due to increased levels of indoor sex work.

4   DATA FROM AN ONLINE SEX WORKER REVIEW WEBSITE

4.1   Data Description

Most empirical work on prostitution has focused on the streetwalker population, yet sociologists believe this actually represents the *least* prevalent share of the entire prostitution underground economy. Weitzer (2005) writes, "[t]he irony is that *most research has been done on the least prevalent type of prostitution*. All too often overlooked is the large population of indoor workers: escort, brothel, bar, and massage parlor" (emphasis

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21 additional offenses. NIBRS provides details on arrests for both the eight index crimes plus 49 other offenses. Other differences can be found in Rantala and Edwards (2000).

[11]   The largest cities participating in 2005 were Nashville, TN and Austin, TX.

[12]   In our analyses, we primarily employ the "offense" and "offender" files from NIBRS. Because we are interested in the characteristics of offenders, we merged the offense file with the offender file, assigning all offenses associated with a criminal incident to the set of offenders associated with that incident.

[13]   Included in this category was anyone arrested in the following locations: transportation terminals, construction sites, convenience stores, grocery/supermarkets, highways, roads, alleys, liquor stores, parking lots, garages, and gas stations.
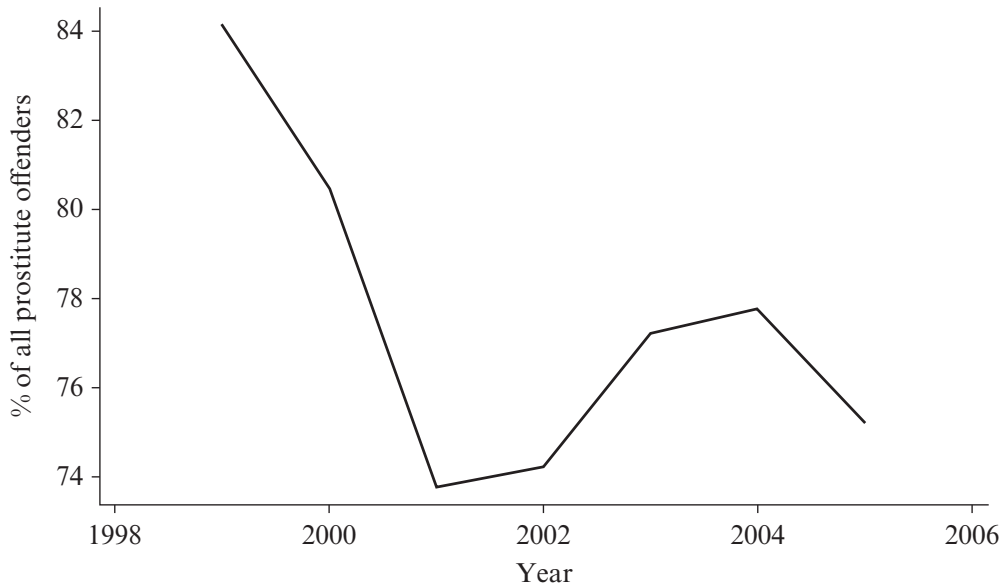
Figure 10.3   Share of prostitution arrests at "street" locations, 1999–2005 (NIBRS)

added). As the previous section showed, the vast majority of prostitutes who come into contact with police are outdoor workers, which may explain why the academic literature has disproportionately focused on that segment. It has been, until recently, far easier to study the streetwalker segment than the indoor segment, since the indoor segment is far more clandestine, with a lower risk of arrest and detection overall.

The previous section showed that the vast majority of prostitutes who come into contact with police are outdoor workers. In this section, we analyze what we believe are the largest and most detailed data currently available on technology-facilitated sex workers.[14] The data are drawn from a website known as TheEroticReview.com ("TER"), where clients share reports and reviews of sex workers they have met. TER was founded in 1998, and the number of individuals reviewed, as well as the number of reviews, has grown substantially over the last decade as the use of the Internet for advertisement by sex workers has grown. Figure 10.4 shows, in logarithmic scale, growth in the site's popularity. While there exist other, similar, websites offering customer reviews on sex workers, TER is by far the largest.[15] As of August, 2008, when we retrieved the data using a PERL script, there were over 500,000 reviews of more than 94,000 sex workers on the site.

Moreover, unlike some other similar sites, TER is national in scope.[16] To illustrate the

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[14]   Data from other, similar sites are analyzed by Moffatt and Peters (2004), Logan and Shah (2009), and Edlund et al. (2009).

[15]   Some others are BigDoggie.net and myRedbook.com.

[16]   A number of cities outside North America, particularly in Europe, also show a substantial number of reviews on the site.
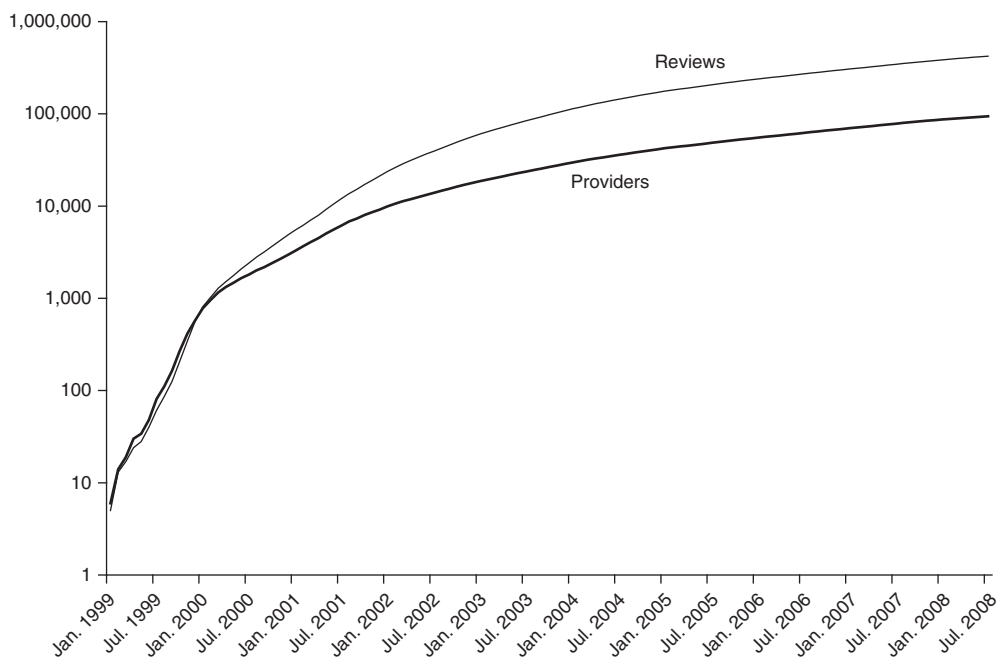
Figure 10.4   *Cumulative number of workers reviewed and total reviews on TheEroticReview. com, 1999–2008*

geographic variation in the relative popularity of the site, we selected a subset of US cities from the pre-specified set of locations over which TER organizes its reviews.[17] Figures 10.5 and 10.6 plot each city's share of all reviews on the site (among the included subset of cities) against that city's (metropolitan area) share of the total population of all cities in the subset. If TER were equally popular on a per-capita basis across all locations, cities would line up along the 45-degree line in this figure. In fact, however, while the site is national in scope, there is some variation in the relative per-capita popularity of the site in different cities. This may be due to differences in city characteristics, including factors driving prostitution demand, statutory and enforcement differences between cities, or the popularity of other competing sites in some cities. Las Vegas, San Francisco, and Washington, DC, cities known to have very active prostitution markets, are all above the 45-degree line, as is Los Angeles, the city where TER was founded.

After an assignation, a customer may fill out an online review form at TER which demands very detailed information on physical characteristics, prices, and services offered, as well as ratings (on a ten-point scale) of the worker's overall appearance and "performance". All workers reviewed on TER must have an Internet "presence" – for

[17]   We excluded non-US cities, as well as regions such as the "Carolinas" or "New Jersey".
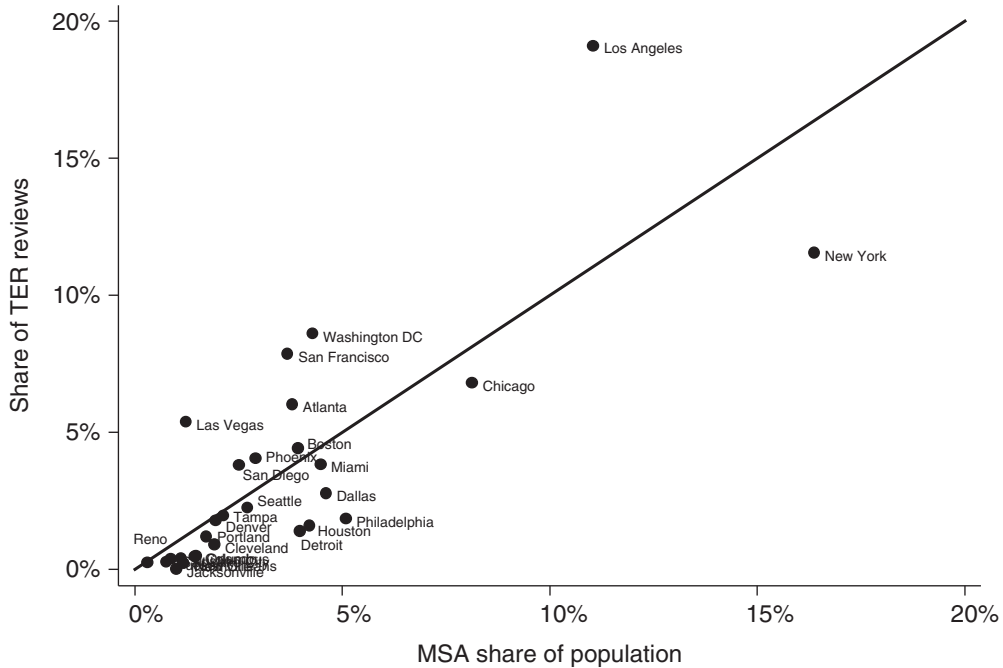
Notes: Vertical axis plots cumulative number of reviews, across all dates, posted on TER for providers listing the specified primary city, as a share of all reviews from US cities. Horizontal axis plots each city's share of the total population of all US cities included in TER, as measured by the relevant metropolitan statistical area.

Figure 10.5   Relative popularity of TheEroticReview.com relative to MSA population size

instance, an advertisement on a public classified ads site like Craigslist.org, or a personal website. The reviewing form demands an Internet contact, including email if available, and a telephone number for the worker. In addition, reviewers are asked to provide a detailed free-form narrative of their meeting with the encounter.

Access to most of the information from these reviews, including contact information, is available for free to anyone with Internet access. The exceptions are information on prices and specific services offered, and the more detailed parts of the narratives. Site users who submit two usable reviews in a month receive free access to the additional information; alternatively, users may purchase access for a fee (as we did in order to collect the data).

Based on our interviews with sex workers, we believe TER reviews are highly important in establishing reputation, and workers exert substantial effort to maintain positive reviews on the site. Feedback from bad reviews is rapid and may result in decreased earnings due to a slowdown in business. One interviewee remarked that

> A lot of girls use TER for the ratings. I have dozens of pages of reviews [each page shows ten reviews] on there. It took me years to get those good ratings, and I make good money now because of it, but I had to work my butt off for them.

Notes: Vertical axis plots cumulative number of reviews, across all dates, posted on TER for providers listing the specified primary city, as a share of all reviews from US cities. Horizontal axis plots each city's share of the total population of all US cities included in TER, as measured by the relevant metropolitan statistical area.
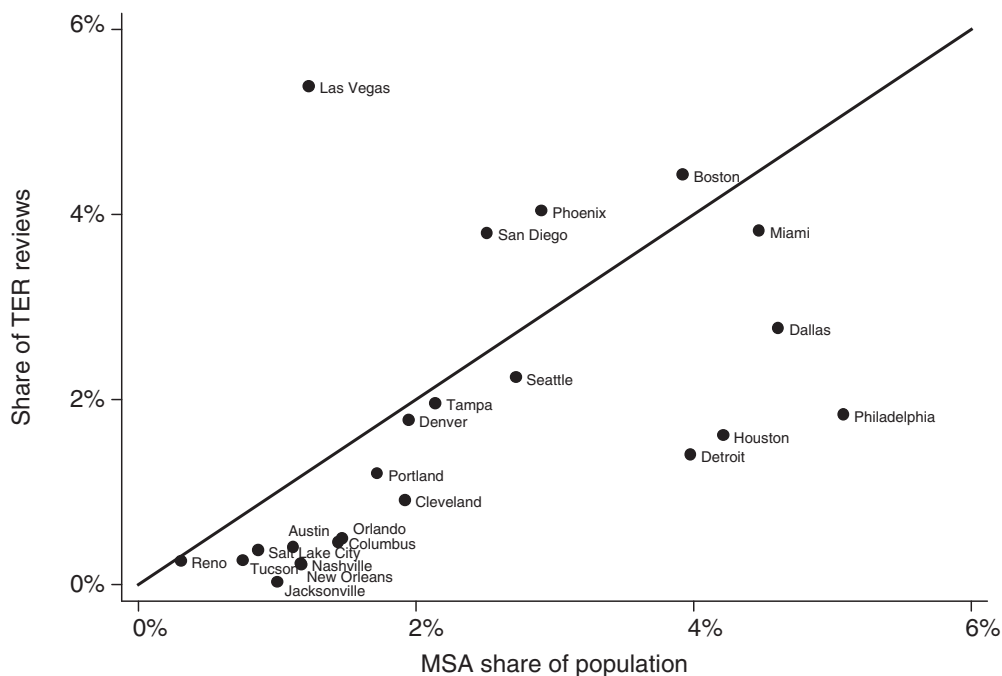
Figure 10.6   Relative popularity of TheEroticReview.com relative to MSA population size, excluding outliers

One interviewee remarked to us that clients sometimes threaten to leave poor ratings on the site in order to extort price or service concessions from sex workers. For instance, in a high-profile and well-publicized case, Dave Elms, the CEO and founder of TER, was arrested in 2008 on weapons and narcotics violations. The police investigation of Elms also turned up evidence that he had been extracting sexual favors from prostitutes reviewed on his site in exchange for removing damaging reviews about them (Richtel, 2008).

Other than through this type of activity, there are two major ways TER review data could potentially be corrupted. First, users could submit inauthentic reviews in order to gain access to the site's restricted price and narrative details. Such activity is likely to be rare since all other information, including contact and website information, is available for free to all users, and price information can usually be determined independently through these means. Moreover, as we will show below, the review form is extremely detailed and takes several minutes to fill out, even with falsified information. Finally, users do not gain access to the price and narrative information until their reviews have been checked by TER staff, which takes several days, so impatient users attempting to gain access to restricted information would likely be dissuaded.

Second, sex workers may attempt to "review" themselves in order to appear to have

more or better reviews than they actually do. In order to combat this type of fraud, the site allows users to "click through" a reviewer's screen name to see all other reviews supplied by that client. Thus, reviews from persons who have not reviewed many other workers (as would likely be the case with this type of fraud) can be discounted by users. Nevertheless, to the extent that either type of falsified reviews is a concern, researchers can check their results by using only data on workers with more than a specified number of reviews, or only reviews from reviewers who have supplied a specified number of other reviews.

A potential limitation, but also a strength, of the data is its temporal nature. Characteristics, services, and prices are posted on the site based on the initial reviewer's observations. Additional users may review the same worker, and the appearance and performance ratings, as well as the user-supplied narratives, will be grouped together on the site, but it appears that the original characteristics, services, and prices are generally not updated over time. Thus, the characteristics in the data are best thought of as representing "new entrants" to the site at a particular date. This fact about the data means there is relatively little within-provider temporal variation for researchers to exploit, but by the same token, it also allows researchers to observe changes over time in the characteristics and prices of sex workers appearing in the market at different dates, which can be matched to temporal location-specific economic and social conditions or particular events.

Another possible limitation is the potential for the same worker to be reviewed multiple times under different names. In general, TER appears to match new incoming reviews with individuals already reviewed on the site by telephone number, website URL, and email address, and the fact that many workers have scores, if not hundreds, of reviews, indicates that the matching process appears to work reasonably well. However, we have come across isolated cases of individuals who appear, from a comparison of photographs, to be the same person, but who are listed as two different people, perhaps because they changed their contact information. To the extent that such match failures were a random sample of all individuals reviewed, most analyses would be little affected; however, researchers should consider the potential effects on their results if workers who change contact information frequently are systematically different from others.

4.2   Summary Statistics

As noted above, TER reviews are extraordinarily detailed. For instance, the review form requests categorical descriptions of four distinct variables related to breast appearance alone.[18] Table 10.1 displays means (and for non-categorical variables, standard deviations) for only a fraction of the available variables, focusing on a few key characteristics. For simple comparisons over time in these unconditional means, we segment the data into three time periods when the site has been active. Moreover, since we will also be doing so in the hedonic analysis that follows below, we exclude from this table all observations from: transsexuals or transgendereds (other than these, there are no males reviewed on TER), "rip-offs" (where the reviewer indicated that the worker did not "deliver as promised"), and those with outlier values for calculated real hourly wage (less than $50

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[18]   These are: estimated cup size (e.g., C), estimated chest size (e.g., 36), overall breast appearance, and whether the worker appears to have implants.

Table 10.1   Summary statistics for sex workers listed on TheEroticReview.com 1999–2002, 2003–2005, and 2006–2008

Category	Variable	1999–2002	2003–2005	2006–2008
Wage	Calculated real hourly wage ($2003)	$263.13	$281.80	$313.35
Advertised Service	Escort	0.714	0.771	0.813
	Escort with anal sex	0.020	0.020	0.025
	Sensual massage	0.195	0.131	0.093
	Tantra	0.006	0.004	0.002
	Massage with fellatio	0.033	0.024	0.016
	Bondage/S&M	0.018	0.020	0.135
	Group sex	0.015	0.030	0.037
	Number of different services offered	1.427	1.227	1.249
	(standard deviation)	(0.759)	(0.604)	(0.584)
Business Practices	Length of session in minutes	64.231	64.479	61.005
	(standard deviation)	(41.933)	(39.664)	(35.405)
	Independent	0.531	0.453	0.584
	Incall only (escort provides location)	0.380	0.350	0.310
	Outcall only (client provides location)	0.209	0.165	0.129
	Incall and outcall	0.406	0.483	0.560
	Showed up on time	0.931	0.938	0.943
	Rushed service	0.266	0.263	0.237
	Advertises with email address	0.333	0.399	0.383
Sexual Practices	Does not kiss	0.420	0.357	0.382
	Kisses, no tongue	0.238	0.228	0.217
	Kisses, with tongue	0.342	0.415	0.402
	No oral sex	0.163	0.137	0.110
	Oral sex, with condom	0.488	0.428	0.455
	Oral sex, no condom	0.348	0.435	0.436
	Cunnilingus	0.558	0.582	0.571
Apparent Age	18–20	0.082	0.104	0.132
	21–25	0.388	0.444	0.448
	26–30	0.287	0.256	0.238
	31–35	0.148	0.113	0.101
	36–40	0.058	0.052	0.047
	41–45	0.025	0.022	0.022
	46 +	0.013	0.009	0.011
Race/ Ethnicity	White	0.540	0.520	0.517
	Black	0.073	0.087	0.123
	Asian	0.164	0.174	0.148
	Hispanic	0.128	0.135	0.142
	Foreign	0.079	0.069	0.052
	Other	0.016	0.016	0.018
Body type	Thin	0.315	0.344	0.331
	Athletic	0.272	0.284	0.274
	Average	0.198	0.185	0.192
	Muscular	0.004	0.004	0.004
	Baby fat	0.131	0.115	0.124

Table 10.1   (continued)

Category	Variable	1999–2002	2003–2005	2006–2008
Wage	Calculated real hourly wage ($2003)	$263.13	$281.80	$313.35
	Fat	0.064	0.052	0.058
	Other	0.015	0.016	0.017
Height	Less than 5′3″	0.140	0.160	0.165
	Between 5′3″ and 5′8″	0.776	0.758	0.756
	Greater than 5′8″	0.084	0.082	0.079
Breasts	Breast cup A	0.058	0.069	0.070
	Breast cup B	0.291	0.313	0.307
	Breast cup C	0.341	0.343	0.339
	Breast cup D or larger	0.308	0.275	0.284
	Breast implants	0.180	0.143	0.130
Hair	Black color	0.246	0.282	0.301
	Brown color	0.306	0.328	0.332
	Blonde color	0.273	0.269	0.257
	Red color	0.061	0.055	0.049
	Bleached color	0.105	0.054	0.047
	Other color	0.009	0.012	0.013
	Curly	0.356	0.345	0.351
	Below shoulders or longer	0.427	0.464	0.449
Other appearance	Pierced	0.158	0.203	0.210
	2 or more tattoos	0.126	0.175	0.227
	Shaved genitalia	0.271	0.396	0.515
	Non-smoker	0.742	0.724	0.717
Reviews	Number of reviews	11.092	6.529	4.060
	(standard deviation)	(29.190)	(16.250)	(8.155)
	Mean appearance review (1–10)	7.034	7.316	7.396
	(standard deviation)	(1.073)	(1.079)	(1.142)
	Within-provider standard deviation of appearance reviews	0.468	0.393	0.329
	(standard deviation)	(0.488)	(0.474)	(0.447)
	Mean performance review (1–10)	6.706	7.057	7.149
	(standard deviation)	(1.373)	(1.385)	(1.402)
	Within-provider standard deviation of performance reviews	0.611	0.510	0.408
	(standard deviation)	(0.671)	(0.653)	(0.607)
N	Number of observations	15,008	30,257	34,042

Notes: All values in table are sample means, except for continuous variables where standard deviations are noted in parentheses below the mean. Date ranges refer to the year a worker was first reviewed.

or more than $1,500). Of the 96,516 sex workers reviewed on the site in our data, these culls reduce the total number of observations (across all years) to 79,307.

Calculated hourly wage is computed using two variables provided by the reviewer on the amount paid for a particular session, and the length of that session. The advertised service is based on a drop-down menu in which the reviewer indicates the type of service

purchased for the specified session. While some workers offer multiple services for different prices (see the "number of services offered" variable), the indicator variables in the advertised services section of Table 10.1 focuses on the first-listed service for each individual. Based on a careful reading and classification of hundreds of the detailed narratives written by reviewers,[19] it appears that "escort" service typically includes oral and vaginal sex, but not anal sex. "Escort with anal sex" service includes anal sex specifically, but vaginal and oral sex are not uncommon in addition. "Sensual massage" generally includes partially or fully nude massage and manual stimulation, while "Massage with fellatio" includes these as well as oral sex. "Tantra" focuses on various spiritualized sexual practices, and "Bondage/S&M" experiences include some form of fetishized sadism. "Group sex" indicates that the session involved two or more sex workers together with the client.

Turning to the business practices variables in Table 10.1, roughly half of workers reviewed are "independent", indicating that the worker appears to operate without a pimp, agency, driver, or other assistant. "Incall only" indicates that the worker offers service at her own location exclusively, while "Outcall only" indicates that the worker only offers service at the client's location.

Other characteristic variables are fairly self-explanatory, but some attention to the "reviews" category is warranted. On the review form, site users are asked to rate the worker's overall appearance and "performance" on a scale from 1 to 10, with higher ratings being more favorable. The average appearance review, for instance, was slightly better than 7 out of 10. We also provide data on the within-provider standard deviation of each of these ratings; a lower standard deviation indicates that a worker is reviewed more consistently by different clients. Obviously, these ratings are subjective, and specific to those clients who choose to see a particular worker (for instance, men who prefer women with blonde hair will generally select blonde escorts and rate them higher than would men who prefer women with brown hair). Nevertheless, they provide a summary view of the level of client satisfaction.

Notably, the calculated hourly wages (computed in real terms, 2003 dollars) of the workers reviewed on TER are quite high, and increasing over time. This, along with the growing share who offer both incall and outcall options, improvements in the share who appear for their assignations on time and do not "rush" their service, and the rise in the average performance review, suggest some improvement over time in the quality of service offered in the industry. As suggested in Section 2, the ability to build and maintain a business reputation, due to sites like TER, may lead to improvements in the quality of service offered by prostitutes. Cunningham and Kendall (2009b) explore this hypothesis more systematically.

4.3   Hedonic Pricing Analysis

To illustrate the potential value of these data to researchers, we next perform a simple hedonic pricing analysis of key prostitute characteristics.

Specifically, we seek to estimate the following equation:

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[19]   The results of this study are available upon request from the authors.

$$\ln (wage)_{icmy} = \beta X_{icmy} + \lambda_m + \eta_c + \gamma_i + \mu_{cy} + \varepsilon_{icmy}, \qquad (10.1)$$

where i indexes individuals, c indexes geographic locations (i.e., cities or regions), m indexes months of the year, y indexes years, and X is a matrix of characteristics (including a constant term). In various specifications, we will include month fixed effects (λ_m), city fixed effects (η_c), individual fixed effects (γ_i), and/or city-year fixed effects (μ_{cy}). For estimation, we employ least squares regression with the Huber-White correction for heteroskedasticity and clustering of standard errors by city.

Table 10.2 presents the estimated coefficients β from three different specifications of equation (10.1), which may be interpreted as semi-elasticities. In the first column of Table 10.2, we include month fixed effects to control for any seasonality in the data, as well as year-city fixed effects to control for unobserved variables associated with a particular city in a particular year. The coefficients may be interpreted as premia on hourly wages associated with a specific characteristic or service. For instance, equation (10.1) indicates that provision of anal sex in addition to escort service is associated with an average 10.5% higher hourly wage than escort service alone (the omitted category) for sex workers who are otherwise identical on all other characteristics. Similarly, massage services generally are priced at a 40.7% discount relative to escort services. Other coefficients may be interpreted similarly.

For several key categorical variables, we also present these results as box-and-whisker plots, indicating the point estimates and 95% confidence intervals, in Figures 10.7–10.10. These facilitate comparisons of magnitude and statistical significance across categories. Many of the signs, if not the magnitudes, on the coefficients presented in Table 10.2 and Figures 10.7–10.10 are unsurprising. For instance, services involving riskier sexual behaviors generally demand premia relative to other services, workers in their 20s receive higher wages than those in their late 30s and 40s, and workers with "thin" and "athletic" body types earn more than those with "baby fat" or "fat" body types.

The length of session variables imply that average hourly wages decline with longer sessions up to around the 5.5 hour mark. Since less than 1% of all sessions were longer than 5.5 hours, this finding likely reflects the fact that there is a substantial fixed cost associated with the provision of sex work. For instance, longer sessions do not generally involve a higher risk of arrest, and the increase in the risk of infection and violence is probably small. Moreover, marginal time during a session may be more likely to be used for non-sexual services such as companionship or foreplay.

Other coefficients in column (1), however, are surprising. For instance, while a unit increase in a worker's average appearance rating is associated with a 9.2% increase in wages, a similar unit increase in a worker's average performance rating is associated with a 2.0% decline in wages. The latter result may indicate important omitted variables. For instance, it may be the case that sex workers differ in their time discount rate, perhaps because some prostitutes work to satisfy a drug addiction requiring immediate relief, while others are engaged in prostitution as a career. Those with low discount rates are likely to offer low prices in order to draw clients quickly, and also may be more willing to perform risky sexual activities (such as unprotected vaginal sex) that result in higher scores for "performance".

Such a mechanism may also be the source of the apparent lack of any premium on oral sex, even unprotected oral sex, and if true, would also suggest that the estimated premia

Table 10.2   Hedonic Wage Regression Coefficients

Dependent Variable: ln(wage)	(1)	(2)	(3)
Length of session (x 100)	−0.547	−0.556	−0.584
	(0.032)	(0.039)	(0.035)
(Length of session)^2 (x 1000)	0.009	0.009	0.009
	(0.0009)	(0.001)	(0.0008)
Service = Escort	–	–	–
Service = Escort with Anal	0.105	0.131	0.232
	(0.023)	(0.011)	(0.015)
Service = Massage	−0.407	−0.413	−0.467
	(0.024)	(0.028)	(0.034)
Service = Tantra	−0.164	−0.169	−0.220
	(0.029)	(0.031)	(0.052)
Service = Massage with Fellatio	−0.185	−0.189	−0.138
	(0.013)	(0.016)	(0.022)
Service = BDSM	−0.130	−0.138	−0.034
	(0.036)	(0.037)	(0.037)
Service = Group	0.507	0.510	0.455
	(0.014)	(0.015)	(0.024)
Independent	−0.007	−0.009	
	(0.011)	(.013)	
Incall only	−0.081	−0.084	
	(0.010)	(0.010)	
Outcall only	0.039	−0.051	
	(0.013)	(0.013)	
Incall and outcall	–	–	
On time	−0.040	−0.035	
	(0.009)	(0.009)	
Rushed service	0.047	0.049	
	(0.004)	(0.004)	
Has email address	0.080	0.080	
	(0.008)	(0.009)	
Non-smoker	0.034	0.036	
	(0.004)	(0.005)	
Age 18–20	–	–	
Age 21–25	0.032	0.032	
	(0.006)	(0.007)	
Age 26–30	0.041	0.038	
	(0.007)	(0.008)	
Age 31–35	0.022	0.016	
	(0.008)	(0.008)	
Age 36–40	0.003	−0.006	
	(0.010)	(0.008)	
Age 41–45	−0.031	−0.035	
	(0.009)	(0.010)	
Age 46 +	−0.044	−0.045	
	(0.016)	(0.019)	

Table 10.2   (continued)

Dependent Variable: ln(wage)	(1)	(2)	(3)
White	–	–	
Black	−0.121	−0.130	
	(0.016)	(0.015)	
Asian	−0.208	−0.215	
	(0.022)	(0.020)	
Hispanic	−0.057	−0.054	
	(0.016)	(0.018)	
Foreign	−0.017	−0.017	
	(0.013)	(0.015)	
Other Race/ethnicity	−0.012	−0.020	
	(0.014)	(0.013)	
Body type = thin	–	–	
Body type = athletic	0.015	0.016	
	(0.004)	(0.004)	
Body type = average	−0.019	0.018	
	(0.005)	(0.005)	
Body type = muscular	0.044	0.052	
	(0.021)	(0.021)	
Body type = baby fat	−0.042	−0.043	
	(0.005)	(0.005)	
Body type = fat	−0.066	−0.065	
	(0.009)	(0.011)	
Body type = other	−0.024	−0.025	
	(0.013)	(0.015)	
Height < 5′3″	–	–	
Height between 5′3″ and 5′8″	0.013	0.015	
	(0.003)	(0.003)	
Height > than 5′8″	0.018	0.021	
	(0.006)	(0.007)	
Breast cup A	–	–	
Breast cup B	0.003	0.001	
	(0.005)	(0.005)	
Breast cup C	0.008	0.008	
	(0.007)	(0.008)	
Breast cup D or larger	0.026	0.028	
	(0.008)	(0.008)	
Breast implants	0.089	0.091	
	(0.005)	(0.005)	
Hair brown	0.023	0.022	
	(0.003)	(0.004)	
Hair blonde	0.034	0.036	
	(0.005)	(0.006)	
Hair black	–	–	
Hair red	−0.007	−0.009	
	(0.008)	(0.008)	

Table 10.2   (continued)

Dependent Variable: ln(wage)	(1)	(2)	(3)
Hair bleached	0.032	0.034	
	(0.007)	(0.008)	
Hair other color	0.005	0.006	
	(0.012)	(0.013)	
Hair curly	−0.005	−0.009	
	(.005)	(0.005)	
Hair long	0.027	0.027	
	(0.005)	(0.005)	
Pierced	0.008	0.010	
	(0.004)	(0.004)	
2 + Tattoos	−0.017	−0.022	
	(0.006)	(0.006)	
Shaved genitalia	0.010	0.010	
	(.003)	(0.003)	
Does not kiss	–	–	
Kisses, no tongue	−0.014	−0.013	
	(0.006)	(0.006)	
Kisses, with tongue	0.047	0.052	
	(0.009)	(.006)	
Offers no oral sex	–	–	
Offers oral sex with condom	0.015	0.012	
	(0.022)	(0.024)	
Offers oral sex with no condom	0.018	0.020	
	(0.018)	(0.020)	
Offers cunnilingus	−0.004	−0.007	
	(0.004)	(0.004)	
Number of reviews (x 10)	0.005	0.004	
	(0.001)	(0.001)	
Average appearance review	0.092	0.095	
	(0.007)	(0.006)	
Standard deviation of appearance reviews	0.026	0.024	
	(0.004)	(0.004)	
Average performance review	−0.020	−0.020	
	(0.002)	(0.002)	
Standard deviation of performance reviews	−0.016	−0.015	
	(0.004)	(0.005)	
Number of services offered	0.004	0.001	
	(0.005)	(0.005)	
Constant	5.319	5.228	5.935
	(0.053)	(0.059)	(0.021)
Month fixed effects?	Yes	Yes	
Year x city fixed effects?	Yes	No	
City fixed effects?	No	Yes	
Year fixed effects?	No	Yes	
Provider fixed effects?	No	No	

Table 10.2 (continued)

Dependent Variable: ln(wage)	(1)	(2)	(3)
R^2	0.46	0.46	0.97
N	79,316	71,901	79,316

Notes: Standard errors in parentheses. Standard errors are robust to heteroskedasticity and are clustered at the city level. Observations are sex workers reviewed at TheEroticReview.com.
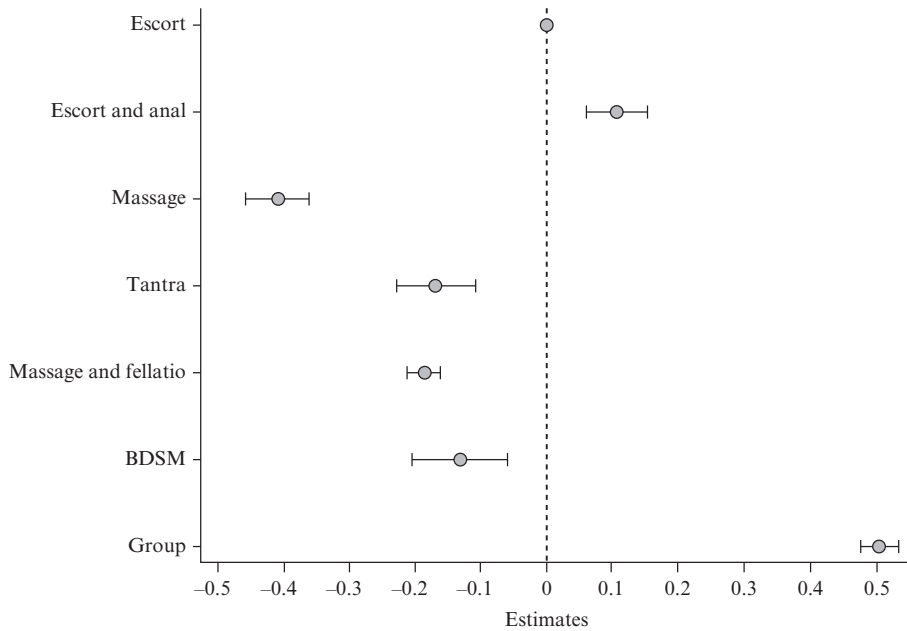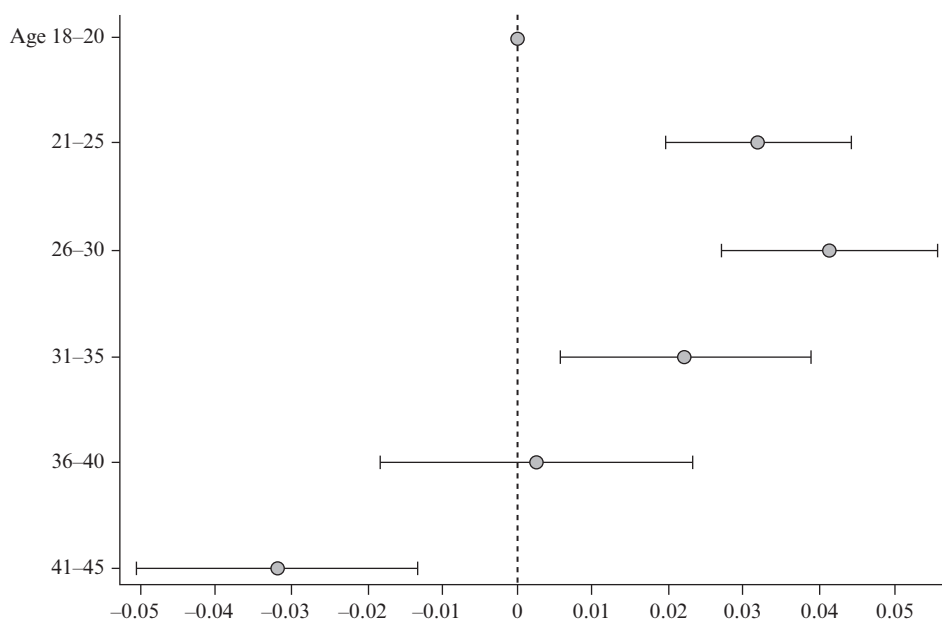

Notes: Dots indicate coefficient point estimates and "whiskers" indicate 95% confidence intervals based on regressions in column (1) of Table 10.2. Coefficients may be interpreted as premia on hourly wages, measured as a percentage, for specified services, compared with "escort" service.

Figure 10.7 *Hedonic estimates of log wage premia by service type*

on anal sex and other services may be biased downward in this regression. To ameliorate the latter problem, we will shortly re-estimate equation (10.1) with individual fixed effects to control for any unobserved characteristics specific to a particular sex worker, including time discount rate.

First, however, we re-estimate equation (10.1) with month, city, and year (but not city-year) fixed effects in column (2) of Table 10.2. Most of the coefficients are similar to those in column (1), but this specification also allows us to estimate a city-specific hedonic price index, i.e., a measure of prostitute prices in each city (or region) invariant to the fact that different characteristics or services may be more prevalent in some cities than others.

Table 10.3 presents, for each city, the unadjusted average calculated hourly wage

Notes: Dots indicate coefficient point estimates and "whiskers" indicate 95% confidence intervals based on regressions in column (1) of Table 10.2. Coefficients may be interpreted as premia on hourly wages, measured as a percentage, for specified age groups, compared with the 18–20 age group.

Figure 10.8   Hedonic estimates of log wage premia by age group

(again, in 2003 dollars), as well as a hedonic price index, calculated as the coefficients on the city fixed effects in column (2) of Table 10.2, normalized such that the most expensive city (London) receives an index value of 100.[20] For comparison, we also present the average values of various key characteristics by city in this table.

Notably, Table 10.3 indicates substantial variation across cities in prices and characteristics. Even focusing only on US cities, hedonic prices in Reno are 52% higher than those in Indiana. This suggests that the geographic market for prostitution is localized, despite the fact that "tours" across cities are common among some sex workers (Brooks, 2006). Consistent with the local markets hypothesis is the fact that many characteristics vary substantially across cities. For instance, breast implants appear to be more prevalent in beach locales with warm weather (e.g., Florida and Hawaii), and less popular in cold weather locales (e.g., Minnesota and Cleveland); this likely reflects the prevalence of implants among the resident population of those locations.

Returning to Table 10.2, column (3) presents coefficient estimates from equation (10.1) using a specification with individual fixed effects. Since, as discussed above, the characteristics data are generally fixed with the first review, this specification only allows us

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[20]   Prices for non-US cities are converted to US dollars before the regression analysis, using the concurrent month's exchange rate.
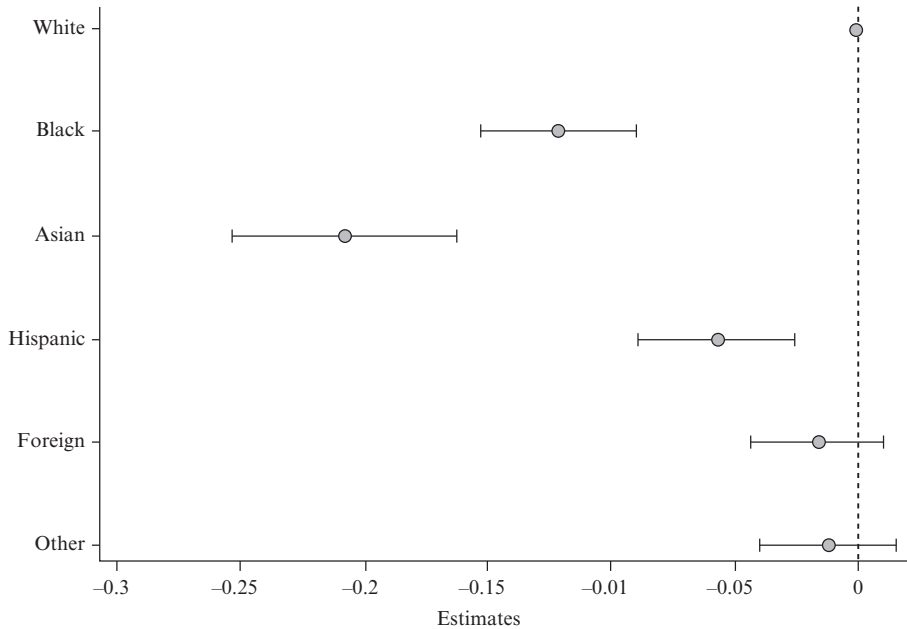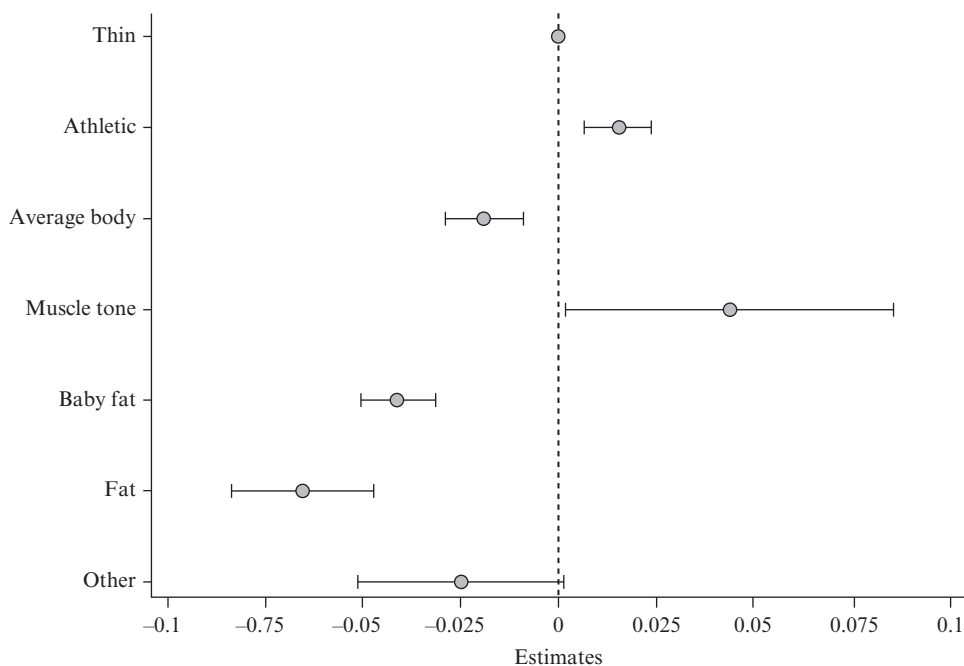
Notes: Dots indicate coefficient point estimates and "whiskers" indicate 95% confidence intervals based on regressions in column (1) of Table 10.2. Coefficients may be interpreted as premia on hourly wages, measured as a percentage, for specified race/ethnicities, compared with whites.

Figure 10.9 Hedonic estimates of log wage premia by race/ethnicity

to estimate coefficients on advertised services and the length of session. The coefficients in column (3) essentially compare different service offerings for the same worker, while those in columns (1) and (2) compare different service offerings across different workers. To the extent that worker-specific omitted variables like personal time discount rate, as discussed above, are important, the coefficients in column (3) may differ from those in the other columns.

The coefficients on length of session on column (3) are similar to those in columns (1) and (2), but the magnitudes of the coefficients on the service-type variables appear to be substantially different. Figure 10.11 plots these in box-and-whisker form, and a comparison between Figures 10.7 and 10.11 shows that the dispersion among the coefficients is higher within a given worker than it is across workers. Thus, for instance, the premium on anal sex is estimated at 10.5%–13.1% in the cross-sectional regressions in columns (1) and (2), but is estimated at 23.2% in column (3). This suggests that the market for sex workers may be appropriately segmented along certain omitted variables associated with both price and service offerings, such as time-discount rate.

Future research exploring such differences may be valuable. In general, however, we believe the ability to use TER data to estimate location- and time-specific characteristics, business practices, and prices of prostitutes will be valuable to family researchers exploring the effects of local labor market conditions, marriage market conditions, and legal frameworks.

Notes: Dots indicate coefficient point estimates and "whiskers" indicate 95% confidence intervals based on regressions in column (1) of Table 10.2. Coefficients may be interpreted as premia on hourly wages, measured in percentage, for specified body types, compared with "thin" body type.

Figure 10.10   Hedonic estimates of log wage premia by body type

5   ONLINE ADVERTISEMENT WEBSITES

As discussed in Section 2, there are a variety of specialized websites used by prostitutes for advertisement. Some, like Backpage.com, offer free ad posting (with some limits on the number of photographs that may be uploaded), while others, like Eros.com, charge advertisers significant sums. In this section, we discuss the potential use of online advertisements as a source of data on prostitution activity. We argue that, although the potential drawbacks of these data should be recognized, they provide a useful source of high-frequency localized data on prostitution markets and behaviors.

5.1   Description of Data

A typical ad in the "female escorts" section of the Boston Backpage.com posting board reads:[21]

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[21]   Advertisement accessed on July 22. For the purpose of anonymity, we redacted the last four digits in the telephone number advertised.

*Table 10.3 Wages and selected characteristics of TER-reviewed workers, by city*

	Obs.	Unadjusted average wage		Hedonic price index	Inde-pendent	Body thin	White	Black	Hispanic	Age 18–20	Breast implants	App, mean	Perf. mean
		Level	Index										
London	1,932	$477.35	100.00	100.00	25.31%	38.51%	39.29%	2.74%	8.28%	11.23%	12.73%	7.90	7.87
Reno	274	$445.20	93.26	89.34	53.28%	30.66%	74.82%	5.47%	8.39%	7.66%	22.99%	7.45	7.09
Las Vegas	1,772	$417.29	87.42	84.30	73.42%	31.26%	64.40%	6.66%	9.65%	10.05%	22.80%	7.64	7.16
Atlanta	3,503	$376.30	78.83	87.07	54.67%	32.54%	46.33%	24.55%	18.07%	10.48%	11.08%	7.28	6.96
Salt Lake City	316	$328.73	68.87	70.14	56.01%	34.18%	68.35%	12.66%	10.13%	23.10%	12.02%	7.27	6.71
Chicago	3,562	$325.88	68.27	77.04	52.16%	32.93%	56.20%	12.07%	11.76%	13.50%	13.17%	7.25	6.91
Toronto	1,735	$322.72	67.61	77.58	29.91%	37.06%	51.24%	3.75%	7.38%	12.85%	15.22%	7.38	7.20
New York City	7,145	$322.26	67.51	76.39	36.67%	37.87%	34.28%	7.66%	18.74%	7.26%	14.65%	7.31	6.98
Phoenix	2,240	$309.02	64.74	67.99	64.78%	31.52%	65.94%	7.90%	14.15%	12.59%	17.10%	7.41	7.18
New Orleans	234	$304.01	63.69	69.53	52.99%	34.19%	78.63%	9.40%	3.85%	9.40%	16.67%	7.20	6.96
Columbus	339	$302.99	63.47	65.38	61.65%	29.79%	87.02%	6.19%	2.36%	10.62%	11.21%	7.61	7.56
Tampa	991	$301.91	63.25	64.65	70.03%	29.77%	73.26%	7.06%	8.68%	9.08%	20.08%	7.45	7.27
Palm Springs	71	$298.65	62.56	69.48	71.83%	25.35%	54.93%	7.04%	16.90%	8.45%	8.45%	7.45	7.22
Boston	2,554	$298.43	62.52	69.90	37.51%	36.37%	63.19%	7.48%	13.27%	10.06%	13.04%	7.29	7.05
Philadelphia	1,272	$293.05	61.39	69.08	46.93%	33.81%	51.42%	14.94%	12.42%	10.93%	12.89%	7.45	7.11
Miami	2,499	$292.34	61.24	63.65	40.26%	34.37%	45.50%	7.63%	36.13%	12.04%	21.29%	7.53	7.23
Los Angeles	8,615	$291.74	61.12	73.37	63.77%	32.83%	36.39%	10.44%	14.27%	8.79%	17.41%	7.10	6.73
Orlando	290	$290.89	60.94	62.34	78.28%	24.83%	55.86%	12.07%	20.69%	20.00%	18.62%	7.37	6.81
San Diego	1,881	$288.84	60.51	69.91	78.79%	30.57%	52.74%	13.40%	15.68%	21.11%	11.54%	7.10	6.64
New Mexico	53	$288.28	60.39	64.73	81.13%	32.08%	64.15%	11.32%	11.32%	5.66%	5.66%	7.01	7.44
Orange County	1,611	$287.99	60.33	70.13	62.69%	32.34%	40.84%	8.13%	12.79%	14.84%	16.57%	7.02	6.65
Tucson	121	$287.54	60.24	61.99	90.08%	29.75%	75.21%	4.13%	8.26%	14.05%	8.26%	7.65	7.47
Austin	372	$284.05	59.51	64.30	66.94%	31.18%	66.40%	6.45%	14.25%	10.75%	11.56%	7.49	7.60
Washington, DC	4,647	$283.88	59.47	69.30	47.04%	31.93%	38.84%	18.76%	18.61%	9.83%	14.31%	7.25	6.85
Jacksonville	11	$282.62	59.21	64.95	81.82%	27.27%	72.73%	9.09%	18.18%	9.09%	45.45%	7.25	7.17
Hawaii	303	$280.67	58.80	73.67	54.46%	30.03%	53.80%	5.28%	4.29%	12.54%	22.44%	7.04	6.57
Nashville	193	$280.29	58.72	61.65	80.31%	27.98%	81.35%	13.47%	1.55%	12.95%	8.81%	7.31	7.34

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Table 10.3 (continued)

	Obs.	Unadjusted average wage		Hedonic price index	Inde-pendent	Body thin	White	Black	Hispanic	Age 18–20	Breast implants	App. mean	Perf. mean
		Level	Index										
Detroit	1,026	$277.17	58.06	61.46	63.26%	27.39%	67.45%	17.64%	8.58%	11.89%	10.82%	7.41	7.31
Vancouver	805	$271.43	56.86	63.86	48.70%	32.67%	73.17%	1.12%	4.84%	12.42%	15.65%	7.29	6.98
Dallas	2,045	$271.19	56.81	58.88	69.34%	30.22%	70.42%	10.27%	7.73%	10.32%	18.19%	7.59	7.45
Minnesota	1,681	$268.85	56.32	63.79	70.55%	30.64%	65.08%	15.23%	7.61%	14.87%	8.21%	7.02	6.54
San Francisco	5,740	$265.86	55.69	71.44	58.21%	36.36%	38.89%	7.72%	10.12%	12.40%	13.87%	7.11	6.79
Montreal	774	$264.44	55.40	57.48	16.54%	43.93%	63.95%	2.45%	4.78%	24.16%	13.05%	7.60	7.56
Denver	1,366	$264.24	55.36	63.12	51.83%	34.77%	68.96%	5.34%	11.13%	8.93%	12.08%	7.43	7.33
Houston	1,588	$263.20	55.14	62.47	37.91%	31.49%	59.07%	8.63%	21.54%	9.07%	22.73%	7.38	7.19
Cleveland	692	$261.55	54.79	61.90	70.52%	34.25%	69.36%	16.91%	7.51%	11.71%	8.24%	7.15	6.75
Seattle	1,527	$260.73	54.62	63.47	51.60%	34.25%	71.19%	6.09%	6.75%	13.00%	12.40%	7.35	7.25
Gold Coast, CA	191	$260.52	54.58	68.68	54.97%	29.32%	45.03%	5.76%	10.99%	13.61%	13.61%	6.75	6.22
Portland	673	$254.75	53.37	58.74	87.07%	26.60%	76.97%	7.88%	4.90%	11.29%	9.06%	7.26	7.25
New England	678	$253.19	53.04	61.77	54.28%	35.10%	53.54%	7.96%	9.00%	8.55%	10.91%	7.13	6.96
New Jersey	2,491	$252.59	52.92	61.82	27.90%	32.80%	42.60%	8.19%	24.93%	11.64%	10.92%	7.09	6.92
Carolinas	1,584	$252.09	52.81	56.83	49.05%	29.29%	76.33%	12.37%	4.73%	11.36%	11.36%	7.31	7.23
Indiana	282	$251.94	52.78	59.10	55.32%	29.43%	86.17%	3.55%	3.19%	6.74%	10.64%	7.25	7.27
Tijuana	222	$170.97	35.82	38.67	30.18%	35.14%	1.35%	0.45%	95.95%	27.48%	4.50%	7.81	8.07

Notes: "Hedonic" wage index calculated from coefficients on city fixed effects variables in column (2) of Table 10.2.
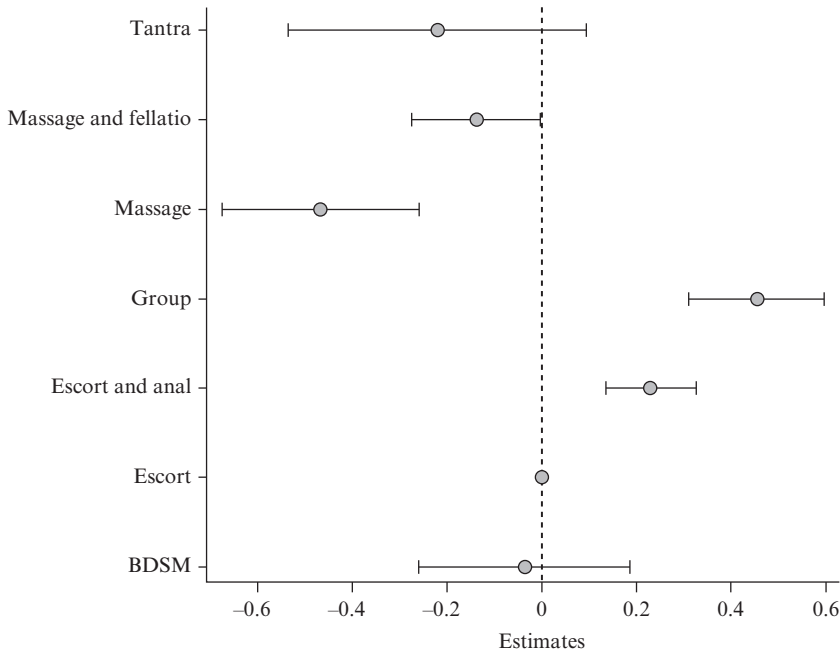
Notes: Dots indicate coefficient point estimates and "whiskers" indicate 95% confidence intervals based on regressions in column (3) of Table 10.2. Coefficients may be interpreted as premia on hourly wages, measured as a percentage, for specified services, compared with "escort" service. Coefficients employ only variation across services for the same worker.

Figure 10.11   Hedonic within-worker estimates of log wage premia by service type

Sexy and Provocative – Luscious and Tantalizing – Enchanting GFE – Chelsea – 29
posted: July 22, 2009, 02:46 PM

You can contact me on 866-925-XXXX

I enjoy being a companion & personal friend to discerning & mature gentlemen. I understand the importance of discretion and use this as the cornerstone of our friendship. The idea of meeting generous & discerning gentlemen with no strings attached is a turn on for me.I have my own personal technique to make you feel on top of the world. Dangerously intoxicating, seductively passionatte and a moment in time that will never be forgotten. Your poison is my pleasure, as I possess a delicate touch that will leave tingling sensations imprinted in your mind long after I'm gone. Come let's cuddle and kiss. Latin Style. I'm a sweet GFE. Just like a long time girlfriend.This spanish beauty would love to sing my spanish lullaby in your ear.

Things you need to know:
I have a voluptuous full figure VIP model/companion..TER Reviewed!! A smaller CLASSY version of a BBW with class in my late 20's. I have long brown hair, honey complexion with soft skin to the touch, seductive green eyes, sweet lips, smoke free white teeth, nice round hips, and a beautiful face. I am 5′8″ in height – Standing taller in heels or boots. My measurements are 38-D/36/38.

All of my sessions are GFE!

$180.00 – 30 mins
$250 – 1 Hour – V.I.P – Treatment – Become Part Of The Royalty Club ♥♥♥♥♥♥
$500 – 2 hrs
$650 – 3 hrs
$150 – each additional hour after

Boston/North Of Boston/Metro West – 128/95 – Upscale Incall –

Rate for Outcall Will Vary Verified Selective Outcalls – Only to
Upscale Locations!

Please do check out my website at [URL REDACTED]

The ad was also accompanied by several photos depicting "Chelsea" dressed in revealing clothes and striking suggestive poses. There is a variety of fascinating sociological, anthropological, and linguistic aspects to these ads, including the use of insider lingo, such as GFE ("girlfriend experience"), indicating the worker offers a high level of intimacy and warmth, likely including kissing on the mouth and possibly unprotected oral sex. Note also the prominent advertisement of reviews at TheEroticReview.com ("TER"), the client reviewing site discussed in the previous section. It is very common for advertisers on these sites to point potential clients to TER and other similar sites.

Researchers can use counts of advertisements during a particular time period to estimate quantities of prostitutes available during that period. Such data are useful for estimating, at a high periodicity, the effects of particular events, such as convention meetings which draw large numbers of potential clients into a particular city (see, e.g., Cunningham and Kendall, 2008). Moreover, as in the ad above, the text of these advertisements frequently supplies additional information on prices, available services, and characteristics of prostitutes.

In order to illustrate the geographic and temporal nature of such data, we collected counts of advertisements from another advertisement site, Craigslist.org, during the month of May, 2009.[22] Table 10.4 shows the average number of ads per day, and daily ads per capita for thirty cities, and reveals wide variation in the frequency of advertisements across cities.

While researchers may employ these data in a variety of ways (we illustrate one interesting example below), they should also be aware of several limitations in the use of advertisement data. First, counts of advertisements may not be perfectly correlated with actual prostitution activity trends if the productivity of the average ad changes over time, which may occur due to changes in the market or in police enforcement levels. Moreover, some sites include non-trivial counts of advertisements for services other than prostitution, such as dating or pornographic websites, which are likely to be of interest to those looking for prostitution services. In some cases, a careful reading is necessary to distinguish these ads from legitimate ads posted by prostitutes.

Second, as in other industries, advertisements are not always truthful. For instance, it

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[22]   Before May 13, 2009, these ads were posted under the "erotic services" category. After that date, Craigslist changed the name of the category to "adult services," and also implemented several restrictions on advertisements; nevertheless, the cross-sectional variation is evident.

Table 10.4　Mean daily advertisement counts on combined local Craigslist "Erotic Services" and "Adult" posting boards

City	Ads per Day	MSA Population	Ads per Day / MSA Population (in 100,000s)
Albuquerque	7.77	845,913	0.92
Atlanta	253.71	5,376,290	4.72
Austin	67.82	1,652,602	4.10
Boston	161.40	4,522,858	3.57
Chicago	314.95	9,785,747	3.22
Cleveland	8.21	2,250,871	0.36
Columbus	15.68	1,773,120	0.88
Dallas	167.08	6,300,006	2.65
Denver	88.48	2,506,626	3.53
Detroit	45.39	4,425,110	1.03
Hawaiian Islands	15.37	1,211,532	1.27
Houston	81.07	5,728,143	1.42
Las Vegas	333.58	1,836,333	18.17
Los Angeles	670.02	12,872,808	5.20
Miami	160.26	5,413,212	2.96
Minneapolis	69.00	3,175,041	2.17
Nashville	14.95	1,521,437	0.98
New Jersey	268.26	8,682,661	3.09
New Orleans	28.84	1,134,029	2.54
New York City	1,690.66	22,694,000	7.45
Orlando	88.74	2,032,496	4.37
Philadelphia	157.08	5,838,471	2.69
Portland	78.92	2,159,720	3.65
Reno	14.00	377,386	3.71
Salt Lake City	24.06	1,115,692	2.16
San Diego	327.11	3,001,072	10.90
San Francisco	770.84	4,203,898	18.34
Seattle	169.35	3,344,813	5.06
Tampa	69.05	2,733,761	2.53
Tucson	16.90	1,023,320	1.65
Washington, DC	367.89	5,529,547	6.65

Notes:　Data based on daily counts of postings in "erotic services" and "adult services" sections of each city's Craigslist.org site during May, 2009.

is not uncommon on some websites for advertisers to use fraudulent photographs. These advertisers hope that customers will be enticed by a more attractive photo, and by the time they actually meet in person, be unwilling to turn away the worker.[23]

　Third, many sites, including Craigslist and Backpage, sell advertising at a fixed rate,

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[23]　In the TER data described in Section 4, reviewers are asked to indicate whether the online photos associated with a worker are "real" or not. 22.4% indicated the photos were not real.

and post ads on a first-come-first-served basis. Thus, the most recent ads are more prominently posted at the top of the webpage. This provides advertisers with incentives to re-post their ads frequently in order to stay close to the top of the page where visibility is highest. Researchers should take care to consider whether the frequency of re-posting may vary systematically in a way that could potentially bias their results.

5.2 Estimating the Effect of an Advertising Price Increase

On November 8, 2008, Craigslist ceased to allow free advertisements in its erotic services section. After that date, advertisers were required to pay $5 per post, and to use an identifying credit card. The change was part of an agreement with 40 state attorneys general, which had demanded that Craigslist eliminate materials associated with prostitution from its site (Stone, 2008).

In this section, we estimate the advertisement supply response from this change. Since the average wage of prostitutes who advertise online, based on data from TER (see Section 4) is over $300, a $5 increase in the price of an ad might not be expected to have a large effect on the market. However, as we will show, advertisement activity on Craigslist dropped dramatically immediately following the price increase. This suggests that the requirement that advertisers use an identifying credit card may have been an effective disruption in the market.[24]

Between August 8, 2008 and April 23, 2009, we collected daily counts of advertisements posted on Craigslist's erotic services sites in four cities: Denver, Seattle, Minneapolis, and Philadelphia. Figure 10.12 shows the daily time series for each city. The date of the price hike (November 8, 2008) is indicated by a vertical dashed reference line. Figure 10.12 illustrates the dramatic decline in advertisement activity on the site after the price hike.

In order to measure precisely the severity of the decrease, we employ a formal difference estimator. Specifically, we seek to estimate coefficients from the following regression specification:

$$\ln(\lambda_{cdmt}) = \beta(Fee_{dmt}) + \eta_c + \theta_m + \nu_d + \varepsilon_{cdmt}, \qquad (10.2)$$

where λ_{cdmt} is the expected number of advertisements posted in city c on day of the week d in month m and date t, Fee_{dmt} is an indicator variable that takes the value 1 for all dates on or after November 8, 2008 across all cities, and η_c, θ_m, and ν_d are city, month, and weekday fixed effects, respectively. Since λ_{cdmt} takes the form of count data, we employ a Poisson estimation technique, and correct the standard errors for heteroskedasticity and within-city clustering.

Table 10.5 presents coefficient estimates of equation (10.2), reporting incidence-rate ratios. Thus, the first column indicates that, using data from all four cities, the number of ads posted after the price hike was approximately 31.8% of what it was before the

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[24] This is consistent with the statement of Connecticut's attorney general, Richard Blumenthal, in response to the Craigslist price hike, "The mere act of authentication will be a very significant deterrent. There are very few prostitutes who want to be called by Craigslist and asked to give additional identifying information" (Stone, 2008).
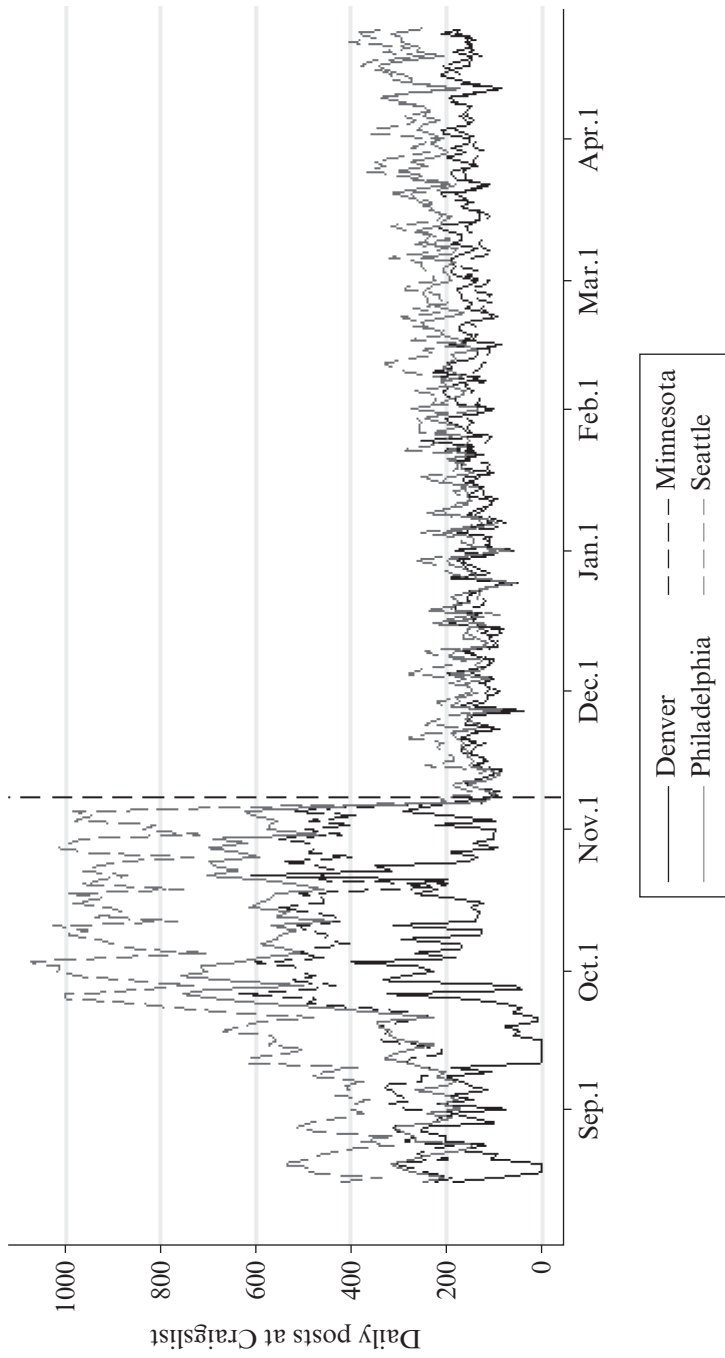
Notes: Vertical reference line indicates date Craigslist imposed free-based policy on erotic services posting boards, November 8, 2008.

Figure 10.12 Effects of $5 price increase on daily advertisement counts on four Craigslist "Erotic Services" posting boards

Table 10.5   *Estimates of the effect of an advertising price increase on counts of Craigslist*
          "Erotic Services" ads

	All cities	Denver	Minneapolis	Philadelphia	Seattle
After price increase	0.318	0.685	0.313	0.290	0.247
	(0.055)	(0.095)	(0.042)	(0.040)	(0.036)
Day = Sunday	0.848	0.891	0.865	0.861	0.813
	(0.018)	(0.071)	(0.049)	(0.052)	(0.035)
Day = Monday	0.983	1.077	0.954	0.965	0.976
	(0.018)	(0.091)	(0.059)	(0.061)	(0.042)
Day = Tuesday	1.018	1.090	1.000	1.032	0.989
	(0.019)	(0.089)	(0.045)	(0.069)	(0.050)
Day = Wednesday	1.040	1.206	1.052	1.026	0.982
	(0.037)	(0.110)	(0.050)	(0.061)	(0.047)
Day = Thursday	0.992	1.040	0.977	0.992	0.983
	(0.010)	(0.084)	(0.468)	(0.064)	(0.048)
Day = Friday	1.046	1.185	1.056	1.030	1.002
	(0.030)	(0.098)	(0.070)	(0.078)	(0.064)
Day = Saturday	–	–	–	–	–
City fixed effects?	Yes	No	No	No	No
Month fixed effects?	Yes	Yes	Yes	Yes	Yes
Observations	1,011	253	253	253	252

Notes: $5 price increase on advertisements occurred on November 8, 2008. Observations are daily counts
of advertisements on city-specific Craigslist "erotic services" posting boards between August 8, 2008,
and April 23, 2009. Coefficients in tables expressed as incident-rate ratios, with standard errors robust to
heteroskedasticity and (in "all cities" column) clustered by city.

increase, a decline of 68.2%. The other four columns estimate equation (10.2) separately
for each of the four cities, and indicate that the effect of the price hike was largest in
Seattle (estimated 75.3% decline) and smallest in Denver (estimated 31.5% decline). As
Figure 12 suggests, Seattle had the highest pre-event average number of ads and Denver
had the lowest. This suggests that marginal advertisers, who were deterred by the price
increase, were concentrated on Craigslist in Seattle, but possibly some other site in
Denver. As in Section 4, this is further evidence for a local geographic market definition.
   Table 10.5 also illustrates an interesting within-week periodicity in advertisement
activity. The estimates indicate that the number of ads is approximately 15% lower on
Mondays, relative to Saturdays, while Wednesdays and Fridays see roughly 4% more
ads than Saturdays.

6   SURVEY DATA

In this section, we discuss a fifth source of data on modern sex workers, surveys. While
other data sources, including those reviewed above, allow researchers to observe char-
acteristics of workers in the prostitution industry, surveys can reveal key personal back-
ground and historical information about workers, as well as subjective perceptions of risk

behaviors. We focus our discussion on an original survey of technology-facilitated sex workers implemented by the authors in late 2008 and early 2009, known as the Survey of Adult Service Providers (SASP).

6.1   Issues in Surveying Sex Workers

Administering surveys to individuals involved in an illegal activity presents a number of problems to the researcher, besides the general concerns associated with survey data generally, all of which increase the cost of collecting such data. Additional precautions must also be taken to maintain ethical standards for research; a close relationship with the relevant institutional review board is a necessity.

First and foremost, the researcher must satisfy participants that (s)he is not a law enforcement officer, or an agent of a taxation authority,[25] and that survey responses are unlikely to be subpoenaed by a court and matched to a participant's true identity. Thus, anonymity is paramount. For SASP, potential respondents received an invitation to take the survey by email, which included a random string of characters and numbers generated by a third party inaccessible to the researchers (the information librarian at Baylor University). When surveys were returned, only the random string was observable by the researchers, not the email address of the respondent.[26] We also allowed participants to take the survey by telephone with one of us or our research assistants if they felt uncomfortable responding electronically.

In the email used to invite survey responses, the anonymity of the survey was repeatedly emphasized. As additional signals that the surveyors were authentic academic researchers, the survey was hosted on Baylor University servers, and a website was posted with answers to frequently asked questions along with links to our personal websites, curricula vitae, institutional review board exemption letter, and research manuscripts. The office telephone number for one of us (Cunningham) was included in the email, with an invitation to call for answers to any questions. Many did so, indicating that participants found this to be a useful means of verifying our authenticity.[27] More than anything else, we learned that being polite and respectful towards the participants went, not surprisingly, a long way towards gaining their trust.

A second difficulty associated with surveying sex workers involves controlling the flow of information during the survey period. Sex workers, especially those operating through the Internet, have developed substantial communications networks online, including private chat rooms and posting boards, as well as simple word-of-mouth links. During

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[25]   Payment for sex work is generally in cash, and since participants are engaging in illegal activity, the marginal cost of failing to report income is low. In our experience, respondents more frequently expressed concern that we were working with the Internal Revenue Service (IRS) than that we were working with police!

[26]   The random string of characters did, however, allow the researchers to be sure that each survey response originated from a different email recipient.

[27]   This also led to additional opportunities to engage participants in informative ethnographic interviews. On the other hand, a few participants called to unleash angry and abusive tirades. Future researchers should be aware that thick skin is a necessity in performing a survey of sex workers.

the period of implementation, we learned that SASP was a frequent topic of discussion through these channels,[28] and there were apparently attempts to dissuade workers from responding to the survey. Since, as researchers, we did not have access to most of these private sites, we (and our assistants) engaged in continuous efforts to encourage responses, including, where possible, contacting our antagonists personally in an attempt to allay their concerns, and asking workers who were friendly towards us to post positive comments about the survey on sites where sex workers congregate. These efforts involved a substantial amount of time and effort, and we believe the survey likely would have been a complete failure otherwise.[29]

A more fundamental issue for all surveys, but which is exacerbated by the underground nature of sex work, is the identification of a useful population from which to draw survey participants. For SASP, we based our population on the set of reviewed workers with email addresses listed on TheEroticReview.com (TER), a customer review website (see Section 4 for further details). TER offers contact information for the largest and most geographically dispersed set of individuals involved in sex work in North America. We supplemented this set of potential participants with all individuals advertising on a popular national escort site, Eros.com. In total, we attempted to contact 26,189 individuals to participate in the survey (see the discussion below regarding response rates), and we believe this population includes a substantial share of all technology-facilitated US-based sex workers.

Nevertheless, our survey design likely undersamples from several important subgroups of workers. First, outdoor workers such as streetwalkers are unlikely to advertise online, and, we believe, are unlikely to be reviewed on TER. Second, workers employed in escort agencies or brothels frequently do not have personal email addresses listed either on TER or Eros.com; commonly, only the agency or brothel manager's email is available. It seems likely that many of these workers were not reached. Third, cases in which personal assistants or pimps are the primary contact for a worker are also unlikely to have been forwarded to the worker herself.[30] Finally, since the majority of our contacts for the survey were workers reviewed by clients, we believe our population may miss some very high-priced workers, especially those who operate entirely through personal referrals.

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[28]   The Las Vegas chapter of Sex Workers Outreach Project (SWOP) promoted the study without our knowledge after a provider we contacted posted the letter online (see here: http://www.scapa-lv.org/whats_hot/research_participation.htm). The moderator of one private board informed us that she considered our attempts to contact providers to be "spam," and that neither she nor any one on her board would participate. One survey participant wrote us that "After much thought and reading on one of the 'Provider Only' boards about you [Cunningham], Yes you and your survey is an on-going topic! I decided to answer most of the questions you asked." (personal email, 9/2008).

[29]   In addition, we also communicated with a number of sex workers and posted general inquiries to public boards associated with sex work before implementing the survey. This helped prepare participants before they received our invitation email, and also allowed us to make adjustments to the wording of the survey instrument based on suggestions.

[30]   This implies that our survey participants are unlikely to include many international workers moving through human trafficking networks, a key interest to law enforcement.

6.2 Survey Methodology and Comparability of Responses

After collecting all available contact information from TER and Eros.com, the list of potential survey participants was organized by city. We then randomly selected four or five cities per month, and attempted to contact individuals in those cities four times during that month. In addition to emailing participants with a link to the survey, we also attempted to contact a random selection of workers by telephone to encourage them to take the survey. We put the SASP survey in the field in August, 2008 and wrapped up data collection in early June, 2009.

The actual survey instrument (if completed online, and not over the telephone) was distributed and published, and the responses collected and organized, using SNAP 9.2 software,[31] and included approximately 267 questions. Figure 10.13 shows the welcome screen participants saw when taking the survey, and the actual questions asked may be found in the Appendix. Based on timestamps associated with participant answers, respondents took approximately 25 minutes to complete the survey.

Among the original 26,189 emails sent, 13,333 emails were successfully delivered. The high number of "bounce-backs" is unsurprising, given the fact that TER data stretch back to 1998, and many workers active in earlier years may have left the industry or changed contact information (similarly, imagine sending letters to all businesses listed in the last ten years of telephone directories for a city). Consistent with this hypothesis, Figure 10.14 shows the number of emails collected from TER by the year of the worker's first review, and the share of those emails that were undelivered. For workers first reviewed in 1999, nearly 90% of the emails listed were inoperable, while less than 20% of emails sent to workers reviewed in 2009 were rejected.

While 13,333 emails were successfully delivered to a permanent email account, some share of these accounts likely remain open, even while the individual who once used them no longer checks the account regularly.[32] Thus, this number represents an upper bound on the pool of potential participants, and the real response rate is likely much higher as a result. Nevertheless, between August, 2008 until June, 2009, 685 respondents answered our request to take the survey, giving us a lower bound response rate of 5.14%.

While the response rate was low, we considered the survey at least a partial success, given the illicit nature of the participants' employment. Moreover, we believe that the opportunity to learn about the backgrounds and business practices of nearly 700 sex workers is inherently valuable, regardless of the ability to fully generalize our findings to the entire population of all workers.

We can partially characterize the generalizability of the survey to all technology-facilitated sex workers by comparing simple means of key characteristics between SASP respondents and the population of workers reviewed on TER. Since, as suggested by Figure 10.14, most of our survey responses come from among the set of recently reviewed workers on TER, Table 10.6 shows mean age and race characteristics for SASP

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[31] We are indebted to Baylor University electronic librarian, Lance Grigsby, without whom this project could not have been conducted.

[32] Many free email services, such as hotmail.com and yahoo.com, remain open for some period of time, even after the account holder has abandoned them.

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SASP

SURVEY OF ADULT SERVICE PROVIDERS

INTRODUCTION

Thank you for agreeing to participate in our Survey of Adult Service Providers, or SASP for short. Because we take your privacy seriously, we have undertaken a number of security precautions to ensure that your answers are kept confidential and anonymous. You will not be asked to record any information that could be used to identify you, nor will Baylor University keep records of respondent IP addresses. The only data we are recording is the data you give us when you voluntarily answer the survey. We ask only that you answer all questions truthfully whenever possible.

As of mid-2008, little to no survey data exists on Internet-based adult service providers. While writers from within the industry and observers of the industry have written numerous books and articles on service providers, and Internet forums, newsletters and trade magazines continually share this knowledge, systematic evidence on the determinants of your wages is missing. We also know very little about things like worker safety, work-related risks, or compensation you receive for exposing yourself to risk.

The primary purpose of our study is to better understand the determinants of your wages, and how the risks you face on the job affect those wages. To better understand this, we will be asking you to share with us information about your job experience, your personal characteristics, and the transactions themselves.

This survey is intended to be completed privately by individuals working as escorts, not by their friends, business associates, or others. If this survey was sent to you in error, please do not complete the survey. If you prefer to mail us your answers without your email, even though we pledge to destroy that information, please do so. If you prefer to have this survey conducted over the telephone, we can also accommodate that request. You can reach us whichever way is best at the contact information below.

(Next >>)

Figure 10.13   Snapshot of SASP introductory page

Emails bounceback rate by year
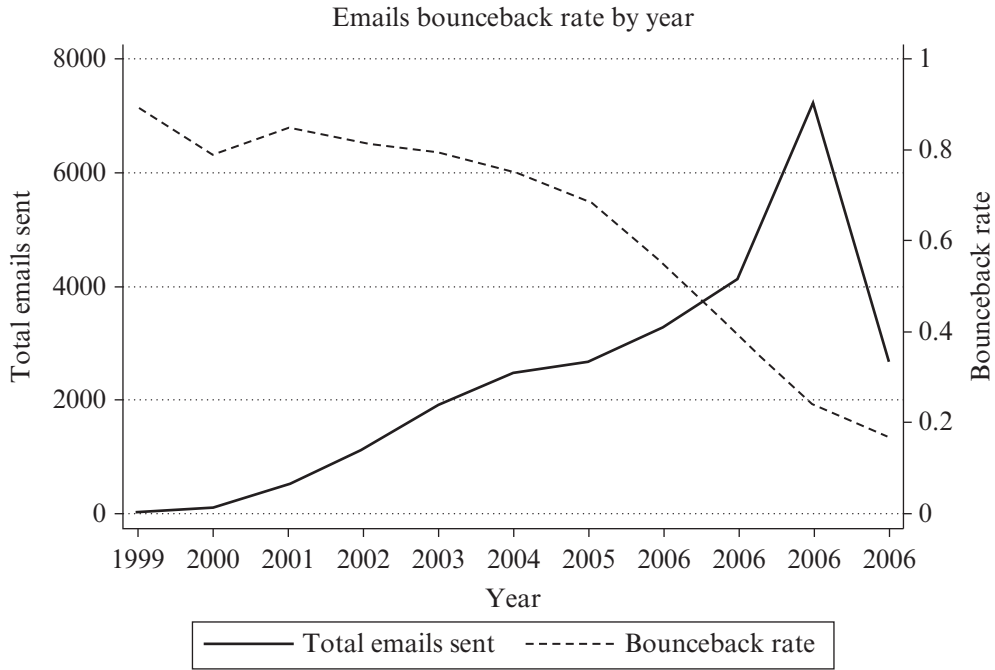
Notes: "Bounceback" rate is the share of total emails sent which were undeliverable.

Figure 10.14   Survey invitation email sent and "bounceback" rate, by year

Table 10.6   Comparison of age and race characteristics among SASP, TER, and NIBRS datasets

		SASP (2008/2009)	TER (2007/2008) Active subset	TER (2007/2008) Full sample	UCR Arrests (2007)
Age Group	18–20	1.8%	10.1%	12.9%	13.2%
	21–25	12.3%	41.9%	44.8%	18.3%
	26–30	18.9%	26.2%	24.3%	14.6%
	31–35	19.2%	12.0%	10.2%	13.2%
	36–40	17.2%	5.7%	4.6%	14.6%
	41–45	14.7%	2.6%	2.2%	12.8%
	46+	16.3%	1.4%	1.2%	11.0%
Race	Asian	3.3%	9.9%	13.9%	2.2%
	Black	4.2%	10.1%	13.2%	39.2%
	White	81.4%	57.5%	50.6%	57.6%
	Hispanic	2.9%	13.7%	15.5%	N/A
	Unknown/Other	8.3%	8.7%	6.9%	0.9%

Notes: TER "active subset" includes only reviewed workers for whom survey invitation emails were able to be delivered. SASP responses are unweighted. Age distribution of arrests is for females only.

respondents, and for workers first reviewed on TER in 2007 and 2008. For the latter group, we also distinguish between all TER-reviewed workers during that time period, and the subset for whom our survey invitation emails did not bounce back.[33] Table 10.6 also shows, for comparison, similar means derived from the FBI's 2007 UCR data (see our discussion of law enforcement data in Section 2).

A comparison of the age and race distributions in Table 10.6 shows that there is a higher concentration of young workers (aged 21–30) in the TER data than there are among SASP respondents. SASP respondents were also more likely to be white compared to all TER-reviewed workers, and less likely to be Asian, black or Hispanic.

Comparing the SASP and TER samples to UCR, arrested prostitutes recorded in UCR data are generally older, and include more black, and fewer Asian, workers.[34] Since, as noted in Section 2, most prostitutes who come into contact with law enforcement are outdoor workers, this suggests sizeable differences in the typical characteristics of outdoor and indoor workers. This may be due to differences in home Internet penetration rates by race (Prieger and Hu, 2008), racial specialization in prostitution markets by customers or workers, or differences in policing between neighborhoods within cities. Further research is needed to illuminate the source of racial differences among indoor and outdoor workers.

6.3   Estimates of Education and Family Characteristics of Internet-facilitated Sex Workers

While a full analysis of all survey questions in SASP is beyond the scope of this chapter, we illustrate the potential value of surveys like SASP by estimating the prevalence of several educational, family, and employment background characteristics among sex workers who employ modern technology.

In order to generalize the responses of our SASP participants to the pool of technology-facilitated sex workers, we adjust our sample using probability weights constructed from the distribution of characteristics of TER-reviewed workers and SASP respondents. Specifically, we calculated the share of individuals reviewed on TER in each age-race category, and divided that share by the similarly calculated share of SASP respondents in that same category. Thus, for instance, there are 1,155 white workers between ages 31 and 35 reviewed on TER, which is 11% of all TER-reviewed workers. Likewise, there were 99 white SASP respondents aged 31–5, which is 15% of all SASP respondents. The inverse probability of appearing in our sample is therefore 0.72 (= 0.11/0.15) for whites aged 31–5. This process allows us to present estimates of population means and linearized standard errors using these probability weights.

SASP respondents were asked about the level of education that they had received, as well as that of their parents, and own family structure, including whether they had any children (see survey questions in the Appendix). The probability-weighted means for

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[33]   We ignore here the fact that we supplemented our population of TER-reviewed workers with advertisers at Eros.com because similarly formatted information on age and race is not available there.

[34]   UCR does not distinguish Hispanic as a separate racial group.

Table 10.7 Estimated Internet-facilitated sex worker population characteristics, select family, education, and business variables

		Probability-weighted mean	Linearized standard error
Highest education level reached	No high school degree	0.072	0.018
	High school graduate	0.117	0.022
	Some college	0.404	0.032
	College or post-college graduate	0.406	0.030
	Currently enrolled	0.196	0.029
Marital and family status	Single/never married	0.440	0.035
	Cohabitating but unmarried	0.226	0.039
	Married, living with spouse	0.128	0.018
	Married, separated from spouse	0.049	0.011
	Divorced	0.153	0.021
	Widowed	0.005	0.002
	Any children	0.377	0.036
Mother's highest education level reached	No high school degree	0.137	0.026
	High school graduate	0.206	0.024
	Some college	0.210	0.027
	College graduate	0.320	0.038
	Post-college graduate	0.114	0.018
	Unknown	0.013	0.006
Business practices	Years in sex work industry	5.46	0.256
	Age at first entry into industry	23.62	0.263
	Ever quit sex work	0.604	0.034
	Have another job	0.429	0.035
	Hours worked in other job	28.276	1.140

Notes: Observations are respondents to SASP survey described in text, and are weighted according to their share of all respondents, relative to the share of workers with similar race and age in the population surveyed.

some of these variables are summarized in Table 10.7. As the table shows, sex workers who operate their businesses through the Internet are quite well-educated, with nearly 80% having some college exposure, and nearly 40% graduating from college – a fact at odds with popular perceptions of prostitutes.

The issue of family structure among sex workers has been a focus of recent economic literature on prostitution (Edlund and Korn, 2002; Arunachalam and Shah, 2008). We estimate that 23.3% of sex workers were cohabiting with a partner, and another 12.7% were married and living with their spouse. Thus, we estimate that over a third of modern sex workers are in partnered relationships. Ethnographic interviews with various workers revealed that spouses and partners were typically aware of, and even complicit in, the sex worker's labor supply, frequently working as a manager or assistant. These results indicate the necessity for a fuller understanding of the complex relationship between prostitution and marriage. Also contrary to popular perceptions, respondents appear to have grown up in well-educated households, with over 64% of mothers having at least some college exposure.

Turning to business practices, we estimate that the average time spent in the sex work industry, at the time of the survey, was 5.57 years, with an average age at first entry into the profession of 23.94. Most respondents did not work continually thoughout this time, however; over 59% stated that they stopped working in the industry for some period of time after entry. Interviews with providers confirmed that attempts to "retire" are common, though frequently temporary. While some departures from sex work are due to marriage or other personal factors, economic conditions appear to be important as well. Frequently, we heard that the current economic downturn has led to significant churn in and out of the industry. Many interviewees noted what economic theory predicts – a decrease in sex worker wages caused by an expansion in supply and a decline in demand. For some women, wage declines led to increases in hours worked or declines in acceptable client quality, while for others, market wages fell below reservation values, leading to exit from the industry.[35]

7   CONCLUSION

Prostitution continues to be an important aspect of family behavior, and a key issue in prohibition and regulation. We have argued in this chapter that, due to data limitations, relatively little is known about prostitution in modern societies where sex workers use the Internet and other new technologies to facilitate their work. We have thus outlined a range of useful data researchers can employ to study modern prostitution, including that collected by law enforcement, client reviews, advertisements, and surveys. We close by encouraging researchers to further exploit these data sources to fill the wide lacunas in knowledge about this critical, but poorly understood industry.

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[35]   As one woman put it, "I can't keep lowering my prices. I find the work degrading when the prices fall this low."

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APPENDIX: SASP SURVEY INSTRUMENT

I   Introduction

Thank you for agreeing to participate in our Survey of Adult Service Providers, or SASP for short. Because we take your privacy seriously, we have undertaken a number of security precautions to ensure that your answers are kept confidential and anonymous. You will not be asked to record any information that could be used to identify you, nor will Baylor University keep records of respondent IP addresses. The only data we are recording is the data you give us when you voluntarily answer the survey. We ask only that you answer all questions truthfully whenever possible.

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The primary purpose of our study is to better understand the determinants of your wages, and how the risks you face on the job affect those wages. To better understand this, we will be asking you to share with us information about your job experience, your personal characteristics, and the transactions themselves.

This survey is intended to be completed privately by individuals working as escorts, not by their friends, business associates, or others. If this survey was sent to you in error, please do not complete the survey. If you prefer to mail us your answers without your email, even though we pledge to destroy that information, please do so. If you prefer to have this survey conducted over the telephone, we can also accommodate that request. You can reach us whichever way is best at the contact information below.

Section One: Background Information

In this section, we would like for you to share some information about your background. We ask these questions so that we can compare your answers to other providers with similar characteristics.

1. Are you male or female?
2. Which of the following best describes your race/ethnicity?
   - ❑ White
   - ❑ Black
   - ❑ Asian
   - ❑ Hispanic
   - ❑ Other
   - ❑ Multiracial

2b. If you answered "Other," please specify:

2c. Since you selected "Multiracial," please check all that apply:
   - ❑ White
   - ❑ Black
   - ❑ Asian
   - ❑ Hispanic
   - ❑ Other

2d. Please list additional racial types below:

3. Are you transsexual?
4. Are you transgendered?
5. Were you born in the United States?

5b. Please indicate which country you were born in:

6. How old are you?
7. How tall are you?

Feet:

Inches:

8. Roughly speaking, how much do you weigh?
9. Have you completed high school or received a GED?
10. Have you attended college for any period of time?
11. Did you receive a college degree?
12. Are you currently a student in any formal educational program, such as a college degree?
13. What was your mother's highest level of education?
    - ❑ Less than 12th grade
    - ❑ High school graduate or GED equivalent
    - ❑ Some college
    - ❑ College graduate
    - ❑ Post-graduate
    - ❑ Don't know
14. What was your father's highest level of education?

    ❑ Less than 12th grade
    ❑ High school graduate or GED equivalent
    ❑ Some college
    ❑ College graduate
    ❑ Post-graduate
    ❑ Don't know

15. Which of the following best describes your marital status?
    ❑ Currently married and living with your spouse
    ❑ Married but not currently living with your spouse
    ❑ Single and never married
    ❑ Divorced and not remarried
    ❑ Widowed and not remarried
    ❑ Cohabitating (living with a partner) but unmarried

16. How many years have you been married?
17. How many years have you been married?
18. How many years were you married?
19. How many years have you been widowed?
20. How many years have you been living together? If less than one year, type "0."
21. Do you have any children?
22. What are the ages of your children? If you have more than one child, please separate each age by a comma. Also, if your child is 1½, just write 1.
23. How many brothers or sisters do you have? Include any step-brothers or step-sisters who lived in the same home with you for most of the time when you were growing up.
24. How many of these brothers or sisters are OLDER than you?

Section Two: Historical Experience Questions

We define "adult service provider" as an occupation in which companionship and/or intimacy is provided in exchange for money. I'd now like to ask you some questions about your career as a provider.

25. At what age did you first work as an adult service provider?
26. Have you ever stopped working as an adult service provider?
27. For how many months did you stop working as a provider the last time you quit?
28. We consider a provider to be "independent" if she runs her own advertisements and solicits her own customers. Do you work as an independent?
    ❑ Yes, I work as an independent.
    ❑ No, I work for a brothel.
    ❑ No, I work for an escort agency.
    ❑ No, I work for a massage parlor.
    ❑ No, I work for a man who solicits customers for me.
29. Have you ever worked as an independent?
30. How many years did you work as an independent?
31. How many years have you worked under your current management?

32. Were working conditions (other than pay) better or worse when you worked as an independent?
33. Was your take-home pay better or worse as an independent?
34. Did you feel better protected and safer when you worked as an independent?
35. Why did you discontinue working as an independent?
36. What keeps you from working as an independent?
37. Have you worked for a massage parlor?
38. How many different parlors have you worked for in your lifetime?
39. How many years did you work at a parlor?
40. Were working conditions (other than pay) better or worse with a parlor?
41. Was your take-home pay better or worse with a parlor?
42. Did you feel better protected and safer when you worked for a massage parlor?
43. Why did you discontinue working for a massage parlor?
44. Have you worked for a brothel?
45. How many different brothels have you worked for in your lifetime?
46. How many years did you work at a brothel?
47. Were working conditions (other than pay) better or worse with a brothel?
48. Was your take-home pay better or worse with a brothel?
49. Did you feel better protected and safer when you worked for a brothel?
50. Why did you discontinue working for a brothel?
51. Have you worked for an escort agency?
52. How many different escort agencies have you worked for in your lifetime?
53. How many years did you work at an escort agency?
54. Were working conditions (other than pay) better or worse with an escort agency?
55. Was your take-home pay better or worse with an escort agency?
56. Did you feel better protected and safer when you worked for an escort agency?
57. Why did you discontinue working for an escort agency?
58. Some adult service providers work for a man who solicits customers for them, usually in return for a share of their earnings. Have you ever worked for a man who fits this sort of description?
59. How many different men of this kind have you worked for in your lifetime?
60. How many years, total, were you employed by this kind of management?
61. Were working conditions (other than pay) better or worse with this man?
62. Was your take-home pay better or worse with this man?
63. Did you feel better protected and safer when you worked for this man?
64. Why did you discontinue working for this man?
65. Finally, have you ever solicited your customers from a public place, like a street, alley, highway, or parking lot?
66. How many years has it been since the last time you tried to solicit a customer from a public place, like a street?
67. Were working conditions (other than pay) better or worse when you worked in public places, like streets?
68. Was your take-home pay better or worse?
69. Did you feel better protected and safer when you worked in public places, like streets?
70. Why did you discontinue working from public places, like streets?

Section Three, Part A: Current Business Questions (Non Sensitive)

In the next section, we'd like you to tell us a little bit about your current business practices and environment, including your beliefs about the risks of your work, questions related to screening clients, and other questions related to your work and private life.

71. Did you see any clients in the last week?
72. How many clients did you see in the last week?
73. How many of them were regulars (customers you see frequently)?
74. How many days (including evenings) in the last seven days did you work?
75. About how much money did you make from working as an escort in the last week? Please indicate a dollar amount (example: $5.22, $5, or $5.00):
76. Besides being a provider, do you have another job?
77. On average, how many hours a week do you work at your other job?
78. Do you have medical or health insurance?
79. Do you have Medicaid insurance?
80. In what state do you conduct most of your business as an escort?
81. In the state you listed above, In which city do you conduct most of your business as an escort?
82. How far do you travel typically to meet with a client?
    - ❑ 0–1 mile
    - ❑ 1–10 miles
    - ❑ 10–100 miles
    - ❑ More than 100 miles
83. What's the farthest distance you've traveled to meet a client?
84. What's the farthest distance one of your current clients has traveled to meet with you?
85. Do you expect to be working as an adult service provider this time next year?
86. Do you expect to be working as an adult service provider in five years?
87. What do you plan to be doing after you stop working as an adult service provider?

Section Three, Part B: Current Business Risks

I would now like to learn more about some of the risks you face in your work.

88. Do you usually undertake safety procedures – for example, conducting a background check, verifying client identification, or using a search engine to find the client's telephone number or email address – before meeting a prospective client?
89. Which of the following safety procedures do you usually undertake before meeting a prospective client? Check all that apply.
    - ❑ Insist on seeing a state-issued ID or other identifying information
    - ❑ Use search engine to find the client's telephone number or email address
    - ❑ Require one or more references from other escorts
    - ❑ Perform a background check
    - ❑ Insist on membership in RS2K or other verification services
    - ❑ None of the above
    - ❑ Other

90. Since you selected "Other," please specify:
91. On a scale of 1 to 10, with 10 being very likely and 1 being not at all likely, what do you think is the chance you will ever be arrested by the police for anything you do in the course of your work as a provider?
92. On a scale of 1 to 10, with 10 being very concerned and 1 being not at all concerned, how concerned are you that your friends or family might find out that you are employed as a provider?
93. On a scale of 1 to 10 with 10 being very concerned and 1 being not at all concerned, how concerned are you that one of your clients will become violent towards you?
94. On a scale of 1 to 10, with 10 being very likely and 1 being not at all likely, how likely do you think it is that you will contract HIV from working as a provider?
95. Have you ever been physically assaulted by a client in a way that injured you?
96. Did you file a police report against him or seek to have him held legally accountable for his assault?
97. Have you ever been verbally assaulted by a client?

Section Three, Part C: Recent Transactions, Price Data (Sensitive)

The following questions are the most sensitive of all the questions asked so far. I will ask you about your experiences with the last five clients, and will specifically ask you about issues like vaginal sex, condom use and negotiations with clients on price and condom use. These are some of the most important questions in the survey. Please remember that all of your answers are purely confidential. If you do not wish to answer any specific question, please simply skip it and move on to the next question. Even if you feel you can only answer some of the questions in the survey, please answer as many as you can.

In the following questions, I will ask you about events that happened between you and your most recent clients. For the sake of time, I am interested only in the last 5 clients, and so will list these clients from the most recent as Client #1 to the least recent as Client #5.

Client #1

98. Was client #1 a male, a female, or a couple/group of individuals?
99. What race was client #1?
100. If you answered "Other," please specify:
101. How old would you say client #1 was? (Guess if you don't know exactly. For instance, if between 20–30, say 25)
102. Indicate the race of the individual members of the group or couple. Check all that apply:
103. Since you also checked "Other," please specify:
104. Indicate the ages of each of the individuals involved. Separate each age with a comma.
105. On a scale of 1 to 10, where 10 is "very attractive" and 1 is "extremely unattractive," how would rate client #1's overall appearance to you?
106. If client #1 represents a couple or group, rate each individual's overall appearance to you on a scale of 1 to 10, where 10 is "very attractive" and 1 is "extremely unattractive":

107. About how long, in minutes, did you spend with client #1?
108. How much did client #1 pay you, including any tips?
109. Was client #1 a regular client of yours?
110. How did client #1 first contact you?
    - ❏ email/Internet
    - ❏ word-of-mouth
    - ❏ telephone
    - ❏ face-to-face
    - ❏ referral from another provider
    - ❏ other
111. If you selected "Other," please specify:
112. What city and state did your meeting with client #1 take place?
113. Did your meeting take place in a hotel room?
114. Where did your meeting take place?
115. Did you provide a massage to client #1?
116. Did another provider assist you in your meeting with client #1?
117. Did you kiss client #1 on the mouth but without tongue?
118. Did you kiss client #1 on the mouth with your tongue (i.e., "French kiss")?
119. Did you and client #1 have vaginal sex?
120. Was a condom used?
121. Whose idea was it to wear a condom?
122. Did you perform oral sex on client #1?
123. Was a condom used?
124. Whose idea was it to wear a condom?
125. Did client #1 perform oral sex on you?
126. Did you have anal sex?
127. Was a condom used?
128. Whose idea was it to wear a condom?
129. Did client #1 ever physically assault you?
130. Were you verbally insulted or verbally assaulted?
131. If you have been assaulted in any way, do you plan to report these assaults to the authorities?

[Each questions was then repeated for Clients #2–#5]

Conclusion

I want to thank you for agreeing to participate in this interview. As stated in the beginning, we want to assure you that your answers will be kept confidential. NO ATTEMPTS WILL BE MADE TO IDENTIFY OR CONTACT YOU AFTERWARDS.

Soon, after all the data is collected, we will begin analyzing the answers to this survey. We will send you an email telling you that the results are online. Until then, please feel free to contact me by email (scott_cunningham@baylor.edu <mailto:scott_cunningham@ baylor.edu>) or by telephone (254-710-4753) if you have any questions regarding your participation in this study.