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PORNOGRAPHY AND SOCIAL ILLS: EVIDENCE FROM THE EARLY 1990S

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Beginning from the hypothesis that private post office boxes accommodate consumption of pornographic magazines by lowering some aspects of the cost (risk of social stigmatization) associated with the purchasing of such items, I demonstrate that a positive correlation between the abundance of such boxes and the subscription rate to *Penthouse* magazine across markets in the United States can be observed. I then proceed to estimate the effect of pornography on violent sex crimes and family instability, with and without using P.O. Box availability as an instrumental variable. Results suggest that unobservable population characteristics severely bias upward the estimated harmfulness of adult magazines. My OLS estimates imply, like several previous studies, that consumption of pornography contributes to both higher frequencies of rapes and divorces. When instrumental variables are employed, however, the correlation between rapes and pornography turns negative while the statistical significance of the coefficient for pornography on the rate of divorces disappears.

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I. Introduction

Debates abound over whether the wide availability of pornographic materials contributes to rises in various social ills such as sex crimes and instabilities within

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families. Free speech proponents point out that legalization of pornography was followed by a marked drop in sex crimes in many European countries (see, for instance, Kutchinsky 1973 and Kutchinsky 1991) as well as in Japan (Diamond and Uchiyama 1991). Opponents of pornography, on the other hand, cite a number of experiments by psychologists, which suggest that viewing hardcore pornography tends to instigate violent thoughts and aggression (Baron and Bell 1977, Malamuth and Check 1980, Meyer 1972, and Zillman 1971). In addition, a number of studies have uncovered what appears to be a positive correlation between adult magazine circulation and the number of reported incidences of rape (Baron and Straus 1984, 1987, and Scott and Schwalm 1988a). It is not hard to argue, however, that evidence from neither side is sufficiently compelling. While casual observations from foreign countries and U.S. cross-sectional studies suffer from the lack of controls on a host of confounding factors, results from experiments in psychological laboratories seem to have little bearing on the true effect of pornography in real societies.

The main difficulty in drawing a causal relationship between consumption of pornography and social problems such as crime in real data is that a large number of unobservable characteristics potentially cause serious estimation biases. If one hypothesizes, for instance, that an individual's violent tendency is positively correlated with his taste for hardcore pornography, then an empirical observation that areas where sales of adult magazines are large tend to have higher crime rates does not necessarily mean pornography instigates crime. It could easily be the case that the true cause behind the high rate of crime is the higher average violent tendencies of individuals living in that particular area. Since there are no good controls for such tendencies, their effects in an OLS regression are manifested in the coefficient for pornography sales thus making adult magazines appear to be more harmful than they actually are.

The main objective of this paper is to investigate whether the positive correlation between rapes and the circulation of sex magazines across U.S. markets (a result found in a number of earlier studies) persists when a standard econometric procedure for dealing with unobservable characteristic bias (i.e., instrumental variable analysis) is employed. I propose the following instrumental variable: the number of post office boxes (P.O. Boxes) per household in each metropolitan statistical area (MSA). This instrument relies on my postulate that pornography is a highly tabooed issue in many communities. Consequently, an important cost most individuals must consider when deciding how much pornography to consume is the possible embarrassment that could arise if other people find out about such personal purchases. One way of reducing this risk is by receiving pornographic material through private, semi-anonymous post office boxes. Delivery through

such channels guarantees confidentiality, since it eliminates the possibility of family, friends, or neighbors inadvertently discovering the material during the process of home delivery. The availability of post offices boxes, however, varies significantly from region to region.[1] It seems plausible, therefore, to hypothesize that areas in which post office boxes are abundantly available will on average tend to have higher levels of pornography consumption. Because one would rarely think of the availability of such postal services as playing a direct role in the crime production function nor be systematically correlated with certain unobserved characteristics of the population (such as average violent tendencies), if the aforementioned positive correlation can be empirically demonstrated then the availability of post office boxes may be considered a candidate instrumental variable for estimating the effects of pornography on various social problems.

Below, I first survey the literature on the social effects of pornography. This is followed by a short discussion on my hypothesized relationship between post office box rentals and the ease of purchasing adult magazines. It is then demonstrated that a positive correlation between the abundance of post office boxes and subscriptions to pornographic magazines can be observed in real data. Since the rate of subscriptions and single-issue purchases are strongly correlated, a positive correlation between the availability of post office boxes and overall purchases (subscriptions plus single issue purchases) is also observed. Throughout, I control for the number of commercial mailbox renting agencies (CMRA's) operating in each market. I do not, however, find a persistent positive correlation between the number of CMRA's and consumption of pornography. This result, I believe, is because CMRA's can only profitably enter into markets where postal services are unusually scarce. Hence, although their presence helps ameliorate shortages in postal services, it signifies neither the abundance nor the sufficiency of such facilities. See the discussion in Section V for further elaboration on this point. I then proceed to investigate the relationship between the rate of consumption of pornography and occurrences of sex crimes. Controlling for various local conditions, OLS estimations suggest that a one percent increase in *Penthouse* magazine household coverage significantly contributes to around six to seven additional forcible rapes per 100,000 persons. When the availability of post office boxes as well as other indicators for postal service quality are used as instruments in a two stage least squares (2SLS) estimation, however, one additional coverage percentage leads to a statistically significant *reduction* of around forty to fifty

[1] Via a telephone interview with a staff at the Evanston post office, I learned that the number of P.O. Boxes available at post office branches was determined by a centralized demand forecast. The most recent survey of demand for such services was in the 1960s.

forcible rapes per 100,000 residents. My results therefore suggest that unobservable characteristics in the population seriously bias OLS estimates. In addition, the direct effect of pornographic magazines, at least in the early 1990s, did not appear to be as detrimental to society as some may have earlier believed.

II. Overview of the literature

Prior to the early 1970s, very little was known about the pervasiveness and possible social effects of pornographic materials within the United States. In the late 1960s the President's Commission on Obscenity and Pornography was dispatched to investigate adult entertainment and its possible harmfulness. The release of the Commission's findings did little to calm disagreements regarding the censorship of such media, and intense debate continued throughout the 1970s and 80s. This section first summarizes the main findings of the President's Commission. It then goes on to describe further studies that have been conducted subsequent to the release of the Commission's report.

A. The President's Commission's findings

The Commission's main findings were that pornography was widely consumed by both men and women as early as the age of 15. Opinions about the benefits and harms of such products varied. No evidence was found that pornographic materials contributed to a higher likelihood of criminal activity or negative attitudes toward women. Statistics reported below were summarized from Wilson (1971) (the author, W. C. Wilson, being the Executive Director of Research for the U.S. Commission on Obscenity and Pornography).

Exposure

The percentage of young adults who had voluntarily been exposed to pornography varied between 70 and 90 percent, depending on the different studies the Commission surveyed. Perhaps the most reliable statistics were obtained from interviews of approximately 2,500 adults. According to this nationally representative survey, 84 percent of men and 69 percent of women had been exposed to pictorial or verbal depictions of human sexual activities. Persons who were young, more educated, socially and politically active, and had more frequent contact with other types of media such as books, magazines, and movies were more likely to have consumed pornography. Three quarters of the male subjects had been exposed

before age 21 and one half before 18. Female subjects tended to be exposed a couple of years after the men, on average.

Opinions

Both positive and negative attitudes toward pornography were reported in the survey. Some people believed that adult material provided entertainment value, useful information about sex, and improved sexual relations between married couples. Negative opinions, on the other hand, included the view that pornography encouraged sex crime and the deterioration of morals.

Effects

The President's Commission considered various empirical studies of adult and juvenile criminals. Contrary to expectations, adult sex offenders in general tended to have significantly *less* experience, when compared to non-offenders, with explicit sex materials. When data on younger criminals were considered, there were no distinguishable differences between the amount of exposure for delinquents and non-delinquents.

The Commission also obtained data from Denmark where significant legal changes greatly reduced government restrictions on adult publications in the late 1960s. Estimations on this natural experiment showed a sharp decrease in sex crimes (of between 30 to 40 percent) following the deregulation (Ben-Veniste 1971). In view of such empirical findings, the Commission concluded that it was unlikely pornography had any significant causal effect on increasing criminal activity.

B. Subsequent research findings

As mentioned earlier, the report released by the President's Commission did not settle the heated debate over the effect pornography had on society. Below, I survey a number of subsequent research findings that appear to contradict the conclusions put forth by the President's Commission.[2]

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[2] One study I exclude from the survey below is that of the Attorney General's (Edwin Meese) Commission during the Reagan presidency (United States Department of Justice 1986) since it is widely regarded to be "politically, not scientifically constituted … (and) primarily composed of nonscientists who did no research of their own and commissioned none" (Diamond and Uchiyama 1991, p. 1).

Findings from laboratory experiments

As an alternative to comparing consumption patterns of criminals and non-criminals, a number of psychologists have attempted to study the effect of pornography on individuals by conducting controlled experiments in laboratories. Although results are somewhat mixed, researchers found that under specific conditions exposure to certain types of pornographic media can instigate thoughts of violence or sexual aggression. Some examples of research papers in this category are Baron and Bell (1977), Malamuth and Check (1980), Meyer (1972), and Zillman (1971).

Cross-sectional studies

Another method researchers have employed to investigate the social effects of pornography is to study the correlation between circulation of pornographic magazines and the rate of occurrences of specific sex crimes across regions. Among the most frequently quoted results are a series of research articles published by sociologists Larry Baron and Murray Straus (e.g., 1984, 1987; see also Baron, Straus and Jaffee 1988). Theorizing on the causes of rape, Baron and Straus hypothesize that pornography contributes to higher rates of sex crimes because it provides cultural support for violence and weakens conservative norms regarding sex. Using state-level circulation data for seven adult magazines, Baron and Straus find a significant positive correlation between circulations and rape rates. To address the problem of biases arising from unobservable confounding factors in the population, the authors construct various indices aimed at measuring variation in violent tendencies and gender inequality across states. The positive correlation between sex magazine circulations and rape rates were found to persist even with the additional controls. A number of subsequent studies were carried out to confirm the basic findings of Baron and Straus (1984). Using a different set of adult magazines and independent controls, Scott and Schwalm (1988a) find a similar relationship between rape rates and adult magazine circulations. However, they fail to find an analogous correlation between rapes and the presence of adult movie theaters (Scott and Schwalm 1988b). More recently, Gentry (1991) investigated this relationship at the MSA level. Using a smaller subset of adult magazines and relatively fewer controls, she found the correlation between circulations and rape rates to be less robust. More specifically, the coefficient for the circulation variable failed to achieve statistical significance under a number of specifications. The table below summarizes some basic findings of some of the studies just mentioned.

Table 1. A summary of findings from previous studies

Study	Dependent Variable	Independent Variable	Corr	Multiple Regression			
				Coefficient	Magazines	R^2	Controls
Baron & Straus (1984)	Rapes/100,000 population (1980 State-level data)	Sales/100,000 population (1979 State-level data)	0.63**	6.99**	*Chic, Club, Forum, Gallery, Genesis, Hustler, Oui, Playboy*	0.83	Other crime rates, Status of women index, % Residents in MSA, % Black, % Poverty, % Male aged 18-24, Sex ratio for ages 15-24
Baron & Straus (1987)	Rapes/100,000 population (1980-82 State-level data averaged)	Sales/100,000 population (1979 State-level data)	--	1.05**	*Chic, Club, Gallery, Genesis, Hustler, Oui, Penthouse, Playboy*	0.83	Income inequality, Legitimate violence index, Social disorganization index, % Black, % Single male 15+, % Age 18-24, % Residence in MSA, % Male, % Unemployed, Gender inequality index
Scott & Schwalm(1988)	Rapes/100,000 population (1980 State-	Sales/100,000 population (1982 State-	0.54**	--	*Cheri, Club, Club International, Gallery, Genesis,*	0.64	% Residing in MSA, % Poor, % Non-white, Alcohol consumption,

Table 1. (Continued) A summary of findings from previous studies

Study	Dependent Variable	Independent Variable	Corr	Multiple Regression Coefficient	Magazines	R^2	Controls
	level data)	level data)			*High Society, Hustler, Oui, Penthouse, Playboy*		Status of women index, Circulation of non-erotic magazines, Rates for other types of crimes
Gentry (1991)	Rapes/100,000 population (1979-81 MSA-level data averaged)	Circulation/ household (1980, 1981, and 1983 depending on the magazine, at the MSA level)	0.25**	0.04	*Forum, Penthouse, Playboy*	0.60	Divorce rate, Population growth, Log population, % Age 18-34, Occupational sex-segregation index, % Below poverty level, Income inequality

Note: Double asterisks signify statistical significance at the five percent level.

III. Post office box scarcity and the consumption of pornography

The central hypothesis behind the empirical estimation in this study is the proposition that increased availability of post office boxes positively impacts the consumption rate of adult magazines without directly interfering with unobserved variables that may affect criminal activity. If this proposition were to be plausible, at least two prerequisites seem indispensable; that the scarcity of such postal services varies across the country and that increased availability of post office boxes reduces certain aspects of the cost (risk of social stigmatization) associated with the acquisition of pornographic materials.

I was unable to find any pre-existing regional indices of postal-service scarcity. However, a quick Internet search uncovered some anecdotal evidence suggesting that competition for P.O. Boxes in particular areas is exceptionally severe.[3] In 1999, for instance, the United States Postal Service (USPS) proposed that a set of stricter regulations be imposed on operators of CMRA's (see Merritt 1999). Subsequent popular opposition to this new law brought to light numerous complaints regarding many USPS services, including the shortage of private mailbox availabilities in some neighborhoods. Apparently, a long waiting list for a private box at the local post office was an issue of notoriety in some communities (see Bovard 1999 and Justin 1999, for instance; Domingue 1995 and Postal Rate Commision 1996 provide some earlier examples).[4,5,6,7] Indeed the very fact that a number of CMRA chains (such as Mailboxes Etc., Postal Annex, and PostNet) are thriving in many cities across the country is a testament to excess demand for mailboxes unmet by the

[3] Many of the news articles I found on this subject are collected on the *PostalWatch* website: http://www.postalwatch.org.

[4] In the July 8, 1999 issue of *USA Today*, James Bovard wrote: "Private mailbox services arose during the 1970s, when some people were told they would have to wait years for a post-office mailbox."

[5] The following is an excerpt from an article written by Tom Justin in the online magazine *HomeOfficeMag.com* on July 1, 1999: "I tried to obtain a P.O. Box at the two nearest post offices to my home. None were available. The postal employees I spoke with wouldn't place me on a waiting list, nor could they give me an estimate as to when I might be able to get a box."

[6] In the news article from the *Los Altos Town Crier* describing reported post office box thefts at the Los Altos Post Office, a resident interviewed explained that she rented a private box from the Los Altos Post Office because the waiting list at the Palo Alto Post Office was too long.

[7] In the testimony before the Postal Rate Commission, it was reported that the post office serving the town of Middleburg, VA (a town of approximately 600 residents) had a P.O. Box waiting list of about 15 to 20 prospective customers.

USPS. The reason for this excess demand may have been caused by either inaccurate forecasts or a surge in demand for P.O. Boxes by small businesses (that could have crowed out private rentals). Summary statistics that will be presented later show that there is in fact significant variation in the abundance of post office boxes across MSA's. The width of the 95 percent confidence interval for the average number of boxes per household was approximately 0.4. The mean was 0.2 (see Table 2 in Section IV for further details).

It is probably nearly impossible to find direct evidence supporting the claim that renting a post office box reduces the costs associated with the consumption of pornography. Records of mail passing through private P.O. Boxes are highly confidential. Evidence supporting such a claim is therefore necessarily indirect. Having noted this constraint, I find the above assertion believable for the following reason. One of the benefits from owning a private mailbox that is most frequently stressed is the privacy it affords. The USPS website providing information about renting a private mailbox suggests that the box can be used to "(receive) important mail that is for your eyes only."[8] Although concrete examples of postal items that demand high levels of privacy are rarely provided, pornographic materials seem like reasonable candidates to be near the top of the list. The crucial test for this assertion will appear in Section V where I investigate whether areas with greater numbers of P.O. Boxes per household tend to have higher subscription rates to hardcore pornographic magazines. The findings appear to support my hypothesis.

Besides lowering potential costs (risk of social stigmatization) of subscribing to adult magazines, the proliferation of P.O. Boxes provides an additional avenue for advertisers, possibly of adult entertainment, to target potential new customers. Those of us who receive inexorable junk mail can certainly testify of the extent to which mailboxes are exploited for commercial purposes. If extra advertisement is generally associated with more consumption, then this advertisement effect may also positively impact subscriptions to pornographic magazines in locations where P.O. Boxes are widely available.[9]

IV. Data sources

The empirical study in this paper draws on various sources for data. Statistics on the circulation of adult magazines were taken from surveys conducted by the

[8] http://www.usps.com/receive/businesssolutions/poboxrentals.htm (accessed September 16, 2004).

[9] This assertion clearly applies for all types of magazines that advertise; not only pornographic magazines.

Audit Bureau of Circulations (ABC). I focus on the circulation of *Penthouse* magazine in the year 1991. The reasons for this choice are fourfold. First, *Penthouse* is the most sexually explicit among all magazines for which circulation data is available at the MSA level (i.e. *Penthouse* and *Playboy*). Second, in previous studies such as Baron and Straus (1984), it has been shown that the circulation rates of hardcore pornographic magazines are strongly correlated. Hence, we can probably assume that the relative circulation rates of *Penthouse* are also reasonable proxies for consumptions of other sexually explicit magazines (e.g., *Hustler*) as well. Third, the year 1991 is among the few years that *Penthouse* made available its circulation data. Finally, I intend to avoid dealing with the distribution of pornographic material through the Internet and hence need to select a year before the Internet technology became mainstream.

The United States Postal Service publishes an annual directory of zip codes and post offices. The delivery statistics section of this publication gives the number of post office boxes available at each and every postal branch in the United States (listed by state and county). I obtained the 1990 issue of this publication, and counted the number of post office boxes present in each of the roughly 300 MSA's. For information on CMRA's, I consulted the 1992 Economic Census conducted by the United States Census Bureau. Following the 1987 Standard Industry Classification (SIC), the 1992 Economic Census reports the number of private mail centers (SIC 7389 (pt.), a subclass of miscellaneous business services) operating in the United States by zip code. According to the description provided by the Census Bureau, these establishments 'primarily engaged in providing mailbox rental and other postal and mailing (except direct mail advertising) services.' Each zip code was assigned to an MSA, and the total number of private mail centers operating in each MSA was calculated.

The five MSA's with the greatest numbers of P.O. Boxes per household in 1990 are Wichita-KS, San Francisco/Oakland-CA, Santa Fe-NM, Anchorage-AL, and Bangor-ME with 0.486, 0.448, 0.401, 0.399, and 0.362 boxes per household respectively. Grand Rapids-MI, Kalamazoo-MI, Boise City-ID, Las Vegas-NV, and Danville-VA had the fewest with 0.036, 0.039, 0.050, 0.054, and 0.061 boxes per household respectively. The top ten MSA's in terms of P.O. Box availability had an average *Penthouse* household coverage rate of 1.69% while the same statistic for the bottom ten was 1.28%; the difference being statistically significant at the ten percent level[10].

Crime statistics were taken from the 1990 through 1992 FBI Uniform Crime Reports (UCR), which list the number of reported occurrences of different types of

[10] Unpaired, two-sample t-test, assuming unequal sample variances.

criminal activity by MSA. I focus on forcible rapes, since these crimes seem most likely to be effected by pornography consumption.[11] It is important to note that the UCR data contains only crimes reported to law enforcement officials, and hence understates the true number of crimes committed. Although the UCR is an imperfect measure of the true rate of crime, I chose to use this data since it is available in a convenient form and was used in all of the previous studies earlier mentioned (e.g., Baron and Straus 1987, Scott and Schwalm 1988 and Gentry 1991). In addition, Baron and Straus (1987) quote a number of studies that have shown that crime statistics from the UCR have similar regional distributions as data from other victimization surveys such as the National Crime Survey (NCS). See the *Data and Methods* section of that paper for further details. Various local conditions across MSA's were derived from the 1990 census. These characteristics include proportions of population by gender, race, age, marital status, educational attainment, and armed force enrollment. Statistics on population density and per capita income were also collected.

The circulation of *Penthouse* magazine in 1991 was about 1.3 million, roughly 1.1 million being sales in metropolitan statistical areas (data form the Audit Bureau of Circulation). Subscriptions accounted for about 22% of metropolitan sales. In each of the 316 metropolitan areas, 3,700 copies were sold on average giving a mean household coverage rate of approximately 1.3%. Jacksonville-NC, State College-PA, and Anchorage-AK had the highest coverage rates of 3.71%, 3.21% and 3.19% respectively, while Texarkana-TX, Gadsden-AL, and Provo-Orem-UT had the lowest coverage rates of 0.21%, 0.22%, and 0.38% respectively.

Table 2 presents summary statistics of some of the variables that will be used in subsequent regression analyses. Statistics on demographics are less interesting and are shown for completeness. According to the FBI, there were about 103 forcible rapes reported on average per MSA, or approximately 45 rapes per 100,000 persons. Roughly 34 post offices were operating per MSA in 1991, holding on average a cumulative of just over thirty-six thousand post office boxes. The number of P.O. Boxes per household computes to about 0.2 and there were about two post offices for every 100 square miles within an MSA. Finally, the 1992 economic census documented about eight CMRA's providing mailbox and other postal services in each market on average.

[11] The UCR does not have a separate category for 'sexual assaults.' There is a general category for 'aggravated assaults', which contains non-sexual offences. I thus chose not to incorporate aggravated assaults into the dependent variable.

Table 2. Summary statistics

Variable	Mean	SD
Demographics		
% Male	48.7	1.2
% Black	10.0	10.0
% Hispanic	6.9	13.4
% Asian	1.8	4.2
% Age 15-25	15.6	3.5
% Age under 60	61.7	3.6
% Male & never married	11.0	2.2
% Female & never married	9.2	2.2
% High school dropout	14.9	4.2
% College graduate	7.9	2.2
Average household income ($10,000s)	2.8	0.5
Per capita income ($10,000s)	1.3	0.2
Unemployment rate	16.0	4.9
% Population in the armed forces	1.0	2.8
Statistics on Postal Services		
Number of post offices	33.9	58.7
Number of PO Boxes	36089.2	74372.9
Post offices / 10,000 persons	0.9	0.8
Post offices / 100 Square miles	1.9	2.1
PO. Boxes / Households	0.2	0.1
Number of CMRA's	8.1	19.6
CMRA's / 10,000 persons	0.1	0.1
Crime Statistics		
Reported forcible rapes in 1991	103.5	142.9
Forcible rapes / 100,000 persons	44.9	23.9

V. Empirical findings

In Table 3, I provide evidence that the abundance of post office boxes encourages higher rates of pornography consumption. The main variable I use to measure the average ease in which a person can rent a post office box in a given MSA is the number of boxes per household. Obviously this is not a perfect measure since the presence of a large number of P.O. Boxes does not necessarily mean that they are

readily available for private rentals.[12] It is hoped, however, that the variable provides a sufficiently accurate approximation for the average availability of such postal services.[13] The first two columns in Table 3 focus on subscriptions *coverage* while the last three consider overall (subscriptions plus single issue purchases) *coverage*. Note that the term 'coverage' refers to sales normalized by the number of households in each MSA. Depending on specification, an additional post office box per each household in a market increases the subscription coverage by about a tenth of a percent while boosting overall coverage by somewhere between 0.7 to 1.1 percent. That more post office boxes also leads to greater single-issue purchases should not come as a complete surprise since it is likely that past subscribers are more likely to purchase single issues. In addition, one may also suspect advertisement effects, from word of mouth for instance. The F-tests of joint significance of the instruments in columns 2 and 5 yield F-statistics of 7.4 and 9.4 respectively. According to practical empirical guidelines put forth by some researchers (e.g., Stock and Watson 2002, chapter 10), an F-statistic of 10 or bigger is required in the first stage regression to guarantee that the instruments are not 'weak'. Because the F-statistics in Table 3 are on the borderline of passing this practical 'rule of thumb', readers should be aware that there is a possibility the results reported later may suffer from the weak instrument problem.

Other notable findings from Table 3 are as follows. Markets with higher proportions of the population being male, as one would expect, have higher sales of *Penthouse* magazine (although the variable is only significant in two of the five specifications). Higher percentages of African Americans significantly decrease sales in all specifications. The opposite is true, however, when one considers the effect of Asian American population on overall sales. Young people (ages 15-25) appear to have a lower than average rate of consumption for this particular adult magazine. This observation may be partially explained by legal restrictions (persons under the age of 18 cannot legally purchase pornographic magazines) or by the possibility that *Penthouse* may have a greater appeal to more mature consumers. The results suggest that bigger high school dropout rates lead to smaller sales. This robust finding is probably explained by constraints on income of low education people (i.e. they cannot afford to subscribe to or purchase many single issues of pornographic magazines). The negative and significant coefficient for the unemployment rate in a few specifications seems to support this hypothesis. The

[12] There may indeed be locations where a great number of boxes are present, but such services are still scarce for private households due to high demands for these boxes from local businesses

[13] Detailed demographics are included in all subsequent regression in hope that they will help control for differences in demand for mailbox rentals.

Table 3. First stage regression, N=227 (dependent variable is either subscription or overall coverage)

Variable	(1)		(2)		(3)		(4)		(5)	
Subs/Overall coverage	Subs		Subs		Overall		Overall		Overall	
Constant	-0.84*	(0.50)	-0.69	(0.52	-3.70	(3.02)	-5.62*	(3.03)	-6.56**	(3.13)
% Male	1.86*	(1.07)	1.14	(1.12)	6.69	(6.42)	10.34	(6.51)	12.19*	(6.74)
% Black	-0.17**	(0.05)	-0.15**	(0.07)	-1.03**	(0.30)	-1.04**	(0.39)	-0.92**	(0.40)
% Hispanic	-0.01	(0.04)	-0.00	(0.04)	-0.18	(0.24)	0.08	(0.28)	0.06	(0.29)
% Asian	0.13	(0.10)	0.15	(0.11)	0.83	(0.58)	2.19**	(0.67)	2.13**	(0.69)
% Age 15-25	-0.57*	(0.33)	-0.08	(0.39)	-7.38**	(1.98)	-6.76**	(2.30)	-6.42**	(2.33)
% Age under 60	0.02	(0.21)	0.29	(0.22)	3.30**	(1.27)	4.75**	(1.30)	4.53**	(1.31)
% Male & never married	0.95	(0.87)	0.90	(0.89)	8.20	(5.23)	5.62	(5.20)	3.72	(5.33)
% Female & never married	1.92**	(0.90)	0.89	(1.03)	4.94	(5.39)	2.58	(6.07)	4.20	(6.19)
% High school dropout	-0.63**	(0.18)	-0.46**	(0.23)	-2.92**	(1.10)	-4.57**	(1.34)	-4.30**	(1.35)
% College graduate	-1.25**	(0.40)	-0.92*	(0.49)	-2.36	(2.38)	-3.32	(2.90)	-3.74	(2.94)
Per capita income ($10,000s)	0.13**	(0.04)	0.16**	(0.04)	0.08	(0.23)	0.07	(0.24)	0.11	(0.25)
Unemployment rate	0.00	(0.00)	0.00	(0.00)	-0.01	(0.01)	-0.02**	(0.01)	-0.02**	(0.01)
% Population in the armed forces	1.35**	(0.25)	1.19**	(0.29)	5.11**	(1.49)	1.61	(1.71)	1.70	(1.71)
Population (in millions)	-0.01**	(0.00)	-0.12**	(0.00)	-0.02	(0.02)	-0.01	(0.02)	-0.01	(0.02)
Population density	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
PO. Boxes / Households	0.11**	(0.06)	0.11*	(0.07)	1.12**	(0.33)	0.86**	(0.35)	0.72*	(0.40)

Table 3. (Continued) First stage regression, N=227 (dependent variable is either subscription or overall coverage)

Variable	(1)	(2)		(3)	(4)	(5)	
Subs/Overall coverage	Subs	Subs		Overall	Overall	Overall	
8 census division dummies	No	Yes		No	Yes	Yes	
Post offices / 10,000 persons		-0.01	(0.11)			0.07	(0.06)
Post offices / 100 Square miles		0.00	(0.00)			-0.02	(0.03)
CMRA's / 10,000 persons		-0.06	(0.05)			0.45	(0.29)
R^2	0.71	0.75		0.58	0.58	0.62	
F (Joint sig. of instruments)		7.4				9.4	

Note: Standard errors are in parentheses. One and two asterisks denote significance at the five and ten percent level respectively.

presence of more members of the armed forces works to increase consumption of *Penthouse* magazine, especially the subscription rate. Finally, further controls of post office density and the presence of CMRA's do not appear to play a very important role[14], although the number of CMRA's in specification (5) is on the borderline of significantly increasing *Penthouse* magazine coverage.[15]

I now present some further elaborations on why one might expect a less robust relationship between the number of CMRA's per population and *Penthouse* magazine coverage rates. First, note that in the first stage regression, the variable whose effect we are truly trying to measure is the *availability* of P.O. Boxes for private rentals, call it x^*. The availability or abundance of such services depends on the actual number of boxes *per capita* (both provided by the USPS, x_1, and by commercial mail centers, x_2) and the level of demand for such resources, x_d. Specifically, *ceteris paribus* markets with higher demand (from small businesses, for instance) will experience higher levels of scarcity (or lower availability). Now the strength of demand for P.O. Boxes is unobserved in the data. Hence the first stage regression is of the form:

$$Coverage = f(x^*) = \alpha + \theta x^* \cong \alpha + \theta_1 x_1 + \theta_2 x_2 + \varepsilon,$$

where θ, θ_1 and θ_2 are positive coefficients. Note that demand intensity, x_d, is pushed into the error term. Recall the observation made in Section I; that CMRA's only enter markets where demand is strong. Put mathematically, this says that x_2 is *positively* correlated with x_d and hence with ε. Noting that x_d is *negatively* correlated with x^* and thus with coverage as well, we have therefore demonstrated that the coefficient θ_2 is biased downwards.

At this point, the reader may be curious as to whether the abundance of post office boxes increases circulation for other types of magazines as well.[16] Although there is no reason to suspect any privacy benefits in this case, increased avenues

[14] According to a multicollinearity diagnostic test, the VIFs for each and every mailbox-availability variable does not exceed 6, suggesting that collinearity is not a serious problem.

[15] As to why it may be reasonable to use the number of CMRA's operating in each MSA as a control variable (instead of the total number of boxes available for rental), consider the following. Assume β_{USPS} and β_{CMRA} are the 'effects' of an additional mailbox, belonging to the USPS and a CMRA respectively, on the average consumption of pornography. In addition, let the *average* number of boxes available for private rental at a CMRA equal *c*. Then, the total effect of mailboxes on consumption of adult material equals $\beta_{USPS} \cdot [\#P.O.Boxes] + \beta_{CMRA} \cdot [c \cdot (\#CMRAs)]$, which can be written as $\beta_{USPS} \cdot [\#P.O.Boxes] + \tilde{\beta} \cdot [\#CMRAs]$, where $\tilde{\beta}$ is simply β_{CMRA} multiplied by a constant, i.e. $\beta_{CMRA} \cdot c$.

[16] I thank one of the anonymous referees for this interesting suggestion.

for targeted advertisements may lead to higher magazine coverage rates in MSA's with a greater number of P.O. Boxes per household. Table A1 in the appendix reports results from regressions parallel to those reported in Table 3 but instead using the coverage of four other magazines: *AutoWeek*, *Discover*, *Four Wheeler*, and *Flower and Garden*. These four magazines were chosen because their circulation information for 1990, 1991 or 1992[17] was available from the ABC's website (the circulation for other more popular magazines such as *Time* and *Newsweek* had already been updated for much more recent years). In only one out of the four regressions, namely the regression for *Discover* magazine, is the variable for P.O. Box abundance positive and statistically significant.

The central findings of this paper are reported in Table 4, where OLS and 2SLS[18] estimations using the rate of forcible rapes (reported cases per 100,000 persons) in each MSA as the dependent variable are contrasted.[19] OLS results suggest that greater sales of *Penthouse* contribute to a slightly higher rate of sex crimes. This finding supports the research of Baron and Straus (1984 and 1987) and Scott and Schwalm (1988a)[20] but is inconsistent with the more recent estimates in Gentry (1991). While my regressions use the same unit of observation as Gentry (1991) (i.e. the MSA), there are many possible reasons that could explain why I find a significant relationship between rapes and adult magazine circulations while Gentry (1991) fails to do so. First, I consider the circulation data for only one magazine, namely *Penthouse*, while Gentry (1991) includes data for other less sexually explicit publications such as *Playboy*. Second, the set of independent controls in the two studies are not identical. I include in my study detailed racial statistics as well as average educational attainment while Gentry (1991) does not.[21]

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[17] These years were selected in order to make valid comparisons to the 1991 *Penthouse* data. I could conceivably use circulation data from other years as well, although that would require tallying up new data on P.O. Boxes in MSA's across the country (quite a labor intensive job).

[18] In all 2SLS regressions, all four variables involving postal services (in Table 3) were used as instruments together with the entire set of independent variables (save *Penthouse* circulation, that is).

[19] As pointed out by a referee, two potentially important variables left out of this regression are the rate of alcohol consumption and the quality of law enforcement. Nevertheless, as long as these two variables are *not* systematically correlated with pornography usage and P.O. Box availability, then all the coefficients of interest in this paper remain consistent (because the omissions are harmlessly pushed into the error term).

[20] All five papers mentioned here use the state as the unit of observation.

[21] To be fair, Gentry (1991) does include some controls that I do not use as well such as an index for occupational sex-segregation and population growth.

Table 4. Estimating the rate of forcible rapes using OLS and 2SLS, N=221

Variable	(1)	(2)	(3)	(4)	(5)
	OLS	OLS	2SLS	2SLS	H2SLS
Constant	-74.00	-49.42	-101.66	-193.68	-157.77
	(182.15)	(189.96)	(254.87)	(326.00)	(328.49)
% Male	257.00	246.09	340.28	495.95	441.89
	(389.12)	(409.06)	(541.36)	(678.27)	(708.23)
% Black	119.71**	103.75**	67.01*	53.78	47.87
	(18.59)	(23.58)	(34.40)	(49.38)	(38.62)
% Hispanic	31.93**	22.21	24.76	30.95	26.51*
	(14.69)	(17.08)	(20.11)	(25.42)	(17.83)
% Asian	-0.40	-62.53	51.89	88.02	93.42
	(36.26)	(43.69)	(50.99)	(96.04)	(79.05)
% Age 15-25	179.24	80.6	-165.14	-247.31	-234.84
	(126.47)	(147.38)	(228.03)	(296.08)	(293.02)
% Age under 60	74.04	45.04	187.95	286.09	261.92
	(79.39)	(54.29)	(121.51)	(194.80)	(170.68)
% Male never married	-127.48	-116.37	421.60	437.44	493.47
	(313.83)	(322.72)	(466.64)	(500.78)	(512.85)
% Female never married	-599.42*	-297.77	-403.14	-391.45	-414.50
	(328.16)	(376.36)	(447.23)	(559.16)	(518.37)
% High school dropout	-192.35**	-210.44**	-407.44**	-502.19**	-490.40**
	(67.25)	(83.15)	(106.31)	(190.22)	(174.65)
% College graduate	41.41	-163.37	-265.37	-442.60	-399.87*
	(146.80)	(187.17)	(200.46)	(300.12)	(283.99)
Per cap. income ($10,000s)	8.82	15.64	30.91	39.26*	37.26*
	(13.86)	(15.50)	(18.86)	(23.23)	(28.02)
Unemployment rate	-1.07	-0.70	-1.57**	-2.18**	-2.17**
	(0.41)	(0.48)	(0.60)	(1.06)	(1.02)
% Pop. in the armed forces	-411.53**	-314.43**	-133.12	-187.52	-157.39
	(93.56)	(105.94)	(161.99)	(160.75)	(179.24)
Population (in millions)	-1.79	-2.48**	-2.29	-2.42	-2.22**
	(1.13)	(1.23)	(1.53)	(1.77)	(1.06)
Population density	0.01	0.02**	-0.01	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)

Table 4. (Continued) Estimating the rate of forcible rapes using OLS and 2SLS, N=221

Variable	(1)	(2)	(3)	(4)	(5)
	OLS	OLS	2SLS	2SLS	H2SLS
% Coverage (*Penthouse*)	6.01	7.47*	-43.65**	-53.32*	-55.80**
	(4.16)	(4.34)	(21.21)	(31.28)	(27.70)
8 census div. dummies	No	Yes	No	Yes	Yes
R^2	0.27	0.29	0.20	0.19	.20

Note: Standard errors are in parentheses. One and two asterisks denote significance at the five and ten percent level respectively.

Finally, results in Table 4 include data for many New England MSA's, which Gentry (1991) excludes from her study.[22]

The main predictions radically change in the instrumental variable estimations. More specifically, using the availability of post office boxes as instruments a one percent increase in the magazine's coverage appears to on average decrease the number of forcible rapes per 100,000 residents by around 40 to 50 cases. A test of over-identifying restrictions *cannot* reject the null hypothesis that the instruments are exogenous. To investigate whether there are any efficiency gains from accounting for possible heteroscedasticity in the error term, I employ the heteroscedastic two-stage least squares regressions (White 1982) in column 5 (H2SLS). All conclusions remain almost identical to those in column 4, with a slight strengthening in statistical significance. If therefore one believes that the availability of post office boxes increases the consumption of pornography while not significantly affecting variables that determine the crime rate, it would seem that earlier conclusions about the harmfulness of adult magazines drawn from OLS estimations were simply byproducts of unobservable population characteristics.

[22] Gentry (1991) appears to have used data at the county level and was thus forced to exclude MSA's that did not respect county lines. All of these counties were located in New England. I did not have similar problems since all of my data were at the MSA level. The only county-level data I used was the data on post offices and the number of P.O. Boxes. Fortunately, for each post office the zip codes served by that particular branch were specified in the directory. I was thus able to match each branch to an MSA by consulting the Census Tiger files that attach an MSA code to every metropolitan zip code.

Table 5. Estimating the effect of pornography on divorce rates, N=227

Variable	OLS		2SLS		H2SLS	
Constant	13.70**	(3.13)	12.05**	(4.10)	12.09**	(4.13)
% Male	-30.10**	(6.71)	-27.18**	(8.48)	-26.22**	(8.84)
% Black	0.10	(0.39)	-0.31	(0.60)	-0.53	(0.57)
% Hispanic	0.15	(0.28)	0.06	(0.33)	-0.01	(0.29)
% Asian	-0.23	(0.73)	0.36	(1.20)	0.15	(1.01)
% Age 15-25	-4.17*	(2.38)	-6.92*	(3.70)	-8.26**	(3.82)
% Age under 60	8.12**	(1.40)	9.59**	(2.42)	9.03**	(2.68)
% Male never married	26.57**	(5.35)	29.26**	(6.64)	28.69**	(6.67)
% Female never married	-37.06**	(6.17)	-34.95**	(7.11)	-31.11**	(7.10)
% High school dropout	-3.79**	(1.38)	-5.12**	(2.35)	-5.49**	(2.21)
% College graduate	-7.19**	(3.02)	-9.90**	(3.68)	-9.10**	(4.03)
Per cap. inc. ($10,000s)	1.06**	(0.25)	1.19**	(0.29)	1.10**	(0.32)
Unemployment rate	-0.02**	(0.01)	-0.03**	(0.01)	-0.03**	(0.01)
% Pop. in armed forces	-6.77**	(1.75)	-6.21**	(2.05)	-4.39**	(1.93)
Population (in millions)	-0.05**	(0.02)	-0.05**	(0.00)	-0.05**	(0.01)
Population density	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
New England	-0.37**	(0.18)	-0.25	(0.30)	-0.32	(0.30)
Middle Atlantic	-0.58**	(0.15)	-0.50**	(0.24)	-0.56**	(0.22)
East North Central	-0.17	(0.13)	-0.22	(0.16)	-0.28**	(0.15)
West North Central	-0.16	(0.13)	-0.10	(0.22)	-0.11	(0.23)
South Atlantic	-0.06	(0.13)	-0.08	(0.24)	0.07	(0.22)
East South Central	0.04	(0.15)	0.11	(0.19)	0.10	(0.17)
West South Central	-0.13	(0.12)	-0.07	(0.15)	-0.08	(0.13)
Mountain	0.33**	(0.12)	0.39**	(0.14)	0.27**	(0.15)
% Coverage (*Penthouse*)	0.13*	(0.07)	-0.15	(0.38)	-0.23	(0.37)
R^2	0.63		0.63		.60	

Note: Standard errors are in parentheses. One and two asterisks denote significance at the five and ten percent level respectively.

Although earlier studies based on legal changes in foreign countries have suggested that pornography may work to reduce crime (e.g., Ben-Veniste 1971, Kutchinsky 1973, 1991, and Diamond, and Uchiyama 1999), this is the first study to my knowledge that produces this type of result using cross-sectional data from within the United States. In other words, all previous U.S. studies along the same lines have consistently produced positive coefficients for the circulation variable, the only difference being the level of statistical significance (see Baron and Straus 1984, 1987, Baron, Straus, and Jaffee 1988, Scott and Schwalm 1988a, and Gentry 1991).

I use the same instruments to investigate the relationship between pornography consumption and divorces in Table 5. The dependent variable in this case is the number of divorced men normalized by the MSA's population. Results once again support the hypothesis that unobservable population characteristics tend to exaggerate the harmfulness of adult magazines. While there appears to be some weak evidence that higher sales of *Penthouse* magazine are related to more divorces, any positive correlation disappears once the instrumental variables are employed (both in the 2SLS and H2SLS specifications).

An additional check on the exogeneity of the instruments is now discussed. As mentioned above, a standard chi-squared test of over-identifying restrictions cannot reject the exogeneity of the instruments. There is yet another check one may carry out to confirm the exogeneity of the instruments.[23] According to standard conditions for the validity of instrumental variable analysis, the instruments must be uncorrelated with (relevant) heterogeneity that is not observed. In our case, this condition translates into the requirement that P.O. Box availability be orthogonal to unobservable population characteristics correlated with criminal behavior. Hence, if the instruments were to be legitimate, one would expect them to have no correlation with the rate of other types of criminal activity (unrelated to pornography consumption and sex crimes). On the other hand, if one finds that P.O. Boxes per household are either proportionally larger or smaller in, say, high-crime urban areas, then the legitimacy of the instruments would fall into question. Table A2 in the appendix reports the outcomes for regressions estimating the rate of occurrence of various other crimes namely burglary, larceny & theft, auto theft, and overall non-violent crime (an accumulation of the three types of crime just mentioned).[24] In each and every case, independent variables measuring P.O. Box availability are not significantly different from zero. These results hence provide further support for the exogeneity of the proposed instruments.

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[23] I thank one of the anonymous referees for this suggestion.

[24] Although non-violent crime is not a simple sum of the three types of crimes mentioned since theft of automobiles is double counted (in larceny & theft and in auto theft).

VI. Additional tests of robustness

To test whether results in the previous section are robust to small changes in timing, I recomputed some regressions using a three-year average of rape rates (1990, 1991, and 1992) as the dependent variable. The motivation behind this exercise is to check whether errors in crime reporting in the particular year chosen for this study (i.e. 1991) produced spurious correlation in the previous regressions. Note that the independent variables were not modified. Results are reported in Table 6.

Regression coefficients using average rape rates over a three-year period appear to be quite consistent with those reported in Table 4. Simple OLS estimates suggest that a one percent increase in the coverage rate of *Penthouse* magazine is associated with roughly seven additional rapes per 100,000 persons. When using instrumental variables, however, one arrives at the opposite conclusion; that higher coverage rates are linked with fewer rapes. The coefficient is significant at the ten percent level in specification (2) but fails to be significant when additional dummies for the eight census divisions are added to the regression in specification (3) (though the sign continues to be negative). When I employ the heteroscedastic two-stage least squares method, however, the coefficient for *Penthouse* coverage regains its statistical significance at the five percent level, suggesting that there are substantial efficiency gains from adjusting for heteroscedasticity in the error term when three-year average rape rates are used as the dependent variable. These robustness checks provide further confirmation that there is little reason to believe that consumption of adult magazines instigates violent sex crimes.

VII. Conclusion

Beginning from the hypothesis that private post office boxes accommodate consumption of pornographic magazines by lowering the possible costs (risk of social stigmatization) associated with the purchasing of such items, I demonstrate that a positive correlation between the abundance of post office boxes and the subscription rate to *Penthouse* magazine across markets in the United States can be observed in real data. Because subscriptions and single-issue purchases are strongly correlated, abundance in the availability of post office boxes also leads to a higher overall readership of the magazine. Provided that the number of post office boxes per household in a market is a valid instrumental variable, I proceed to estimate the effect of pornography on two social problems, namely violent sex crimes and family instability. Without instrumental variables, estimated coefficients

Table 6. Estimations using three-year average rape rates as the dependent variable, N=221

Variable	(1)		(2)		(3)		(4)	
	OLS		2SLS		2SLS		H2SLS	
Constant	29.55	(173.91)	-30.55	(223.09)	-62.47	(267.68)	-68.88	(271.44)
% Male	82.84	(374.51)	208.79	(473.85)	241.86	(556.92)	267.65	(589.70)
% Black	122.48**	(21.59)	86.20**	(30.11)	86.23**	(40.55)	76.19**	(32.05)
% Hispanic	26.39*	(15.64)	26.77	(17.60)	32.43	(20.87)	28.79**	(14.54)
% Asian	-41.86	(40.00)	49.69	(44.63)	67.97	(78.86)	75.56	(64.39)
% Age 15-25	134.80	(134.93)	-90.73	(199.60)	-89.69	(243.11)	-113.63	(248.60)
% Age under 60	42.42	(77.17)	149.38	(106.36)	205.57	(159.95)	202.23*	(140.81)
% Male & never married	-51.34	(295.46)	361.73	(408.45)	337.13	(411.19)	382.13	(417.45)
% Female & never married	-498.56	(344.57)	-476.59	(391.46)	-555.74	(459.12)	-516.70	(422.57)
% High school dropout	-202.63**	(76.12)	-378.07**	(93.05)	-406.04**	(156.19)	-416.18**	(143.53)
% College graduate	-57.59	(171.36)	-190.22	(175.47)	-240.17	(246.43)	-253.94	(226.27)
Per cap. income ($10,000s)	10.89	(14.19)	26.07	(16.51)	28.91	(19.07)	30.18*	(22.23)
Unemployment rate	-0.82*	(0.44)	-1.48**	(0.52)	-1.86**	(0.87)	-1.89**	(0.85)
% Pop in the armed forces	-344.43**	(97.00)	-172.39	(141.79)	-233.10*	(131.99)	-201.68*	(138.06)
Population (in millions)	-2.44**	(1.13)	-2.27*	(1.34)	-2.22	(1.45)	-2.13**	(0.90)
Population density	0.02**	(0.01)	0.0	(0.01)	-0.00	(0.01)	-0.00	(0.01)
% Coverage (Penthouse)	7.45*	(3.97)	-35.35*	(18.57)	-36.87	(25.68)	-42.49**	(22.54)
8 census division dummies	Yes		No		Yes		Yes	
R^2	0.34		0.26		0.26		0.27	

Note: Standard errors are in parentheses. One and two asterisks denote significance at the five and ten percent level respectively.

suggest that consumption of pornography contributes to both higher frequencies of forcible rapes and divorces. When the availability of post office boxes are used as instruments, however, the correlation between rapes and pornography turns negative while the statistical significance of the coefficient for pornography on the rate of divorces disappears. These findings potentially reconcile two contradicting lines of research on the social effects of pornography; one that links legalization of adult material to a decline in crime in Europe and one that points to a positive correlation between crime and sales of sex magazines within the United States. My results strongly suggest that unobservable population characteristics severely bias upward the OLS estimated harmful effects of such magazines and hence wrongly attribute social ills arising from unobservable population features to sales of pornography.

Appendix

Table A1. Coverage rates for a sample of four other magazines

Variable	*AutoWeek*		*Discover*		*Four Wheeler*		*Flower& Garden*	
Total US Circulation	266,127		1,032,745		290,510		560,983	
Constant	1.80 *	(0.99)	1.44	(1.48)	1.51	(1.21)	-2.47	(2.37)
% Male	-2.62	(2.14)	-3.38	(3.23)	-2.56	(2.61)	5.94	(5.11)
% Black	0.02	(0.13)	-0.69 **	(0.19)	-0.15	(0.15)	0.19	(0.31)
% Hispanic	0.08	(0.09)	-0.11	(0.13)	-0.13	(0.11)	-0.14	(0.21)
% Asian	-0.06	(0.58)	0.57 *	(0.32)	-0.22	(0.25)	2.49 *	(1.37)
% Age 15-25	-0.31	(0.73)	-0.92	(1.11)	1.63 *	(0.87)	2.18	(1.74)
% Age under 60	-0.79 *	(0.42)	2.49 **	(0.77)	-1.24 **	(0.49)	-0.53	(0.99)
% Male & never married	2.64	(1.67)	3.12	(2.56)	0.81	(2.08)	-5.19	(3.98)
% Female & never married	-1.52	(2.01)	-2.83	(2.92)	-0.67	(2.36)	0.69	(4.81)
% High school dropout	0.24	(0.42)	-2.25 **	(0.64)	1.28 **	(0.51)	2.58 **	(0.10)
% College graduate	2.07 **	(0.92)	1.06	(1.38)	2.14 *	(1.14)	4.96 **	(2.21)
Per cap. inc. ($10,000s)	-0.16 **	(0.08)	0.19	(0.13)	0.18 *	(0.10)	-0.09	(0.18)
Unemployment rate	0.01 **	(0.00)	-0.01	(0.00)	-0.00	(0.00)	-0.00	(0.01)
% Pop. in the armed forces	0.83	(0.53)	-1.79	(0.84)	1.28 *	(0.65)	-0.09	(1.26)
Population (in millions)	-0.00	(0.01)	-0.03 *	(0.01)	-0.01	(0.01)	0.00	(0.01)
Population density	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
PO. Boxes / Households	0.08	(0.12)	0.72 **	(0.19)	-0.17	(0.15)	-0.45	(0.29)

Table A1. (Continued) Coverage rates for a sample of four other magazines

Variable	*AutoWeek*		*Discover*		*Four Wheeler*		*Flower& Garden*	
8 census division dummies	Yes		Yes		Yes		Yes	
Post offices/								
10,000 persons	0.00	(0.02)	-0.06**	(0.03)	-0.00	(0.02)	0.05	(0.05)
Post offices/								
100 Square miles	-0.01	(0.01)	0.01	(0.01)	0.01	(0.01)	-0.44**	(0.02)
CMRA's/10,000 persons	-0.06	(0.09)	-0.14	(0.14)	-0.01	(0.11)	0.30	(0.21)
R^2	0.16		0.67		0.19		0.18	

Note: Standard errors are in parentheses. One and two asterisks denote significance at the five and ten percent level respectively.

Table A2. Regressions for the rate of other, unrelated crimes (per 100,000 persons)

Variable	Burglary	Larceny & theft	Auto theft	Non-violent
Constant	2661.2 (2664.0)	16953.2** (7176.5)	-589.7 (1630.7)	32947.4**(10535.1)
% Male	-2301.5 (5817.1)	-26754.8* (15670.9)	1968.3 (3560.9)	52284.9**(22734.0)
% Black	1779.4**(334.7)	3033.5**(901.6)	833.7**(204.9)	6743.7**(1354.1)
% Hispanic	376.2 (242.7)	1933.8**(653.7)	290.7*(148.6)	4000.1**(1005.4)
% Asian	-510.5 (552.3)	-462.2 (1487.8)	-431.2 (338.1)	2304.5 (2339.2)
% Age 15-25	2663.1 (2136.9)	2888.7 (5756.7)	-1867.7 (1308.1)	15661.0*(8480.8)
% Age under 60	-1330.0 (1053.1)	-1060.2 (2837.0)	-351.8 (644.7)	-2100.2 (4433.5)
% Male & never married	937.8 (4392.8)	12124.6 (11834.0)	1504.2 (2689.1)	24013.6 (18236.5)
% Female & never married	-5254.7 (5523.4)	-12677.7 (14879.5)	2432.5 (3381.1)	-45907.1** (21607.7)
% High school dropout	-567.4 (1124.3)	-7442.3**(3028.8)	-117.9 (688.2)	-16067.4**(4620.9)
% College graduate	1237.9 (2440.7)	-4290.1 (6575.1)	-1073.8 (1494.1)	-11481.5 (10381.2)
Per cap. income ($10,00)	45.7 (209.5)	131.3 (564.5)	275.1**(128.3)	976.4 (867.1)
Unemployment rate	-8.9 (6.7)	2.3 (18.0)	-7.8* (4.1)	-12.6 (27.5)
% Armed forces	-2694.7* (1476.4)	-4053.4 (3977.3)	-813.2 (903.8)	-1397.2**(5974.6)
Population (in millions)	-49.9** (16.2)	-137.0** (43.7)	-12.5 (9.9)	-138.7**(69.2)
Population density	0.3 (0.2)	0.7 (0.4)	0.2**(0.1)	1.1* (0.7)
PO. Boxes / Households	320.8 (393.9)	208.7 (1061.1)	-323.5 (241.1)	-596.7 (1549.1)
8 census div. dummies	Yes	Yes	Yes	Yes
Post offices/10,000 pop.	-62.0 (59.9)	-171.5 (161.3)	-17.1 (36.7)	-156.5 (230.1)
Post offices/100 Sq. miles	22.2 (23.1)	1.0 (62.3)	2.3 (14.2)	-37.2 (86.3)
CMRA's/10,000 persons	274.9 (237.4)	306.3 (639.5)	116.6 (145.3)	806.1 (980.1)
R^2	0.46	0.47	0.49	0.57

Note: Standard errors are in parentheses. One and two asterisks denote significance at the five and ten percent level respectively.

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