The construction of morals☆

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ABSTRACT

When do policies generate expressive or backlash effects? Recent economic models suggest that where a proscribed activity is prevalent, permissive laws liberalize attitudes toward partakers while increasing utility. The opposite occurs in communities where the proscribed activity is rare. To test these predictions, we randomize data entry workers to transcribe newspaper summaries of liberal or conservative court decisions about obscenity. We find that liberal obscenity decisions liberalize individual and perceived community standards and increase utility. Yet religious workers become more conservative in their values, identify as more Republican, view community standards as becoming more liberal, and report lower utility. Workers update beliefs about the prevalence of sexual activities differently in response to liberal or conservative decisions. These results provide causal evidence for the law having indirect social effects that may amplify or attenuate deterrence effects and suggest that legitimacy of law can affect utility and self-identification.

1. Introduction

Efforts to shape moral values through the law abound in history. Policies on areas of abortion, alcohol, same sex relationships, sex education, and free speech are commonly justified in terms of values, whether to protect moral standards or to promote civil liberties and social justice. The law's expressive power, separately from its deterrent effects, is widely presumed to influence values (Lessig, 1995; Sunstein, 1996). Courts in particular, as arbiters of the law in the United States, are viewed to communicate normative judgments that affect deeply held beliefs. People's preferences to follow social norms (Bicchieri, 2006), together with the law's role in changing beliefs about those norms, are theorized as important mechanisms that explain law's expressive effects (Dharmapala and McAdams, 2003). At the same time, a rich literature argues that legal decisions are themselves influenced by social trends and preferences and depending on the context, can inspire backlash against the law (Klarman, 1994, 2005).

Despite plentiful theoretical and popular discussion, little is known empirically about the effects of law on moral values. In our paper, we experimentally examine the expressive effects of court-made obscenity law on sexual attitudes and perceived

norms. Because of its emotional salience, obscenity law enables us to differentiate expressive from deterrent effects. In the short time frame of our experiment, the role of material penalties is trivial.

Few areas of law are as salient and as directly predicated on morality as obscenity law, which restricts acts or expressions deemed to be offensive. History has shown that U.S. obscenity cases are decided mainly on the basis of moral harm (Linz et al., 1995; Koppelman, 2005). Norms are endogenously codified in U.S. obscenity law through the Supreme Court's *Miller* test, which relies on community standards to determine whether or not an expression is obscene. Since existing norms guide obscenity decisions in courts, it is likely that more liberal sexual attitudes predict more liberal obscenity laws across jurisdictions (Chen and Yeh, 2013a). One community may find homosexuality obscene, when homosexuality is not openly prevalent in that community, while another may deem it acceptable where homosexual people are not rare. To disentangle cause and effect in the legal construction of morals, we run an experiment.

We recruited 600 data entry workers from the U.S. on Amazon Mechanical Turk to transcribe newspaper reports, which we randomly assign to be about a liberal or conservative obscenity decision or a placebo. We measure values by surveying all workers immediately after the treatment and some workers immediately before on their attitudes about sexual relationships, sex education, pornography, and their political party affiliation. This study design, which focuses on changes in attitudes and beliefs, allows us to identify the law's expressive effects without the problem of confounding deterrence effects. The obscenity decisions do not impose material penalties for merely expressing a particular attitude.

To theoretically motivate our analysis, Section 2 provides the intuition of a model by Benabou and Tirole (2011) of how law affects morals. Individual behaviors are determined by a person's intrinsic motivations (values), extrinsic incentives, and social norms. One seeks honor or avoids stigma by signaling one's values relative to the perceived social norm. Laws provide information that people use to update their beliefs about norms. For example, because of *Miller's* community standards test, a decision that outlaws pornography as obscene may cause people to believe that pornography is offensive and less accepted in society. It may also cause people to believe that pornography is more prevalent in society because pornography was deemed to be a problem by the court. Laws therefore can affect individuals' actions not only through traditional deterrence (formal sanctions) but also through perceived norms. Depending on the underlying norms of a community, a law may have an expressive effect, which we define as people adopting moral views *in favor* of what the law values, or a law may have a "backlash effect," which we define as people adopting moral views *against* what the law values. We present the conditions under which either expressive or backlash effects are likely to occur.

We find that court decisions on obscenity have an expressive effect on average – they lead to responses in favor of the values promoted by the law. Exposure to liberal obscenity decisions, which reflect more sexually permissive community standards according to the *Miller* test, increases workers' likelihood of displaying more sexually liberal attitudes. Exposure to conservative decisions reduces the likelihood of displaying sexually liberal attitudes. We rule out the possibility of deterrence effects or self-reporting effects. We find no changes in self-reported sexual behaviors.

To examine the mechanism for the law's expressive effects, we measure its impacts on individual and community standards of morality. In our experiment, one group was asked to report their own standards of morality while another group was asked to estimate the other workers' standard of morality and was offered payment incentives for accuracy. We also asked one group to report their own sexual behaviors and another group to estimate the prevalence of the other workers' sexual behaviors with incentive pay for accuracy. This design allows us to test for a belief-updating channel that could explain law's expressive effects according to the model. Exposure to liberal obscenity decisions caused more sexually liberal attitudes and increased the perceived prevalence of sexually liberal attitudes.

Historically, one-half to two-thirds of appellate obscenity cases in the past 50 years have been related to homosexuality (Chen and Yeh, 2013b). U.S. society has typically been more tolerant of lesbian women than of gay men, with the latter group more likely to be socially stigmatized and more likely to experience violent crimes (Herek, 2009). We find different responses depending on whether obscenity decisions made references to gay or lesbian depictions. While liberal obscenity decisions making no reference to homosexuality had expressive effects, obscenity decisions that specifically allowed lesbian depictions resulted in a backlash of less acceptance of homosexual sex. We consider whether women respond differently from men to decisions that allow lesbian materials, but recognize that more data are needed.

Under the model, either expressive or backlash effects arise depending on the norms of the community. Behavioral or attitudinal responses to policies have been observed to vary by group ideology (Costa and Kahn, 2010), historical and economic experiences (Alesina and Fuchs-Schündeln, 2007), or how prominent an issue is to a community before the law's enactment (Kotsadam and Jakobsson, 2011). We examine the attitudinal mechanism for differential responses. In particular, we look at heterogeneous effects by religiosity and geography, where the community norms are likely to differ. Among workers who reported more frequent attendance of religious services, liberal obscenity decisions led to more conservative sexual attitudes, more liberal estimates of community standards, and stronger identification with the Republican Party. Liberal obscenity decisions increase worker satisfaction overall, but decrease satisfaction among religious workers, consistent with the model's predictions: agents from liberal communities feel honor for one's signal but backlash if they come from a conservative community. Conservative decisions also increased subjects' estimates, significantly so among religious workers, of the prevalence of non-marital sexual behaviors.

Prior empirical research has emphasized the role of legitimacy when laws shift public opinions in their favor (Bartels and Mutz, 2009) and when people obey the law (Tyler, 2006). That is, individuals respond to whether the law or the lawgiver reflects their attitudes and beliefs. Such results are consistent with ours and have implications for the role of legitimacy in organizations, courts, and democracies. Our experimental framework makes several novel contributions: we isolate the

attitudinal mechanism in the law's expressive effects on behavior (Chen and Yeh, 2013b), we use monetary incentives to measure belief-updating of others' moral views (community standards), we separate individual from community standards, and we measure utility.

Beyond moral values, an abundant discourse has linked provocative media with crime, gender inequality, and divorce (Dahl and Della Vigna, 2009; Kendall, 2007; MacKinnon, 1985). With expansions of broadband Internet and online intermediaries increasing access to sexually explicit materials (Edelman, 2009), governments from India to EU member states have pursued actions to prevent these materials from becoming more broadly accepted in daily life. Our findings about morality indicate a channel through which obscenity law, which often regulates these intermediaries, may have broader consequences on economic behavior.

The organization of the rest of the paper is as follows. Section 2 explains a theoretical intuition to frame our experimental analysis and provides a summary of U.S. obscenity law. Section 3 describes the experimental design and data. In Section 4, we present and discuss the results. Section 5 concludes.

2. Background

2.1. Theoretical motivation

To guide our experimental framework, this section discusses the intuition underlying a simplified model of law and norms by Benabou and Tirole (2011). We define an *expressive effect* to occur when the law causes preferences (moral attitudes) to shift toward what the law values. A *backlash effect* occurs when the law causes preferences to shift in the opposite direction of what the law values.

An individual chooses an action a to maximize the utility function:

$$U(a) = v_a a - ca + e\tilde{a} + \mu E(v_a|a)_s \tag{1}$$

An individual chooses an action a based on intrinsic motivations (values), extrinsic incentives, and social norms. One's intrinsic values v_a, distributed over the range $[v_L, v_H]$ would motivate one to take an action because one believes it is simply "the right thing to do." Extrinsic incentives, ca, are economic costs such as fines or criminal sanctions that arise in models of deterrence. Some collective action or public good benefits, $e\tilde{a}$, may also accrue. $\tilde{a}$ is the proportion in the population choosing action a. Perceptions, $E(v_a|a)_s$, are other people's or one's own perceptions of one's intrinsic value, and people use some rule s to calculate the expectation of one's intrinsic values when one takes a particular action; expectations will be correct in a rational expectations equilibrium. μ is the weight that the individual places on these perceptions.

One can experience honor or stigma from taking an action (choosing a signal) that is outside the norm. For a simplified illustration, suppose a person has a choice of two signals: to partake in high sexual activity ($a = 0$), or abstain ($a = 1$). A person partakes ($a = 0$) if the payoff satisfies the cutoff rule, whose fixed point v^* is the equilibrium social norm. Manipulating the terms so that a person is indifferent between actions $a = 1$ or 0, and holding other people's actions fixed in equilibrium, the cutoff rule for choosing between actions is:

$$v^* - c + \mu E(v_a|1)_s = \mu E(v_a|0)_s \tag{2}$$

Define the terms so that people choose $a = 1$ if $v_a > v$ and $a = 0$ if $v_a < v$, holding others' actions fixed in equilibrium:

$$\Delta(v) = E(v_a|v_a > v) - E(v_a|v_a < v) \tag{3}$$

Substitute, and the fixed point $v = v^*$ solves the equation:

$$v^* + \mu\Delta(v^*) = c \tag{4}$$

Thus, the difference $E(v_a|v_a > v^*) - E(v_a|v_a < v^*)$ in the social honor from abstaining from high sexual activity vs. partaking is a function of other people's expectations about the intrinsic values of those individuals who abstain or partake. This difference captures the *immorality* of the sexual activity.

A law affects the economic sanctions (deterrence effect) as well as shifts perceived social norms v^* (social multiplier effect). For example, suppose a law defines an expression to be obscene according to whether the average person applying current community standards would consider the expression to be prurient and patently offensive. A legal decision that outlaws contraceptives[1] as obscene may cause people to believe that contraceptives are offensive and less accepted in society, based on the law's application of community standards. People may update $E(v_a|v_a > v^*) - E(v_a|v_a < v^*)$ upwards. The crackdown may also cause people to believe contraceptives are more prevalent in society because contraceptives were deemed to be a problem by the court, which cause the perceived cutoff, v^*, to shift right.

Fig. 1 (from Benabou and Tirole, 2011) shows the mechanism. The *x*-axis displays the range of intrinsic motivations and the *y*-axis is the density. Following Benabou and Tirole, the perceived moral action is on the right-side of the *x*-axis and the

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[1] A significant history in U.S. obscenity litigation concerns Comstock laws that restricted birth control devices and materials related to contraceptives. Variations in Comstock statutes have been linked to the subsequent availability of the birth control pill and trends in fertility (Bailey, 2010).
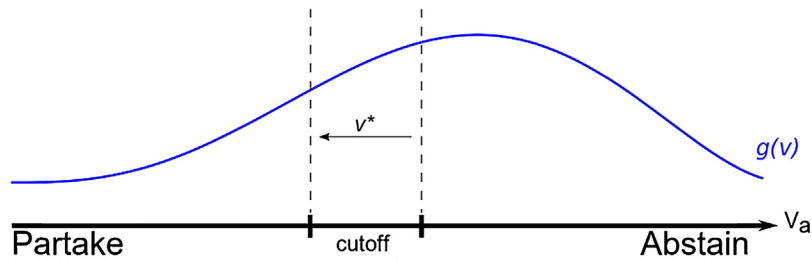
Fig. 1. Distribution of intrinsic motivations.

perceived immoral action is on the left-side. $g(v)$ is the distribution of intrinsic motivations in the population. The vertical line is the cutoff rule. Those to the right of the cut-off rule will abstain while those on the left will partake.

Across different communities, the cutoff may differ. In religious communities, the cutoff is on the left, as most people are abstaining from high sexual activity. A law has a "backlash effect," causing moral views to shift against what the law values when the cut-off rule of the group is on the left-side of the distribution. To see this, a liberal decision shifts the perceived cutoff rule to the left. The social perception of partakers falls dramatically since a large mass just to the left of the old cutoff is removed from $E(v_a|v_a < v^*)$. The social perception of abstainers also falls but not by as much. Thus $E(v_a|v_a > v^*) - E(v_a|v_a < v^*)$ increases and the morality of partaking in high sexual activity falls. In non-religious communities, the opposite occurs. Law has an expressive effect, causing people to adopt moral views toward what the law values when the cut-off rule of the group is on the right side of the distribution, i.e., when high sexual activity is prevalent.

2.2. Theory measurement

Our survey questions are designed to measure several theoretical parameters in the model. Morality is captured by $E(v_a|v_a < v^*) - E(v_a|v_a > v^*)$. Questions about the immorality of partaking in high sexual activity relate to the difference in the social perception of abstaining from high sexual activity vs. the social perception of partaking in high sexual activity. We call this quantity the individual's moral standard, because it pertains to the individual's view of others, the individual's view of what others would think if the individual partook in the activity, or the individual's view of oneself in a self-signaling framework.

The estimate of others' moral standards is what we call the community standard. It also relates to $E(v_a|v_a < v^*) - E(v_a|v_a > v^*)$, *but it is the view of others* and is incentivized for accuracy in our experiment. Questions about the prevalence of high sexual activity relate to people's beliefs about v^*. Questions about the negative externalities of high sexual activity relate to $e\tilde{a}$. The questions in the experiment test whether the law affects views about the public benefits or costs of high sexual activity.

Finally, we use a question about worker satisfaction to measure $U(a)$. Note that holding behavior fixed, those who abstain from high sexual activity will lose utility when liberal laws have an backlash effect because, even though the morality of abstaining increases relative to partaking, the social perception of abstaining decreases in absolute terms (Eq. (1)). Those who partake in high sexual activity can gain utility. Liberal laws have two competing effects on utility. On the one hand, expressive effects lower utility because, even though the morality of high sexual activity relative to abstaining increases, the social perception of high sexual activity decreases in absolute terms. On the other, the extrinsic cost of partaking has decreased, which increases utility.

2.3. Obscenity law in the United States

Obscenity law is present at several levels of government in the United States. For example, federal statutes prohibit mailing or transporting "any obscene, lewd, lascivious, or filthy" matters across state borders. Federal law also forbids selling obscene material on the Internet and restricts the broadcasting of obscene language. In addition, state and local jurisdictions may have their own laws and regulations; examples include ordinances that prohibit showing sexually explicit films in local theaters. The penalties typically involve fines or imprisonment. Prosecutions under obscenity statutes and challenges to government regulations are first heard in district courts. Here, judges and juries act as fact-finders and make decisions by applying existing laws to the specific facts of the cases. On appeal, the cases proceed to the appellate courts, where judges decide new issues of law, and their decisions become legal precedent for their respective jurisdictions.

Fundamentally, court decisions determine the bounds of obscene expressions. For a matter to be subject to an obscenity regulation, it must first be legally defined as obscene. Since 1973, whether or not something is obscene is determined by applying the Supreme Court's test from *Miller v. California*.[2] Under the three-pronged *Miller* test, a matter is obscene if:

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[2] 413 U.S. 15 (1973).

"the average person, applying contemporary community standards" finds that the matter

(1) "appeals to the prurient interest" and
(2) has "patently offensive" depictions of sexual conduct, and
(3) if a reasonable person finds that the matter
(4) "lacks serious literary, educational, artistic, political, or scientific value."[3]

Obscenity law therefore is predicated on courts' perceptions of community standards. Assuming that the adversarial system fosters fact-finding, legal decisions can reflect more complete information about values in a community. Legal decisions may also reflect the values of the courts (Linz et al., 1995), as judges often exercise discretion in interpreting the law.[4] The breakdown of moral standards and secondary effects, such as sexual violence, child sexual abuse, disease and drugs are among the harms that have been commonly cited in the U.S. to justify the exercise of police powers in restricting expressions of obscenity. Thus, legal decisions can also convey information about the prevalence of certain activities and their negative externalities.

Obscenity decisions can therefore shape social values, whether directly through information about community standards or indirectly through shifts in beliefs about the prevalence of high sexual activity. Starting from an obscenity decision about a matter such as contraceptives, people also may infer what social values are in related areas such as like sex education or divorce. Subsequent interpretation of information from the law may be heterogeneous. The literature on attitude polarization and confirmation bias (Lord et al., 1979) suggests that initial values determine how individuals vary in interpretation of the law. The model in this section provides a framework for thinking about these differences.

3. Research methodology

3.1. Court decisions

We randomize data entry workers to be exposed to newspaper paragraphs that summarized conservative or liberal obscenity decisions. A conservative court decision finds that a sexual matter is obscene; it is illegal according to a government regulation and therefore subject to penalties. A liberal decision rules that a sexual matter is not obscene and allowable; it is protected speech and the government may not regulate it.

Court-made obscenity law provides several advantages for the experimental study of the expressive or backlash effects of the law. Obscenity is an emotionally salient area of law. A significant channel by which court decisions reach individual awareness is through local media publicity (Hoekstra, 2000). With their provocative nature, court decisions about obscenity are a natural story for local newspaper coverage.[5] Using newspaper databases, Chen and Yeh (2013b) show that in the past three decades, the number of local newspaper articles about appellate court decisions regarding obscenity track the actual number of appellate obscenity decisions in their jurisdictions. This phenomenon is also consistent with the U.S. common law system, where court decisions are binding precedent (effective as law) only in their respective jurisdictions. We minimize bias from prior exposure to a case by using appellate and local court decisions, whose publicity and legal scope are regional, rather than Supreme Court decisions, which are national.

In our experiment, the economic costs of not complying with the law are trivial, allowing us to isolate the expressive effects of law from the deterrent effects. Outside the experiment, conservative obscenity decisions in the longer run may affect material incentives by making it easier to prosecute an offender or regulate obscene materials. However, criminal or financial penalties do not apply to answering survey questions about one's values. It is highly unlikely that reading an obscenity decision would change one's actual sexual behavior within the short time frame of a data entry experiment.[6] In the results section, we verify that self-reported sexual behaviors do not change in response to the law. Thus, our experiment separates the law's expressive effects and its belief-updating channel from its potential deterrent effects.

3.2. Experimental design

Data entry workers are recruited via Amazon Mechanical Turk, an online labor market intermediary.[7] The workers in our experiment arrive naturally to our setting while they are looking for very short-term, paid tasks such as entering data or

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[3] Id. at 24.

[4] For example, randomly assigned judges who were Democratic appointees were more likely to vote liberally in appellate obscenity cases than Republican appointees, even though all judges must apply the Miller test (Chen and Yeh, 2013b).

[5] See, e.g., Julia C. Mead, "Village Can Shut X-Rated Store," New York Times, Section 14LI, Column 5, June 19, 2005; Joyce Price, "'Community Standards' ruling stands; On-line porn judged by download site," The Washington Times, p. A6, February 16, 1996.

[6] The mean time spent on the data entry and survey was 25 min with a standard deviation of 13 min; the time spent was 13 and 47 min at the 5% and 95%-ile.

[7] On average, the U.S. workers on AMT are younger in age, more likely to be female, and are more educated than the general population. They are likely to be representative of internet users in the U.S., who some argue are closer to the general population in demographics than conventional subjects in university laboratory settings (Paolacci et al., 2010).

transcribing audio files. Like other employers seeking workers online, we posted a description of a transcription task that workers could accept or decline.

The natural environment of the online labor market and our randomized design lessen Hawthorne effects that may arise when people become aware that they are in a study. Even if workers become aware of being in a study, they are unaware of what the treatment condition is and unaware that other subjects receive different treatment conditions. Our randomized transcriptions also alleviate concerns that the mere exposure to any news related to sexual matters may affect survey responses by magnifying a subject's preexisting beliefs. Since all news reports about obscenity decisions, whether conservative or liberal, are about sexual matters, randomizing the court decision to be liberal vs. conservative should capture the effect of the legal outcome. We assuage remaining concerns about Hawthorne effects and external validity in Chen and Yeh (2013b), in which we analyze a series of natural experiments of obscenity law over fifty years across the U.S. and find shifts in attitudes similar to our findings in this experiment.

In our experiment here, all workers who accept the job are first required to transcribe three neutral "lock-in" images of a paragraph. This lock-in task is an effective method to reduce attrition from the job. Immediately after completing the third lock-in paragraph, workers are randomized, via stratification in the order in which they completed the task, into one of three arms of the experiment. Within each arm, workers are randomly assigned again to one of several treatment conditions involving the transcription of a fourth paragraph about an obscenity case or a placebo. The treatment and control transcription tasks are identically constructed across arms, but the survey administration differs across the arms. Fig. 2 diagrams the experimental design. The three arms of the experiment are detailed below. Appendix 1 describes recruitment.

Fig. 2 *Arm 1*. A worker randomized to Arm 1 is randomly assigned again to transcribe one of eight different paragraphs or no paragraph, for a total of six treatment groups and three control groups. The eight paragraphs are: a liberal obscenity decision (general, i.e., silent about sexual orientation), a liberal obscenity decision about a gay depiction, a liberal obscenity decision about a lesbian depiction, a conservative obscenity decision (general), a conservative obscenity decision about a gay depiction, a conservative obscenity decision about a lesbian depiction, an English placebo paragraph, or a Tagalog placebo paragraph. The paragraphs are shown in the online appendix. After transcribing, workers are immediately surveyed about their attitudes, behaviors, perceptions of U.S. sexual behaviors (prevalence of same-sex relationships, extramarital relationships, and STDs), and demographics. The third control group is not asked to transcribe a fourth paragraph and proceeds from the lock-in task directly to the survey.

Fig. 2 *Arm 2*. After completing the lock-in task, workers assigned to Arm 2 are immediately asked four questions about their sexual attitudes and questions about their perceptions of U.S. sexual behaviors (prevalence of same-sex relationships, extramarital relationships, and STDs). After this initial survey, workers are randomized to transcribe one of eight paragraphs, as in Arm 1, for a total of six treatment groups and two control groups. Upon completing the transcription, workers are surveyed again on their attitudes, behaviors, perceptions of U.S. sexual behaviors (prevalence of same-sex relationships, extramarital relationships, and STDs) and demographics.

Fig. 2 *Arm 3*. Arm 3 was designed to test for a belief-updating channel of the law's effects using incentive pay for accuracy. The survey design in Arm 3 is similar to Arm 2, except Arm 3 asks additional, incentivized questions before and after the treatment.

Immediately following the initial questions as in Arm 2 (four questions about their sexual attitudes and questions about their perceptions of U.S. sexual behaviors), workers are asked to estimate how *other* workers answered questions about U.S. sexual behaviors and are offered a payment incentive for accuracy. Workers then transcribe a fourth paragraph according to their assignment to treatment or control groups as in Arm 2. After the transcription, the workers are asked the remaining questions about attitudes as in Arm 2. The workers are next asked to estimate how other workers would answer the attitude questions with payment incentive for accuracy (see online appendix for questionnaire on perceived community standards). Then, as in Arm 2, they proceed to answer questions about their behaviors and are again surveyed on their perceptions of U.S. sexual behaviors. In addition, they are again asked to estimate what other workers would say about their perceptions of U.S. sexual behaviors and are offered a payment incentive for accuracy. Finally, they are surveyed on their demographics.

Workers receive piece rate compensation for their work and receive additional payments for completion of the experiment. The piece rate payment for each paragraph transcribed is 10 cents. A paragraph takes about 100 s to enter, so the offered payment of 10 cents per paragraph is equivalent to $3.60/h ($28.80 per day). To compare, the U.S. federal minimum base wage for tipped waiters is $2.15/h ($17.20 per day) and the federal minimum wage is $7.25/h ($58/day). An example paragraph is displayed on the first page of the external hosting site, so workers are aware of the payment before entering the study. Workers receive an additional 50 cents upon completion of the survey.[8]

Workers are incentivized to accurately report what they believe are the norms. For each question that asks workers to estimate what other workers would say about their sexual attitudes or perceptions of U.S. sexual behaviors, their incentive to estimate accurately is a $1 bonus if her estimate is within one percentage point of the correct answer. Workers are told that if multiple people provide estimates within one percentage point, then one person will be randomly selected as the winner of the bonus.

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[8] The 50 cents was paid only if the surveys were completed and the paragraph transcriptions had fewer than 100 errors.
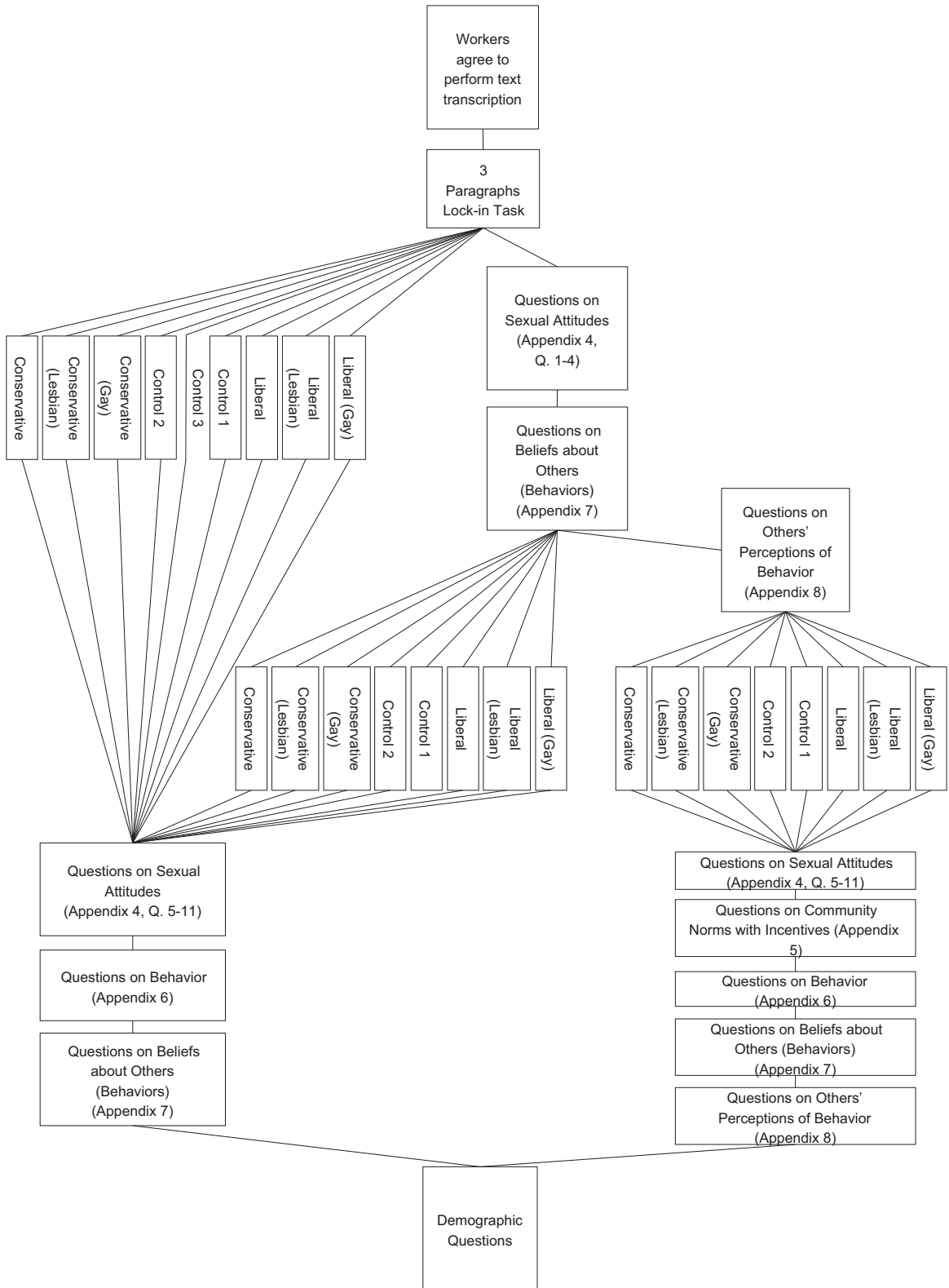
Fig. 2. Design of experiment.[9]

Table 1
Summary statistics.

	Mechanical Turk		General Social Survey	
	Mean	St. Dev.	Mean	St. Dev.
Age	31.328	10.705	46.102	17.278
Female	0.607	0.489	0.539	0.499
White	0.81	0.393	0.736	0.441
Ever divorced	0.145	0.352	0.118	0.323
Catholic	0.145	0.352	0.242	0.428
Jewish	0.013	0.115	0.015	0.120
Republican	0.197	0.398	0.318	0.466
Attend church 1+ times per week	0.182	0.386	0.261	0.440
Watched X-rated movie last year	0.452	0.498	0.247	0.431
Had casual sex last year	0.120	0.325	0.048	0.214
Had paid sex last year	0.0388	0.193	0.003	0.056
Number of partners last year	1.444	2.319	1.132	1.526
Homosexual sex is OK	0.701	0.458	0.515	0.500

Mechanical Turk N = 600. General Social Survey variables are from 2012, N = 1974. Weights are applied to GSS means.

3.3. Data and empirical specification

We conducted the experiment from January 2–6, 2013. The sample includes workers from 49 states and the District of Columbia, ages 17–73 (mean of 31 years old and standard deviation 11). A total of 645 workers began the lock-in task and 600 workers completed the lock-in task accurately. Of the workers who received random assignment (right after they finished the lock-in task), 99% completed the experiment and answered the survey questions. At the end of the survey, we ask workers for feedback about their task. 95% of workers report being satisfied to very satisfied with their work experience, and 31% were very satisfied.

A concern with any experiment is whether workers pay enough attention during the experiment. To address this, we use workers' baseline data entry error rates as a proxy for attention. For our main analysis, we use a restricted sample consisting of 600 workers who made fewer than 10 errors on the third lock-in paragraph. This excludes only 7% of the original sample. Attrition in this restricted sample was extremely low. 99.8% of these subjects completed the experiment and answered survey questions. Our main results are also robust when using the full sample.

Table 1 compares summary statistics for the workers to a nationally representative sample from the 2012 General Social Survey (GSS). The workers' responses are more politically and sexually liberal: data entry workers are younger, more likely to have seen an X-rated movie in the last year, and less frequent attenders of religious services than GSS survey participants. According to the workers' self-reports, 12% had casual sex in the last year and 70% say that they consider same sex relations to be okay, whereas among GSS survey participants, 5% had casual sex and 52% consider same sex relations to be okay.[10]

The empirical specification examines the effect of exposure to a liberal obscenity decision:

$$Outcome_{it} = \alpha + \beta_1 Treatment_t + \beta_2 X_{it} + \varepsilon_{it} \qquad (5)$$

For the main specifications, liberal treatment is constructed as a variable coded as 1 (for liberal treatment), 0 (for control), or −1 (for conservative treatment). In some robustness checks, we exclude the control or we only compare the liberal (conservative) treatment with the control. In other checks, we include X_{it}, a vector of demographic covariates.

To construct an aggregate measure for multiple outcome variables, we compute average effect sizes (AES) as in Kling et al. (2004): $(1/n)\sum_{n=1}^{N}\beta_n/\sigma_n$. This measure standardizes the coefficients on Treatment corresponding to each Outcome with the sample standard deviations of the outcome variable computed separately by treatment and control groups. For this, we jointly estimate the coefficients using seemingly unrelated regressions. A variable that summarizes community standards on sexual matters, for example, would roughly correspond to $E(v|a)$ and is calculated with AES using the incentivized survey questions that ask about other subjects' sexual attitudes.

We constructed AES measures for sets of questions concerning: (i) one's own standards (sexual attitudes), (ii) perceptions of other workers' values, i.e., community standards, (iii) perceived negative externalities, (iv) own behavior, and (v) beliefs about others' behaviors in the U.S.[11] These AES measures are defined consistently across the tables and the variables included in the calculations of each AES measure are listed in the online appendix.[12]

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[10] "Not wrong at all" and "Wrong only sometimes" are coded as okay while "Almost always wrong" and "Always wrong" are coded as not okay.

[11] We measure beliefs about others' behaviors both by asking workers directly for their beliefs and also incentivizing them to estimate accurately others' beliefs about the prevalence of certain behaviors.

[12] The AES for own standards uses workers' attitudes on: sex education, divorce, premarital sex, teen sex, extramarital sex, same sex relations, sexual materials leading to moral breakdown, sexual materials serving as an outlet for impulses and reducing mischief, and whether sexual materials should be restricted by pornography laws. The AES for perceived negative externalities uses attitudes on whether sexual materials lead to rape and whether sexual materials lead to sexually transmitted diseases. The AES for community standards uses incentivized estimates of other workers' attitudes on: sex

4. Results

4.1. Expressive effects of liberal obscenity decisions

Panel A of Table 2 shows estimates of the effect of exposure to liberal obscenity decisions on sexual attitudes and behaviors using data from all arms of the experiment. Relative to conservative decisions, liberal decisions cause workers to be 12%[13] more likely to view sexual materials as okay and 11% more likely to believe that "divorce should be made easier." These more liberal sexual attitudes are consistent with expressive effects of the law. The effects are economically sizeable relative to the beliefs in the population: 41% of workers think sexual materials are okay and 19% think divorce should be easier. Liberal decisions do not statistically affect attitudes regarding whether pornography should have no legal restrictions or whether same sex relations are okay. Exposure to liberal obscenity decisions leads subjects to believe that 8% more people are accepting of sexual materials (Table 2, column 6). This effect on a subject's norm perception is consistent with the intuition that people update their beliefs about sexual norms when liberal court decisions reveal information that community standards for sexual materials are more permissive than the subject previously thought or when liberal court decisions reveal information that high sexual activities are less prevalent than previously thought, which can reduce the honor (social perception) from abstaining more than it reduces the honor (social perception) from partaking in high sexual activities.

Column 5 shows the estimated average effect size (AES) for one's own moral standards in terms of sexual attitudes. Column 7 shows the AES for how one perceives *other* workers' standards, i.e., community standards. Column 8 shows a measure of perceived negative externalities of pornography. The estimates of AES of one's own moral standards are statistically significant at the 10% level. Liberal obscenity decisions have an expressive effect on one's own sexual attitudes taken as a whole as well as on perceived community standards, but not on perceived negative externalities.

We rule out the possibility of reporting bias in Panel B of Table 2. Reporting bias may arise if liberal obscenity law causes people to become more open or truthful, particularly about sensitive topics such as one's sexual behaviors. We verify with a falsification check that exposure to liberal obscenity decisions does not affect self-reported sexual behaviors, which should not change between the time of exposure to the treatment data entry paragraph and the response to the survey question.[14] In unreported regressions, we find similar results for attitudes and behaviors when restricting the analysis of liberal obscenity decisions to Arm 1, which replicates the experiment in Chen and Yeh (2013b) and consists of 91 workers who are surveyed only after they finish transcribing a randomly assigned court decision.

Table 3 shows the effects separately for liberal or conservative decisions when using the group that transcribes a placebo or no decision as the counterfactual. Compared to this counterfactual, liberal obscenity decisions have expressive effects on attitudes about sexual materials and divorce (Panel A) and appear to drive a large portion, 10% and 7% points respectively, of the 12% and 11% estimates found in Table 2. The effects of conservative laws do not statistically differ from the counterfactual; the negative signs for the two attitude variables would reflect an expressive response, but they are smaller in magnitude and not statistically significant (Panel B). The differences in subjects' beliefs about others' perceptions of sexual materials are noisy though consistent in sign with the law's information regarding conservative community standards. The AES estimate suggests that conservative obscenity decisions drive a larger portion of the expressive effects on community standards (column 7).

4.2. Heterogeneity in obscenity decisions

To explore heterogeneity of the law's effects, we distinguish between the effects of obscenity decisions about gay or lesbian depictions. In the last fifty years, between one-half and two-thirds of all federal appellate obscenity opinions used words that related to homosexuality (Chen and Yeh, 2013b). U.S. society has typically been more tolerant of lesbian women than of gay men. For example, gay men are far more likely to be socially stigmatized and vulnerable to becoming victims of violent acts (Herek, 2009). Table 4 shows responses depending on whether the obscenity decisions were about gay or lesbian depictions or were silent. Panel A restricts the analysis to workers who were exposed to obscenity decisions that referred to gay male depictions. The AES for own moral standards and AES for perceived community standards are not significantly different. However, liberal gay decisions do have expressive effects on a few individual variables, which we highlight in the table. Compared to conservative decisions about gay depictions, liberal decisions about gay depictions lead to greater

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education, divorce, premarital sex, teen sex, extramarital sex, same sex relations; and others' opinions that sexual materials lead to moral breakdown, lead to rape, serve as an outlet for impulses and reduce mischief, increase sexually transmitted diseases, or should be restricted by pornography laws. The AES for own behaviors uses self-reported activities in the past year on X-rated movie viewing, divorce, number of sex partners, extramarital sex, friend sex, casual sex, paid sex, and sex frequency. The AES for "beliefs about others" uses beliefs about the prevalence in the U.S. of same sex relations, sexually transmitted disease, and extramarital affairs; and incentivized estimates of other workers' beliefs about the prevalence in the U.S. of same sex relations, sexually transmitted disease, and extramarital affairs.

[13] We multiply the estimates in the tables by two because the table presents average effects of increasing 1 point going from conservative decisions (−1) to placebo (0) to liberal decisions (1).

[14] Like the GSS, the sexual behavior questions ask about acts in the last 12 months. These questions represent the "stock," so the difference across the treatment and control groups would capture the "flow" or the marginal change in behavior from the time the law was communicated in the transcription to the time of answering the survey questions. If the law changed material incentives, then actual behaviors may differ across treatment and control groups on the margin, within the time frame of the experiment, but this is unlikely because the questionnaire takes several minutes.

Table 2
The effect of exposure to liberal obscenity decisions on sexual attitudes and behaviors.

Panel A: Attitudes	Sexual materials are OK	Divorce should be easier	Homosexual sex is OK	Pornography should have no legal restrictions	Own standards: average effect size (AES)	Others feel sexual materials are OK	Community standards: AES	Negative externalities: AES
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mean dep. var.	0.41	0.19	0.70	0.12		0.46		
Liberal obscenity	0.0604**	0.0528***	−0.0272	0.0122	0.099*	0.0406*	0.094*	0.057
Decision (+1/0/−1)	[0.0246]	[0.0194]	[0.0231]	[0.0161]	p = 0.056	[0.0228]	p = 0.092	p = 0.342
Observations	593	596	586	594	596	178	178	596
R-squared	0.010	0.012	0.002	0.001		0.018		

Panel B: Behaviors	Nonmarital Sex in Last Year	Casual Date Sex in Last Year	Paid Sex in Last Year	Saw X-rated Movie	Sex Frequency Monthly or More	Friend Sex in Last Year	Multiple Partners in Last Year	Own Behaviors: AES
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mean dep. var.	0.10	0.12	0.04	0.45	0.61	0.42	0.79	
Liberal obscenity	−0.0130	−0.000309	0.00754	0.0115	0.0117	0.0133	0.00463	−0.0165
Decision (+1/0/−1)	[0.0155]	[0.0165]	[0.00969]	[0.0251]	[0.0252]	[0.0251]	[0.0206]	p = 0.700
Observations	571	574	593	589	555	570	570	593
R-squared	0.001	0.000	0.001	0.000	0.000	0.000	0.000	

Notes: Standard errors in brackets. AES for own standards uses workers' attitudes on: sex education, divorce, premarital sex, teen sex, extramarital sex, same sex relations, sexual materials leading to moral breakdown, sexual materials serving as an outlet for impulses and reducing mischief ("Sexual Materials are OK"), and whether sexual materials should be restricted by pornography laws. AES for perceived negative externalities uses opinions about whether sexual materials lead to rape or increase sexually transmitted diseases. AES for community standards uses incentivized estimates of other workers' attitudes on: sex education, divorce, premarital sex, teen sex, extramarital sex, same sex relations; and others' opinions that sexual materials lead to moral breakdown, lead to rape, serve as an outlet for impulses and reduce mischief, increase sexually transmitted diseases, or should be restricted by pornography laws. AES for own behaviors uses self-reported activities in the past year on X-rated movie viewing, divorce, number of sex partners, extramarital sex, friend sex, casual sex, paid sex, and sex frequency.

* $p < 0.10$.
** $p < 0.05$.
*** $p < 0.01$.

Table 3
The effect of exposure to valence of obscenity decisions on sexual attitudes.

	Sexual materials are OK	Divorce should be easier	Homosexual sex is OK	Pornography should have no legal restrictions	Own standards: AES	Others feel sexual materials are OK	Community standards: AES	Negative externalities: AES
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Liberal decisions								
Mean dep. var.	0.44	0.21	0.68	0.12		0.48		
Liberal obscenity	0.0990**	0.0706*	−0.00892	0.0255	0.166	0.0587	0.012	0.171
Decision vs. control	[0.0499]	[0.0409]	[0.0472]	[0.0330]	$p = 0.293$	[0.0466]	$p = 0.913$	$p = 0.162$
Observations	394	395	390	394	395	118	118	395
R-squared	0.010	0.008	0.000	0.002		0.014		
Panel B: Conservative decisions								
Mean dep. var.	0.38	0.16	0.71	0.11		0.44		
Conservative obscenity	−0.0218	−0.0351	0.0456	0.00119	−0.138	−0.0222	−0.176	0.057
Decision vs. control	[0.0491]	[0.0366]	[0.0460]	[0.0316]	$p = 0.402$	[0.0495]	$p = 0.120$	$p = 0.635$
Observations	392	396	389	393	396	114	114	396
R-squared	0.001	0.002	0.003	0.000		0.002		

Notes: Standard errors in brackets. AES for own standards uses workers' attitudes on: sex education, divorce, premarital sex, teen sex, extramarital sex, same sex relations, sexual materials leading to moral breakdown, sexual materials serving as an outlet for impulses and reducing mischief ("Sexual Materials are OK"), and whether sexual materials should be restricted by pornography laws. AES for perceived negative externalities uses opinions about whether sexual materials lead to rape or increase sexually transmitted diseases. AES for community standards uses incentivized estimates of other workers' attitudes on: sex education, divorce, premarital sex, teen sex, extramarital sex, same sex relations; and others' opinions that sexual materials lead to moral breakdown, lead to rape, serve as an outlet for impulses and reduce mischief, increase sexually transmitted diseases, or should be restricted by pornography laws. AES for own behaviors uses self-reported activities in the past year on X-rated movie viewing, divorce, number of sex partners, extramarital sex, friend sex, casual sex, paid sex, and sex frequency.

* $p < 0.10$.
** $p < 0.05$.
*** $p < 0.01$.

Table 4
The effect of exposure to type of liberal obscenity decisions on sexual attitudes.

	Sexual materials are OK	Divorce should be easier	Homosexual sex is OK	Pornography should have no legal restrictions	Own standards: AES	Others feel sexual materials are OK	Community standards: AES	Negative externalities: AES
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Gay obscenity decisions								
Mean dep. var.	0.46	0.24	0.76	0.13		0.48		
Liberal Obscenity	0.112***	0.0654*	0.0101	−0.0189	0.220	0.0382	0.109	0.159
Decision (+1/−1)	[0.0422]	[0.0364]	[0.0380]	[0.0295]	$p=0.116$	[0.0371]	$p=0.288$	$p=0.131$
Observations	135	136	131	135	136	48	48	48
R-squared	0.050	0.024	0.001	0.003		0.022		
Panel B: Lesbian obscenity decisions								
Mean dep. var.	0.36	0.16	0.64	0.09		0.46		
Liberal Obscenity	0.0548	0.0166	−0.0950**	0.00295	0.035	0.0387	−0.031	−0.059
Decision (+1/−1)	[0.0421]	[0.0319]	[0.0419]	[0.0251]	$p=0.482$	[0.0483]	$p=0.755$	$p=0.570$
Observations	133	134	131	134	134	30	30	30
R-squared	0.013	0.002	0.038	0.000		0.022		
Panel C: Non-homosexual obscenity decisions								
Mean dep. var.	0.46	0.18	0.73	0.14		0.46		
Liberal Obscenity	0.0286	0.0864**	0.0159	0.0597*	0.266**	0.0462	0.199*	0.094
Decision (+1/−1)	[0.0437]	[0.0332]	[0.0393]	[0.0304]	$p=0.011$	[0.0352]	$p=0.033$	$p=0.358$
Observations	132	131	131	132	132	46	46	46
R-squared	0.003	0.050	0.001	0.029		0.038		

Notes: Standard errors in brackets. AES for own standards uses workers' attitudes on: sex education, divorce, premarital sex, teen sex, extramarital sex, same sex relations, sexual materials leading to moral breakdown, sexual materials serving as an outlet for impulses and reducing mischief ("Sexual Materials are OK"), and whether sexual materials should be restricted by pornography laws. AES for perceived negative externalities uses opinions about whether sexual materials lead to rape or increase sexually transmitted diseases. AES for community standards uses incentivized estimates of other workers' attitudes on: sex education, divorce, premarital sex, teen sex, extramarital sex, same sex relations; and others' opinions that sexual materials lead to moral breakdown, lead to rape, serve as an outlet for impulses and reduce mischief, increase sexually transmitted diseases, or should be restricted by pornography laws. AES for own behaviors uses self-reported activities in the past year on X-rated movie viewing, divorce, number of sex partners, extramarital sex, friend sex, casual sex, paid sex, and sex frequency.

* $p<0.10$.
** $p<0.05$.
*** $p<0.01$.

Table 5
Heterogenous Effects of Exposure to Liberal Obscenity Decisions on Sexual Attitudes and Beliefs.

	Favor sex Ed in public schools	Divorce should be easier	Homosexual sex is OK	Sexual materials are OK	Pornography should have no legal restrictions	Others favor sex Ed in public schools	Others feel premarital sex is OK	Percentage of people who have extramarital sex	Republican (self-identification) (+1/0/−1)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: Heterogeneity by religious attendance									
Mean dep. var.	0.89	0.19	0.70	0.41	0.12	0.69	0.65	0.32	−0.31
Liberal Obscenity Decision (+1/0/−1)	0.0271	0.0618***	−0.0203	0.0695**	0.0157	−0.000517	−0.00656	−0.00254	−0.0295
	[0.0169]	[0.0214]	[0.0228]	[0.0270]	[0.0179]	[0.0210]	[0.0237]	[0.0106]	[0.0420]
Frequently Attend Religious Services	−0.217***	−0.115***	−0.553***	−0.211***	−0.0870**	−0.00549	0.0575	0.0435**	0.480***
	[0.0320]	[0.0409]	[0.0437]	[0.0517]	[0.0344]	[0.0409]	[0.0460]	[0.0203]	[0.0803]
Liberal × Frequently Attend Services	−0.0877**	−0.0547	−0.0871*	−0.0638	−0.0250	0.0997**	0.0964*	−0.0421*	0.215**
	[0.0381]	[0.0487]	[0.0517]	[0.0613]	[0.0406]	[0.0490]	[0.0551]	[0.0242]	[0.0956]
Observations	592	596	586	593	594	178	178	600	600
R-squared	0.079	0.027	0.219	0.039	0.012	0.029	0.025	0.016	0.062
Panel B: Heterogeneity by red state									
Mean dep. var.	0.89	0.19	0.70	0.41	0.12	0.69	0.65	0.32	−0.31
Liberal Obscenity Decision (+1/0/−1)	0.0189	0.0477**	−0.0225	0.0695**	0.0150	0.0134	0.00360	−0.0156	−0.00342
	[0.0192]	[0.0235]	[0.0280]	[0.0299]	[0.0196]	[0.0230]	[0.0259]	[0.0116]	[0.0472]
Red State	−0.0119	0.0451	−0.132***	0.0328	−0.0538*	0.0216	−0.0320	0.0172	0.104
	[0.0278]	[0.0343]	[0.0404]	[0.0435]	[0.0285]	[0.0341]	[0.0383]	[0.0170]	[0.0688]
Liberal × Red State	−0.0176	0.0184	−0.0218	−0.0263	−0.0112	0.0143	0.0220	0.0143	0.0308
	[0.0336]	[0.0415]	[0.0489]	[0.0525]	[0.0344]	[0.0417]	[0.0468]	[0.0205]	[0.0832]
Observations	592	596	586	593	594	178	178	600	600
R-squared	0.002	0.016	0.021	0.012	0.007	0.008	0.006	0.005	0.004

Red states: AK, AL, AR, AZ, GA, ID, IN, KS, KY, LA, MO, MS, MT, NC, ND, NE, WV, OK, SC, UT, TX, TN. Standard errors in brackets.

* $p < 0.10$.
** $p < 0.05$.
*** $p < 0.01$.

Table 6
Heterogenous effects of exposure to liberal obscenity decisions on sexual attitudes and beliefs.

Sample	Frequently attend religious services: weekly or more				Attend less than weekly			
	Own standards	Community standards	Negative externalities	Beliefs about others	Own standards	Community standards	Negative externalities	Beliefs about others
Liberal Obscenity Decision (+1/0/−1)	−0.018 $p=0.105$	0.026*** $p=0.0096$	−0.0063* $p=0.086$	−0.0069* $p=0.085$	0.018 $p=0.325$	0.0045 $p=0.640$	−0.004 $p=0.969$	0.0017 $p=0.646$
Observations	109	33	109	109	491	145	491	491

Notes: See text for the variables used in AES measures. The AES could not be computed because the standard deviation of the control was 0 for frequent attenders for some answers.

* $p<0.10$.
** $p<0.05$.
*** $p<0.01$.

Table 7
Effects of exposure to liberal obscenity decisions on sexual attitudes and beliefs by religious attendance.

	Favor sex Ed in public schools	Divorce should be easier	Homosexual sex is OK	Sexual materials are OK	Pornography should have no legal restrictions	Others favor sex Ed in public schools	Others feel premarital sex is OK	Percentage of people who have extramarital sex	Republican (self-identification) (+1/0/−1)	Very satisfied with work experience
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Never attenders										
Mean dep. var.	0.94	0.24	0.89	0.51	0.16	0.68	0.64	0.31	−0.45	0.30
Liberal obscenity	0.0203	0.0761**	−0.0268	0.0826**	0.00187	−0.0313	0.0169	−0.0217	−0.0377	0.0121
Decision (+1/0/−1)	[0.0174]	[0.0311]	[0.0235]	[0.0369]	[0.0277]	[0.0281]	[0.0301]	[0.0135]	[0.0514]	[0.0341]
Observations	279	283	280	282	283	83	83	286	286	286
R-squared	0.005	0.021	0.005	0.018	0.000	0.015	0.004	0.009	0.002	0.000
Panel B: Yearly										
Mean dep. var.	0.91	0.14	0.71	0.42	0.08	0.69	0.65	0.31	−0.28	0.32
Liberal obscenity	0.0434	0.0379	0.00117	0.0484	0.0534*	0.0718*	−0.0501	0.0286	−0.000202	0.190***
Decision (+1/0/−1)	[0.0304]	[0.0398]	[0.0514]	[0.0547]	[0.0304]	[0.0397]	[0.0442]	[0.0203]	[0.0862]	[0.0489]
Observations	120	119	117	119	119	40	40	120	120	120
R-squared	0.017	0.008	0.000	0.007	0.026	0.079	0.033	0.017	0.000	0.114
Panel C: Monthly										
Mean dep. var.	0.88	0.19	0.63	0.34	0.09	0.74	0.68	0.34	−0.38	0.29
Liberal obscenity	0.0204	0.0528	−0.0660	0.0357	−0.00104	0.00701	−0.0193	0.0219	−0.0507	0.105*
Decision (+1/0/−1)	[0.0396]	[0.0534]	[0.0653]	[0.0636]	[0.0392]	[0.0367]	[0.0717]	[0.0278]	[0.0988]	[0.0601]
Observations	84	85	83	84	85	22	22	85	85	85
R-squared	0.003	0.012	0.012	0.004	0.000	0.002	0.004	0.007	0.003	0.035
Panel D: Weekly										
Mean dep. var.	0.70	0.10	0.27	0.24	0.05	0.63	0.69	0.34	0.09	0.34
Liberal obscenity	−0.0711	0.0123	−0.0912	0	−0.00855	0.131*	0.0968	−0.0505**	0.253**	−0.0207
Decision (+1/0/−1)	[0.0584]	[0.0377]	[0.0578]	[0.0560]	[0.0306]	[0.0664]	[0.0697]	[0.0241]	[0.111]	[0.0613]
Observations	85	85	82	84	84	24	24	85	85	85
R-squared	0.018	0.001	0.030	0.000	0.001	0.151	0.081	0.050	0.059	0.001
Panel E: ≥Weekly										
Mean dep. var.	0.64	0.11	0.14	0.18	0	0.81	0.68	0.41	0.18	0.22
Liberal obscenity	−0.0316	−0.0105	−0.147	0.0368	0	−0.00935	0.0734	−0.0316	−0.0789	−0.0263
Decision (+1/0/−1)	[0.113]	[0.0725]	[0.0926]	[0.106]	[.]	[0.0443]	[0.0676]	[0.0609]	[0.231]	[0.106]
Observations	24	24	24	24	23	9	9	24	24	24
R-squared	0.004	0.001	0.103	0.005	.	0.006	0.144	0.012	0.005	0.003

Notes: Standard errors in brackets.

* p < 0.10.
** p < 0.05.
*** p < 0.01.

acceptance of sexual materials and stronger feelings that divorce should be easier. Attitudes about homosexual sex are not affected.

Among workers who transcribed obscenity decisions about lesbian depictions, liberal decisions generate backlash about homosexual sex. Workers become 19% less likely to say that homosexual sex is okay (column 3 of Panel B). The sample is disproportionately female, and we consider whether women respond differently than men to decisions that allow lesbian materials, but more data are needed. Panel C shows that exposure to liberal decisions that were silent about homosexuality
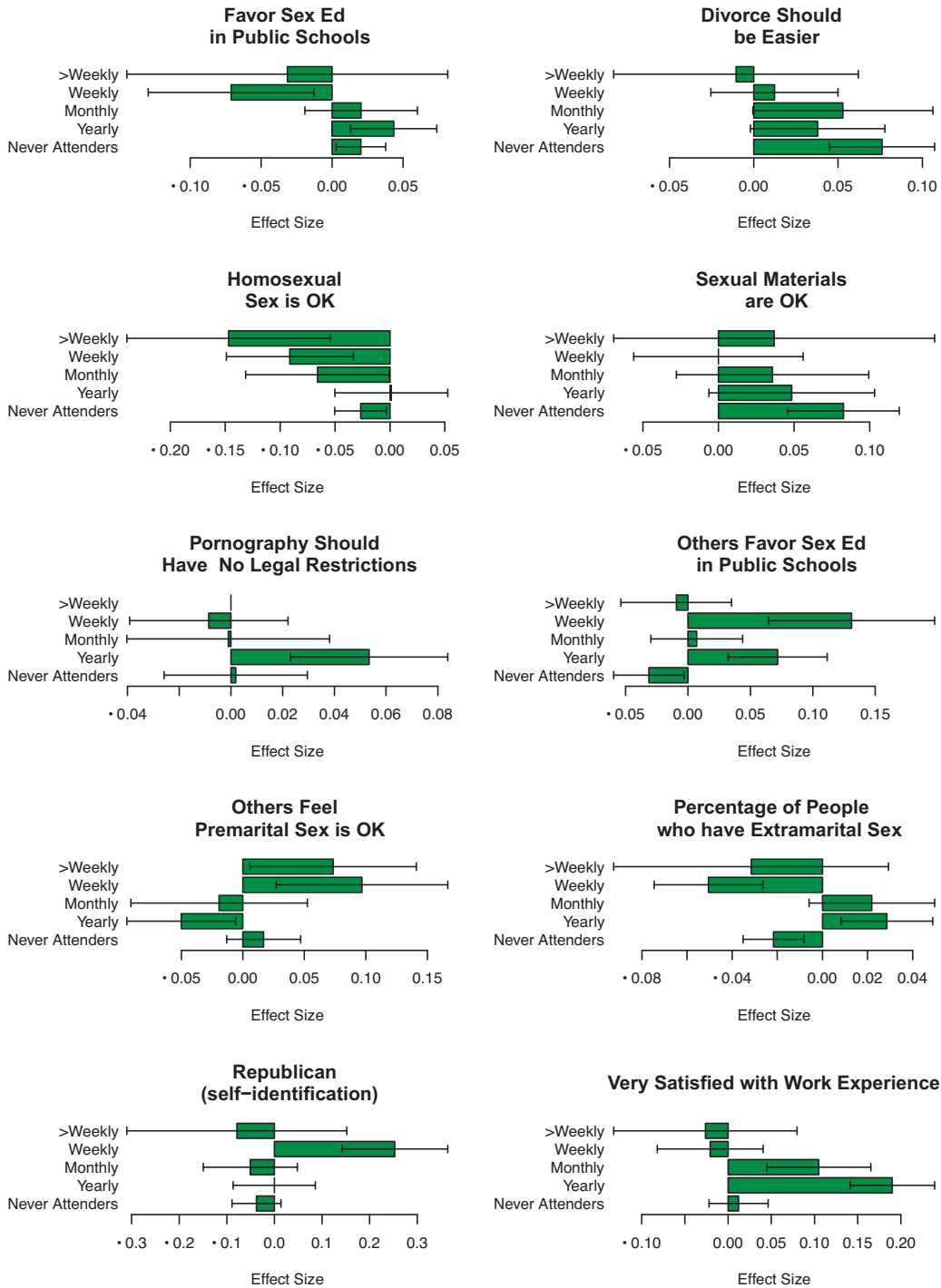

Fig. 3. Treatment effects by religious attendance. *Notes*: Effect size is the change in the percent of people who report the answer in the title of the bar chart, with the exception of Republican self-identification which is coded as 1/0/−1. See Table 7 for details.
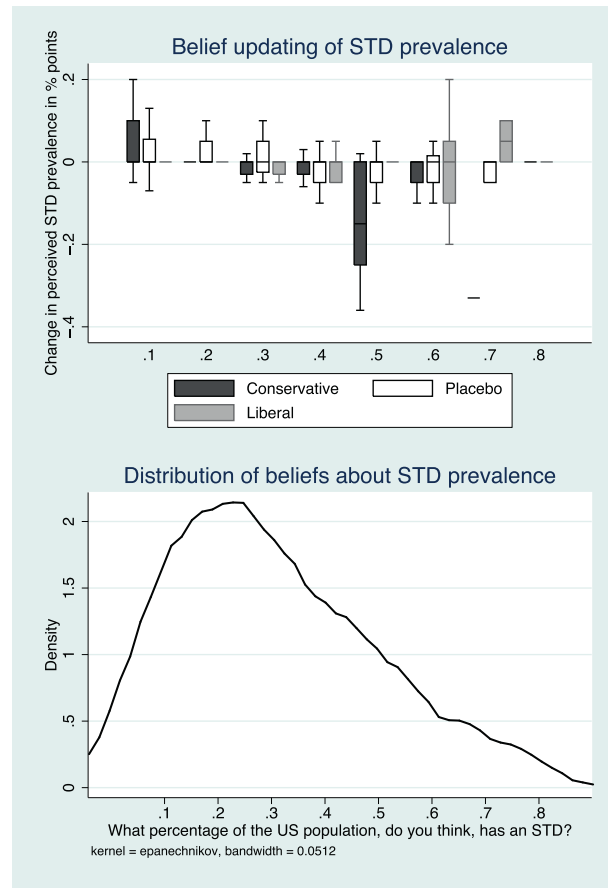
Fig. 4. Beliefs about sexually transmitted disease prevalence.

causes people to be 17% more likely to say that divorce should be easier and 12% more likely to say that pornography should have no legal restrictions. According to the AES estimate, one's own sexual attitudes become more liberal overall (column 5) as do estimates of others' sexual attitudes (column 7). These shifts in attitudes signify expressive effects of non-homosexual obscenity decisions. None of the sub-categories of liberal decisions shifts views on the negative externalities of sexual materials (column 8).

4.3. Backlash effects among conservative groups

Scholars have documented conservative backlash to liberal court decisions, such as Southern governments' stronger resistance to desegregation after Brown v. Board of Education[15] and Catholics' stronger opposition to abortion after Roe v. Wade[16] (Hoekstra, 2000; Klarman, 1994). Religiously devout people tend to have more conservative sexual attitudes to begin with. Table 5 investigates how effects of liberal decisions vary by religious attendance. We find that liberal obscenity decisions drive backlash among religious workers, whom we define as attending services at least once a week (18.5% of the sample). Compared to infrequent attendees, religious workers are less likely to favor sex education in public schools or to accept that homosexual sex is okay upon exposure to liberal decisions (Panel A). Religious workers do not statistically differ from infrequent attendees in their responses about sexual materials or divorce, though the signs of the coefficients are in a conservative direction.

Notably, liberal decisions cause religious workers to identify more strongly with the Republican Party, which is associated with conservative values (Table 5, column 9). In Panel B of Table 5, we test for heterogeneity by residence in a "red state," in which Republican Party candidates have won the majority of votes in recent presidential elections. Red state residents do not statistically differ from residents of other states in their responses to liberal decisions. This suggests that our measure for religious attendance is not simply capturing a red state vs. blue state phenomenon.

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[15] 347 U.S. 483 (1954).
[16] 410 U.S. 113 (1973).

Table 8
The effect of exposure to liberal obscenity decisions on utility.

	OLS Worker is very satisfied (1/0)		Ordered probit Worker satisfaction (1–4)	
	(1)	(2)	(3)	(4)
Panel A				
Mean dep. var.	0.31		3.04	
Liberal obscenity	0.0545**	0.0741***	0.154**	0.212***
Decision (+1/0/−1)	[0.0229]	[0.0255]	[0.0654]	[0.0733]
Frequently attend		0.00175		0.0113
Religious services		[0.0489]		[0.139]
Liberal × Frequently		−0.101*		−0.289*
Attend services		[0.0582]		[0.166]
Observations	600	600	600	600
R-squared	0.009	0.014		
Panel B (no control group)				
Mean dep. var.	0.31		3.04	
Liberal obscenity	0.0545**	0.0739***	0.153**	0.210***
Decision (+1/−1)	[0.0231]	[0.0257]	[0.0652]	[0.0732]
Frequently attend		0.0137		0.0475
Religious services		[0.0587]		[0.165]
Liberal × Frequently		−0.0997*		−0.281*
Attend services		[0.0587]		[0.165]
Observations	404	404	404	404
R-squared	0.014	0.021		

Notes: Standard errors in brackets.
Panel B drops the control groups from analysis (some control groups had 1 fewer paragraph of data entry than treatment groups).

* $p < 0.10$.
** $p < 0.05$.
*** $p < 0.01$.

Average effect sizes for own moral standards and perceived community standards among religious workers go in opposite signs – in response to liberal court decisions, perceived community standards become more liberal (Table 6). Table 7 and Fig. 3 break out the effects separately for each category of religious attendance. Fig. 3 suggests that liberal decisions have weakly expressive effects on moral standards among workers who attend religious services less than once a week, although Table 6 indicates that this effect is not jointly statistically significant.

4.4. Belief updating and information transmission

Belief updating in response to a law may differ by community or individual values, and the interpretation of information that is communicated by a law may vary. A law that outlaws a sexual activity can cause people to think that community standards are more conservative, or it can cause people to believe that the activity is more prevalent because it is driving policymakers to seek a ban, and vice versa for more permissive laws. We find evidence of the law influencing beliefs, especially among religious workers (Table 5, columns 6 and 7). Among religious workers, conservative obscenity decisions increase the perception of negative externalities of pornography (Table 6, column 3) and increase the perception that others have extramarital sex (Table 5, column 8). Non-religious workers increase their perceptions of others having extramarital sex as well, but not significantly so.

We also exploit the fact that some workers answered questions before transcribing the newspaper summary of a court decision about obscenity and some answered the questions after the transcription. We can construct a differences-in-differences model that compares responses before and after exposure to liberal vs. conservative decisions. The average coefficient is positive on individual moralities (more liberal attitudes on sex education, divorce, and teenage sex) and negative on the prevalence of sexual activities (conservative decisions increase the perceptions of others having extramarital sex and same-sex relations), but the difference is not statistically significant (results not displayed).

Finally, we exploit the response before and after exposure to court decisions within workers on beliefs about the prevalence of sexual activities. Consistent with conservative decisions updating workers' beliefs upwards on the prevalence of certain sexual activities, the average coefficient is negative, but the estimates are not significant. Interestingly, liberal decisions polarize beliefs about the incidence of sexually transmitted diseases: people who initially estimated a high prevalence of STDs in the U.S. increased their estimates, while those who initially estimated a lower STD prevalence decreased their estimates. This result, significant at the 1% level,[17] can be seen in the top panel of Fig. 4, which plots the change in perceived

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[17] We run a Mann–Whitney test for differences in distributions, but do not report in a table.

STD prevalence depending on workers' initial belief in the percentage of people who had STDs. Conservative decisions had a unifying effect. Among people who initially estimated a low prevalence of STDs in the U.S., conservative decisions increased their belief about the prevalence of STDs, while among people who initially estimated a high prevalence of STDs, conservative decisions decreased their belief about the prevalence of STDs. The median belief was 30% (Fig. 4 lower panel), which is close to the CDC estimates of 110 million Americans with STIs.[18]

4.5. Worker satisfaction and honor

In view of the model's discussion of honor and utility, we consider effects on worker satisfaction. Exposure to liberal decisions increased by 9% the rate at which workers reported being very satisfied with their work experience out of the population average of 31% (Table 8). Notably, those who frequently attend religious services were less likely to be very satisfied upon exposure to liberal decisions. These effects are robust to using an ordered probit for the four categories of worker satisfaction as well as dropping the control group, some of which had one fewer paragraph of data entry so may have had their satisfaction affected as a result.

5. Conclusion

This paper tests a model of law and norms that predicts when the law has expressive or backlash effects among different communities, distinguishes between the law's effects on individual and community standards of morality, and uses an incentive compatible mechanism to isolate a belief-updating channel for the law's indirect social effects. We find that liberal obscenity precedent relaxes sexual attitudes. Workers randomly assigned to transcribing newspaper summaries of liberal as opposed to conservative court decisions reported more relaxed sexual attitudes and estimated others' standards of morality to be more relaxed. But frequent attendees of religious services become stricter on their own standards of morality. We find evidence of belief-updating: workers differentially update their beliefs about the prevalence of sexual behaviors in response to liberal or conservative decisions. These results are consistent with a model of law where conservative laws cause people to update their beliefs upwards about the prevalence of certain activities, which affects the morality of such activities.

We also find that liberal obscenity decisions increase worker satisfaction overall, but decrease satisfaction among religious workers, who also identify more as Republican. The model predicts that in communities where such proscribed activities are prevalent, liberal policies liberalize attitudes, increase the perceived morality (honor) of partakers, and often increase utility of partakers, since the cost of partaking declines. But backlash arises in communities where such activities are rare: the perceived morality of partakers declines and utility falls (holding behavior fixed, as would be the case in an experiment).

Obscenity regulations have generated attention worldwide, raising issues about freedom of speech whose scope can diverge broadly by community norms. In India, where kissing in public can lead to criminal obscenity charges, prosecutors have targeted Google and Facebook for hosting offensive depictions of religious figures. An obscene film depiction of Islam has been linked to angry attacks on the U.S. embassy in Libya at Benghazi. Law enforcement is on alert as advances in technology have enabled a flurry of boundary-pushing pornographic imagery to be distributed over the Internet.

It has been argued that morality incentivizes socially optimal behaviors through channels of guilt, shame, or virtue (Kaplow and Shavell, 2007). Judges as well as academics have hypothesized that laws that shift moral standards or sexual norms have broader implications on crime, employment, public health, and political legitimacy in general. Dal Bo and Dal Bo (2013) explore whether moral suasion affects behavior in public goods games and finds announcements of a moral norm change moral behavior but only in short-term. In a related paper (Chen and Yeh, 2013b) that analyzes the U.S. population over time, we find that obscenity law matters in long-term "secondary" effects such as sex crimes, divorce, and sexually transmitted diseases.[19] This paper provides complementary evidence on the intermediate mechanisms for a model predicting when law has backlash or expressive effects and suggests that legitimacy of law can, moreover, affect utility and self-identification.

Appendix 1. Experimental design

Methodology

Our methodology is adapted from several papers (e.g., Chen, 2011; Chen and Schonger, 2013) and we provide a generic description. We recruit workers through a labor market intermediary (LMI), Amazon Mechanical Turk. The LMI is designed to recruit a large number of workers in a short amount of time. Through an interface provided by the LMI, buyers post

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[18] http://www.cdc.gov/std/stats/sti-estimates-fact-sheet-feb-2013.pdf.

[19] Both moral harms and their "secondary effects," e.g., crime and venereal disease, were discussed in the Supreme Court decisions Young v. Adult Mini Theatres, Inc., 427 U.S. 50 (1976), and Renton v. Playtime Theatres, Inc., 475 U.S. 41 (1986).

tasks and registered workers perform the tasks for money.[20] The tasks are generally simple for humans to do yet difficult for computers. Common tasks include captioning photographs, extracting data from scanned documents, and transcribing audio clips. The LMI also allows a researcher to implement randomization although randomization is not inherent to the LMI.

The LMI can be used to implement anything from a natural field experiment to a laboratory experiment. In the LMI, workers come to the marketplace naturally and are unaware they are in an experiment at the time of arrival. The behavior of subjects in the LMI is comparable to the behavior of subjects in a laboratory and may be comparable to subjects in a real labor market (Horton et al., 2011).

Although most buyers post tasks directly on the LMI website, they are also able to host tasks on an external site. On the LMI, we post a single placeholder task containing a description of the work and a link to an external site for workers to follow if they want to participate. On the external site, we ask all workers to transcribe paragraphs of scanned texts consisting of a Tagalog translation of Adam Smith's The Wealth of Nations as well as English paragraphs of dictionary definitions. This "lock-in" task is tedious so that no one is likely to do it "for fun," and it is simple enough so that all market participants can do the task. The source text was machine-translated to prevent subjects from finding the text elsewhere on the Internet. Time and money are the most cited reasons for participation in Mechanical Turk.[21] If subjects are unaware of an ongoing experiment, researchers worry that differential attrition may arise at the time treatment is revealed. The lock-in data entry serves as an effective commitment mechanism to minimize attrition from the experiment; the attrition rate after this task was 1%.

All workers were asked to transcribe three-paragraph length, scanned texts (lock-in text paragraphs) into a text box (Appendix 2 online). On completion, workers were randomized into three experimental groups[22]:

(1) Arm 1:
   (i) Workers were asked to transcribe a fourth paragraph – one of eight different paragraphs randomly assigned (Appendix 3).
   (ii) They proceeded to answer several questions on their own sexual attitudes and behaviors (Appendices 4 and 6).
   (iii) Workers are asked about their perceptions of U.S. sexual behaviors (prevalence of same-sex relationships, extramarital relationships, and STDs) (Appendix 7).
   A few workers were randomized into a group such that they did not transcribe a fourth paragraph. They proceeded from the three lock-in paragraphs directly to the questions on sexual attitudes, behaviors, and perceptions of U.S. sexual behaviors.
(2) Arm 2:
   (i) Once the workers complete the three lock-in paragraphs, they answer four questions on sexual attitudes (Appendix 4, Questions 1–4).
   (ii) Workers are asked about their perceptions of U.S. sexual behaviors (prevalence of same-sex relationships, extramarital relationships, and STDs) (Appendix 7).
   (iii) On completion, they are randomized into one of eight groups, as in Arm 1, where each group gets a different paragraph for a total of six treatment groups and two control groups (Appendix 3).
   (iv) Workers are then asked more questions on their own sexual attitudes (Appendix 4, Questions 5–11), and behaviors (Appendix 6).
   (v) Finally, workers are again asked about their perceptions of U.S. sexual behaviors (prevalence of same-sex relationships, extramarital relationships, and STDs) (Appendix 7).
(3) Arm 3: Similar to Arm 2 except that there were additional incentive-based questions on getting a close approximation to how other people answered.
   (i) Once the workers complete the three lock-in paragraphs, they answer four questions on sexual attitudes (Appendix 4, Questions 1–4).
   (ii) Workers are asked about their perceptions of U.S. sexual behaviors (prevalence of same-sex relationships, extramarital relationships, and STDs) (Appendix 7).
   (iii) Workers are then asked to estimate what other workers would say about their perceptions of U.S. sexual behaviors and are offered a payment incentive for accuracy (Appendix 8).
   (iv) On completion, they are randomized into one of eight groups where each group gets a different paragraph (Appendix 3).
   (v) Workers are then asked more questions on their own sexual attitudes (Appendix 4, Questions 5–11).

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[20] Amazon Mechanical Turk has several measures that prevent a worker from entering the experiment more than once. A worker ID may not accept the same task twice. It also prevents a single person from generating multiple worker IDs by using e-mail addresses, IP addresses, and in some cases, bank accounts.

[21] http://behind-the-enemy-lines.blogspot.com/2008/03/mechanical-turk-demographics.html. Some workers do it out of need. A disabled former United States Army linguist became a Turk Worker for various reasons and in nine months he made four thousand dollars (New York Times, March 25, 2007). Some drop out of college to pursue a full time career with these disaggregated labor markets (Web Worker Daily, October 16, 2008, Interview with oDesk CEO). For more information about the motivation and demographics of Mechanical Turk workers, see Paolacci et al. (2010).

[22] Appendices 3–9 are found online.

  (vi) Workers are asked how other workers would answer the attitude questions and are offered a payment incentive for accuracy (Appendix 5).
 (vii) They are asked questions on their own sexual behavior (Appendix 6).
(viii) Workers are again asked questions on their perceptions of U.S. sexual behaviors (prevalence of same-sex relationships, extramarital relationships, and STDs) (Appendix 7)
  (ix) Workers are then asked to estimate what other workers would say about their perceptions of U.S. sexual behaviors and are offered a payment incentive for accuracy (Appendix 8).

Workers were assigned one of the three groups above randomly, and once they had answered questions in the order specific to their groups, they proceeded to answer questions on the percentage of the US population, they thought:

- Regularly have same-sex relations
- Have sexually transmitted disease (STD)
- Have had or currently having an extramarital affair

Workers in Groups 2 and 3 answered the above questions twice – before and after they had transcribed the fourth paragraph that elaborated on certain sexual behaviors through US court rulings, which were either conservative (censuring such behavior) or liberal (did not criminalize such behavior).

After answering questions on the sexual behavior of people in the US, the workers then took a short survey that asked their gender, age, state of residence in the US, religious preference (Protestant, Catholic, Jewish, Latter-Day Saints, None, Others – specify), how often they attend services (never, once a year, once a month, once a week, or multiple times a week), race/ethnicity (White, Hispanic, Asian/Pacific Islander, Native American, Black), and political affiliation (Strong democrat, Not so Strong Democrat, Independent – Near Democrat, Independent, Independent – Near Republican, Not Strong Republican, Strong Republican, Other Party, Don't Know).

The last question was on their work experience – Very satisfied, Satisfied, Slightly satisfied, and Not at all satisfied.

After work was completed according to the original expiry date listed on the LMI, bonuses were calculated and workers were notified of their earnings.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.jebo.2013.10.013.

References

Alesina, A., Fuchs-Schündeln, N., 2007. Good-Bye Lenin (or Not?): the effect of communism on people's preferences. American Economic Review 97 (4), 1507–1528.
Bailey, M.J., 2010. Momma's Got the Pill: how Anthony Comstock and Griswold v. Connecticut shaped U.S. childbearing. American Economic Review 100 (1), 98–129.
Bartels, B.L., Mutz, D.C., 2009. Explaining processes of institutional opinion leadership. Journal of Politics 71 (1), 249–261.
Benabou, R.J., Tirole, J., 2011. Laws and Norms, NBER Working Paper No. 17579.
Bicchieri, C., 2006. The Grammar of Society: The Nature and Dynamics of Social Norms.
Chen, D.L., 2011. Markets Morality, and Economic Growth: Does Competition Affect Utilitarian Commitments?
Chen, D.L., Schonger, M., 2013. Social Preferences or Sacred Values? Theory and Evidence of Deontological Motivations.
Chen, D.L., Yeh, S., 2013a. Distinguishing between custom and law: empirical examples of endogeneity in property and first amendment precedents. William and Mary Bill of Rights Journal 21 (1081.).
Chen, D.L., Yeh, S., 2013b. How Do Rights Revolutions Occur? Free Speech and the First Amendment, 1958–2008.
Costa, D.L., Kahn, M.E., 2010. Energy Conservation 'Nudges' and Environmental Ideology: Evidence from a Randomized Residential Electricity Field Experiment, NBER Working Paper No. 15939.
Dahl, G., Della Vigna, S., 2009. Does movie violence increase violent crime? Quarterly Journal of Economics 124 (2), 677–734.
Dal Bo, E., Dal Bo, P., 2013. 'Do the Right Thing': The Effects of Moral Suasion on Cooperation, Brown University Working Paper.
Dharmapala, D., McAdams, R., 2003. The Condorcet Jury theorem and the expressive function of law. American Law and Economics Review 5 (1), 1–31.
Edelman, B., 2009. Red light states: who buys online adult entertainment? Journal of Economic Perspectives 23 (1), 209–220.
Herek, G.M., 2009. Hate crimes and stigma-related experiences among sexual minority adults in the United States: prevalence estimates from a national probability sample. Journal of Interpersonal Violence 24 (1), 54–74.
Hoekstra, V., 2000. The Supreme Court and local public opinion. American Political Science Review 94 (1), 89–100.
Horton, J., Rand, D.G., Zeckhauser, R.J., 2011. The online laboratory: conducting experiments in a real labor market. Experimental Economics 14 (3), 399–425.
Kaplow, L., Shavell, S., 2007. Moral rules, the moral sentiments, and behavior: toward a theory of an optimal moral system. Journal of Political Economy 115 (3.).
Kendall, T.D., 2007. Pornography, Rape, and the Internet, working paper.
Klarman, M., 1994. How brown changed race relations: the backlash thesis. Journal of American History 81 (1), 81–118.
Klarman, M., 2005. Brown and Lawrence (and Goodridge). Michigan Law Review 104 (3), 431–489.
Kling, J., Liebman, J., Katz, L., Sanbonmatsu, L., 2004. Moving to Opportunity and Tranquility: Neighborhood Effects on Adult Economic Self-Sufficiency and Health from a Randomized Housing Experiment, Princeton IRS Working Paper 481, April.
Koppelman, A., 2005. Does obscenity cause moral harm? Columbia Law Review 105, 1635–1679.
Kotsadam, A., Jakobsson, N., 2011. Do laws affect attitudes? An assessment of the Norwegian prostitution law using longitudinal data. International Review of Law and Economics 31 (2), 103–115.
Lessig, L., 1995. The regulation of social meaning. University of Chicago Law Review 62 (3), 943–1045.

Linz, D., Donnerstein, E., Land, K.C., Shafer, B.J., McCall, P.L., Graesser, A.C., 1995. Discrepancies between the legal code and community standards for sex and violence: an empirical challenge to traditional assumptions in obscenity law. Law & Society Review 29 (1.).

Lord, C.G., Ross, L., Lepper, M.R., 1979. Biased assimilation and attitude polarization: the effects of prior theories on subsequently considered evidence. Journal of Personality and Social Psychology 37 (11), 2098–2109.

MacKinnon, C.A., 1985. Pornography civil rights, and speech. Harvard Civil Rights-Civil Liberties Law Review 20 (1.).

Paolacci, G., Chandler, J., Ipeirotis, P., 2010. Running experiments on Amazon Mechanical Turk. Judgment and Decision Making 5 (5), 411–419.

Sunstein, C.R., 1996. On the expressive function of law. University of Pennsylvania Law Review 144 (5), 2021–2053.

Tyler, T.R., 2006. Why People Obey the Law. Princeton University Press, Princeton, New Jersey.