Rape Culture and Its Effects: Evidence from U.S. Newspapers, 2000-2013

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Abstract: We offer the first quantitative analysis of the presence, magnitude and effects of “rape culture” in the United States. Observers have long worried that biased news coverage of rape - which blames victims, empathizes with perpetrators, implies consent, and questions victims' credibility - may deter victims from coming forward, and ultimately increase the incidence of rape. We present a theory of how rape culture might shape the preferences and choices of perpetrators, victims and law enforcement, and test this theory with data on news stories about rape published in U.S. newspapers between 2000 and 2013. We find that rape culture in the media predicts both the frequency of rape and its pursuit through the local criminal justice system. In jurisdictions where rape culture was more prevalent, there were more documented rape cases, but authorities were less vigilant in pursuing them.
In recent years the United States has seen growing public debate around media bias in news reporting of rape and sexual assault. News coverage of cases like the 2012 Steubenville, Ohio gang rape raised concerns about media empathizing with the accused and neglecting the victim’s perspective. Much of this discussion centers on the idea of “rape culture,” which scholars and activists define as “a set of values and beliefs that provide an environment conducive to rape” (Boswell and Spade 1996), where “rape is often not acknowledged as a crime and its victims are frequently blamed ... for their own violation” (Vogelman 1990). Because news coverage can influence public policy preferences (Iyengar and Kinder 1987), observers fear that rape culture, reflected in the media, might make authorities less assertive in investigating rape allegations, victims less likely to report assaults, and perpetrators more likely to commit rape (Valenti 2014).

Rape culture has important implications for theory and policy, since social perceptions of sexual violence -- for example, whether rape is possible within marriage -- bound women’s political, social and economic rights. Feminist scholars have long viewed social norms about rape and the treatment of its victims as defining features of gender equality (Brownmiller 1975), with “rape-prone” societies characterized by high levels of sex segregation, devaluation of women, and interpersonal violence (Sanday 1981). Despite growing public interest (Madden 2014), social science research on rape culture remains limited (Wolf 2013). Nearly all existing analyses rely on case studies. There have been no dedicated empirical efforts to estimate either the extent of rape culture in the press, or the effect of rape culture on sexual crime.

Our study is the first to quantify rape culture and assess its impact on the local prevalence of rape. We do so by using newspaper coverage as a measure of local norms, tracking the content of stories about rape, and which communities consumed this coverage. Although local news coverage is only one indicator of local norms, it is one of few that are consistently measurable
across the United States. By developing a text classification model to detect commonly cited aspects of rape culture in the media -- like victim-blaming language, empathy for the accused, implications of consent and incredulity toward victims -- we classify over 300,000 news articles about rape across 279 U.S. newspapers, most of them local, between 2000 and 2013. We analyze whether, all else equal, local variation in rape culture in the news helps explain why some jurisdictions have more documented rape cases and more arrests than others.

We find that where there is more rape culture, there is more rape. Combining data from F.B.I. Uniform Crime Reports (UCR) and several measures of rape culture in the press, we show that police receive more frequent reports of rape, but also make fewer arrests in response to these reports, in areas where rape culture is more prevalent. We also find that -- because lower police vigilance may deter victims from coming forward, while giving perpetrators a heightened sense of impunity -- the positive association between rape culture and crime most likely reflects an increased incidence of rape, rather than increased reporting by victims.

This relationship is unique to rape. We do not find similar patterns for other violent or non-violent crimes. Our results remain robust after accounting for fixed effects, and a host of potential confounding factors, including local electoral politics, police resources, demographics, economics, and religiosity. We also report an instrumental variable estimate of the “rape culture effect,” exploiting exogenous variation in news content due to shocks to the local media market.

Our findings lend credence to scholars and activists who have argued, to date mostly through case studies, that linkages between culture and crime exist and are consequential for theory and policy. To the extent that rape culture, as reflected in news coverage of rape, can help explain the choices of perpetrators, victims and police, this study highlights a key missing element from economic theories of crime, advancing our understanding of sexual violence and
Causes of rape and sexual violence

Scholarly literature on rape culture is divided across several fields, producing a patchwork of qualitative and experimental results, but little cumulative knowledge. Although policy discourse often assumes that rape culture is harmful to society, scholars have yet to establish an empirical link between gendered media biases and the prevalence of rape.

Economic theories of crime have generated a flourishing literature, illuminating the logic of criminal behavior and exerting an enormous influence on policy (Eide 2006). Economic theories of crime assume that a person commits an offense if the expected utility gained from it exceeds that of investing time and resources into other activities (Becker 1968: 176). As the expected costs of committing a crime increase – that is, as discovery becomes more likely or punishment more severe -- fewer people will commit it. Although such theories offer a simplifying and generalizable logic of violence, they rarely address normative drivers of criminal behavior, the broader cultural context, or the effects of age, race and gender (Eide 2006). Despite the prevalence of economic models of criminal behavior and violence, their application to sexual crime remains nascent (Benson and Zimmerman 2007; Beauregard et al. 2007).

Dominant economic explanations of crime have not fared very well as predictors of rape. While police resources (i.e. staffing, training, equipment) should affect potential perpetrators' expectations of being caught and punished, empirical research finds a much stronger deterrent effect on property crime (Levitt 1997) than on violent crimes like rape (Evans and Owens 2008). The same is true for studies of economic opportunity costs (e.g. unemployment) (Edmark 2005; Levitt 2001) and the informal, self-imposed sanctions and punishments associated with religious adherence (Baier and Wright 2001; Jensen 2006). For other potential predictors of rape -- like

conditions that enable it.
women’s demographic presence and political power (Iyer et al. 2011), or local political values regarding criminal justice (Jost et al. 2003) -- the effect on rape remains uncertain.

*Gendered biases in media coverage of rape.* Existing research suggests why some individuals might commit rape, but overlooks a potentially important source of variation: community norms on gender and sexual violence, and the implicit cues they send to perpetrators, victims and police, as reflected in mass media. Mainstream political science research has not yet addressed the causes or consequences of rape culture in the news media. Most research in this area has studied either wartime sexual violence (Cohen 2013; Wood 2009), peacetime laws prohibiting such violence (Caprioli et al. 2009; Htun and Weldon 2012), or the political effects of gendered customs (Hudson et al. 2012).

While scholars from other social sciences have examined related forms of gendered biases in the media, they have not done so from an economics of crime perspective. For instance, sociologists and psychologists have experimentally investigated exposure to violent pornography (Russell 1988; Malamuth et al. 1986; Kimmel and Linders 1996), while feminist scholars in multiple fields have written about “rape myths,” or false beliefs about rape, in the media (Benedict 1992; Soothill and Walby 1991; MacKinnon 1995). More broadly, sociologists have considered why some micro level cultures and environments become conducive to rape, as with college bars and dorms (Boswell and Spade 1996; Armstrong et al 2006).

Does news coverage shape norms or reflect them? Most research on sexual violence in the media has taken the former view (Benedict 1992). Yet unless potential victims, perpetrators and police all read their local newspapers, it is unclear how newspaper reporting would alter their future behavior. Political communication scholars (Entman 2004; Strömbäck and Dimitrova 2006) have argued that, with relatively rare exceptions, news reporting *reflects* rather than
challenges the normative context within which it is produced. Reporters’ biases mirror the norms of the communities in which they live and work. Their audience, meanwhile, resists frames (i.e. emphases or perspectives on a story) that are unfamiliar or antithetical to their preexisting norms or values. Indeed, research on “selective exposure” (Goldman and Mutz 2011, Iyengar and Hahn 2009) suggests that consumers actively avoid such information. News organizations that feature new or counter-attitudinal frames risk losing their audience, particularly in diverse local news markets where consumers have numerous options (Mutz and Martin 2001).

Our study innovates both theoretically and methodologically. Theoretically, we bridge the gap between literatures on political communication, sexual violence, and economic models of crime, providing a clear logic by which biased news coverage might affect the choices of victims, perpetrators and police. Methodologically, our study is the first to quantitatively establish an empirical link between social norms on sexual violence and the prevalence of rape in society, building on previous studies that have relied either on controlled small group experiments, or qualitative content analysis of a small number of high profile cases over a short time frame.

Rape culture and the incidence of crime: a new model. We introduce a stylized model to assess how the prevalence of rape culture might affect rape outcomes. Following Donohue & Levitt (2001) and Iyer, et al. (2011), we assume that the documented incidence of rape results from an interaction between three actors: perpetrators, victims and police. In the first stage, a perpetrator decides whether to commit rape. If a rape occurs, the victim decides whether to contact the police. If the victim does so, the police decide whether to arrest the perpetrator.

This interaction produces four possible outcomes: (1) the perpetrator does not commit rape, (2) the perpetrator commits rape, but the victim doesn’t report, (3) the perpetrator commits rape, the victim reports, but the police make no arrest, and (4) the perpetrator commits rape, the
victim reports, and the police make an arrest. The prevalence of rape culture in the community affects all three actors' preferences over these outcomes and, by extension, the probability that each occurs.

**Police.** By backward induction, the perceived likelihood that law enforcement will pursue a rape allegation affects decisions both to commit and report the crime. The police have limited resources and are more likely to make an arrest if they view the allegation as credible. In a cultural environment that blames victims for their violations and empathizes with perpetrators, police may be more likely to scrutinize the victim's account, more wary of making a false arrest, and more likely to drop cases early in the criminal justice process (Schuller and Stewart 2000; Jordan 2006). Where rape culture is less pervasive, police may be more likely to believe the victim's account, conduct a full investigation, and arrest the accused perpetrator. Higher levels of rape culture should be associated with decreased police vigilance in investigations of rape cases.

**Victims.** For survivors of rape, decisions to report violations depend on several factors, like fear of reprisal, trauma of the attack, their relationship to the perpetrator and their trust in local law enforcement, including the authorities' anticipated responses. Assuming that victims seek increased security or justice, they will generally (but not always) prefer an outcome of police making an arrest following a report over either no arrest or no report. The greater the victim’s expectation of an arrest, the stronger will be their incentive to report the crime. If rape culture is pervasive, and victims perceive police as unlikely to bring alleged rapists to justice, victims are less likely to report (ibid), and may prefer no investigation or arrest.

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1 Research suggests that women are more likely to report their rape if they experienced high levels of violence and injuries, and if a weapon was used (Pino and Meier 1999). In addition, a victim raped by a relative or acquaintance is less likely to report (ibid), and may prefer no investigation or arrest.
they may anticipate greater utility from remaining silent than from coming forward.

In addition to lowering expectations of successful prosecution, media coverage that blames the victim or otherwise questions their credibility or account -- while also potentially revealing the victim’s identity -- makes reporting a violation costly. A victim in a high rape culture context may conclude that the least costly outcome -- with the least expected damage to dignity and reputation -- is to forgo reporting the crime. Higher levels of rape culture should be associated with decreased reporting of rape by victims.²

Perpetrators. Individual decisions to engage in criminal activities depend, at least in part, on the perceived probability of being caught, and the severity and immediacy of punishment. We assume that perpetrators prefer committing the offense without reports or arrests over not offending, and prefer not offending over doing so and being punished. The costs of rape therefore depend on how victims and police respond.

Where rape culture is limited, potential perpetrators may expect a relatively high probability of detection and arrest. Here, police are more likely to vigilantly pursue victims' allegations, and victims are more likely to come forward. Where rape culture is more prevalent, the expectation of social victim blaming and an implicit bias in favor of perpetrators might reduce the expectation of arrest and severity of punishment, reducing the expected costs of rape.³

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² Studies have found that victims who accept rape myths are less likely to report their rape (Egan and Wilson 2012).
³ Research shows that perpetrators use strategies to avoid being caught, targeting acquaintances instead of strangers and drugging victims before the assault (Lisak and Miller 2002), and that rape is more common among vulnerable groups, who are less likely to report crimes and may face challenges pursuing conviction (Greenfeld and Smith 1999; Tjaden and
Higher levels of rape culture should increase the likelihood that perpetrators commit rape.

*Empirical implications.* The previous discussion implies that higher levels of rape culture should be associated with a higher incidence of rape. Yet an increase in documented cases could result from either a higher incidence of rape, or from more reporting by victims.

To empirically distinguish between these two possibilities, we examine the number of rape reports that result in arrests. We expect that where rape culture is high, a lower number of victims' reports should result in arrests. Victims are thus less likely to report the crime, and perpetrators more likely to offend. Consequently, if we observe lower police vigilance in high-rape culture contexts, we can have greater confidence that increases in crime, rather than in victims’ propensities to report crimes, accounts for increases in documented rape cases.

**Measuring rape culture**

To evaluate the empirical relationship between rape culture and rape, we assembled an original dataset of news coverage of sexual violence. The dataset measures whether a newspaper published a story about rape on a given day, and whether the content of that news story (or stories) demonstrates evidence of rape culture, as commonly defined in the academic literature and by subject matter experts. By connecting newspapers to communities that either produce or consume their coverage, we estimate the existence and extent of rape culture at the local level.

*Data collection.* We reviewed all daily and weekly U.S. newspapers listed in Lexis-Nexis -- most of them local -- and coded every article mentioning the keywords “rape” or “sexual assault.” While news coverage appears in various forms of electronic and print media, we focus on newspapers due to their prevalence as primary sources of local information on political, economic and social events, and the ability to collect a consistent and representative data sample.
across the largest possible set of geographic units. We also collected information on each newspaper’s average daily circulation by county, and the physical address of the main bureau.

Our corpus includes 310,938 articles published in 279 newspapers. The median newspaper published 52 articles about rape between 2000 and 2013, including both news content and opinion-editorials. The *Washington Post* and *New York Times* featured the most coverage, with over 20,000 pieces each, followed by the *St. Louis Post Dispatch*, *Washington Times* and *New York Daily News*. 143 newspapers published fewer than 10 stories, and 49 published just one.

**Measurement.** Rape culture is difficult to quantify because most existing definitions are imprecise. Our review of previous work revealed convergence around four main categories: (1) victim-blaming language, (2) empathy for perpetrators, (3) implied victim consent and (4) questioning of victims’ credibility. These categories feature prominently in toolkits and guidelines

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4 While the Internet is emerging as a critical news source, a disproportionate share of online news originates with newspapers. As of August 2015, 10 of the 15 most popular Internet news sources either were online versions of print newspapers or featured aggregated content from newspapers (ebizMBA.com, accessed August 28, 2015). Along these lines, Fraile (2011) finds that newspapers have a larger effect on political knowledge than other media, like television.

5 Even archetypal national papers, like the *New York Times* have strong local components. In “local” or “metro” sections, these outlets feature in-depth coverage of local and regional issues and events. Local residents and businesses also account for the bulk of their print subscriptions.

6 While much newspaper coverage of rape focuses on high-profile national or international cases, local editors retain discretion over which wire service stories they print and thus even international stories can reveal local cultural attitudes about rape.
for journalists (Garcia-Rojas 2012; Dart Center for Journalism and Trauma 2011), and have dominated public discourse on recent controversies. Although there is broad consensus about these categories, they are quite general and each potentially includes a wide range of sentiments.

To develop and refine a coding instrument around these categories, we solicited feedback from two dozen experts, including academic researchers, journalists, activists, and practitioners. Through these consultations, we derived a series of components associated with our four main categories of rape culture, summarized in Table 1. We organized the coding instrument as an annotated 76-question online survey form (see online appendix).

[Table 1]

We used supervised machine learning to classify each news story into these categories, based on a training set of randomly-selected reference articles manually classified by research assistants (RAs). Our team of twelve RAs created a combined training set of 23,042 manually coded newspaper articles. Intercoder reliability statistics, based on 276 articles that overlapped across all twelve coders, meet or exceed conventional standards of agreement, with Krippendorf Alpha statistics positive and statistically significant for the main categories of interest (online appendix). In addition, we asked coders to indicate whether each article addressed a specific

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7 Following initial training and orientation, each RA received a common set of 50-100 random articles, which they classified according to our coding instrument. We analyzed the RA-generated data and met with coders to identify potential points of confusion and provide early corrective feedback. Next, the RAs received multiple larger training sets of 500 articles each, including a subset of overlapping articles to facilitate inter-coder reliability diagnostics. The team met bi-weekly, to reach a common conceptual understanding and identify difficult cases.

8 Although our coding instrument identifies 76 discrete dimensions of rape culture, we
case of rape, rather than general crime statistics or unrelated topics ("Wrong topic"), and whether the text contained errors or was otherwise incomprehensible ("Errors").

With these training data, we used a Support Vector Machine (SVM) classifier to assign each document to the categories in Table 1. To optimize classification performance, we weighted the features in the document-term matrix by term frequency/inverse document frequency and normalized word counts (Rennie et al. 2003; Salton and Buckley 1988). We excluded documents classified by the algorithm as containing “Errors” or “Wrong topics.”

**Overview of rape culture in the press.** Along with the four main categories of rape culture, we include a combined variable, coded 1 if an article contained *any* of the four types of coverage. Overall, rape culture is relatively rare in the news. The SVM algorithm classified about three percent of rape-related stories as containing any of the four components of rape culture. The most common sub-category was victim blaming (1.3 percent), and least common was incredulity toward victims (0.5 percent). In practical terms, the average U.S. county saw 417 newspaper articles about rape per year, 12 of which featured some element of rape culture.

Figure 1 presents several patterns using wordclouds of articles in each category, with font

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9 For overlapping articles, we used median values for each variable, equivalent to majority vote.

10 The mean and standard deviations for our four rape culture indicators, and the summary variable (all of which are dummies with medians of 0) are as follows: Victim-blaming language: .032 (.175), Empathy for the accused: .008 (.091), Implied consent: .010 (.097), Questioning victim’s credibility: .005 (.070), and Any rape culture: .032 (.175).
size proportional to the relative frequency of a term. Articles in which the SVM algorithm
detected no rape culture (upper left) focus primarily on police investigations and judicial
proceedings, with terms like “police,” “charg[es]” and “sentence” in large font. By contrast,
articles containing at least one of the four categories (upper right) featured noticeably fewer
terms related to police investigations, and more on the individuals at the center of the case
(“woman,” “player,” “team”). Key terms like “victim” and “sexual” “assault” -- which featured
prominently in the upper-left wordcloud -- are relatively rare in these articles.

The remaining wordclouds disaggregate the four categories. Victim-blaming language
(middle-left) focuses on the circumstances of the incident, particularly those that might cast doubt
on the victim's physiological state (“drink,” “parti[es],” “alcohol”). Empathy for the accused
(middle-right) features terms associated with athletic institutions (“player,” “team,” “coach,”
“football,” “season”) and standards of evidence (“evid[ence],” “innoc[ent],” “test”). Articles that
imply consent (lower-left) are more likely to mention a “sexual” “relationship” between victim and
accused, particularly in an educational setting (“student,” “teacher,” “school”). Finally, articles that
question a victim's credibility (lower-right) emphasize the victim's account of events (“accus[e],”
“alleg[e]”) during adversarial court proceedings (“defens[e],” “prosecutor”).

[Figure 1]

To analyze the relationship between rape culture and crime, we aggregated these article-
level indicators to the county-year level, as proportions of newspaper stories in the local media
market containing each category of rape culture. We matched newspapers to counties in two
ways. First, we examined communities that produce the news (content producers), with a
weighted average of rape culture scores based on the geographic proximity of each outlet's main
bureau to the county center. Second, we examined trends in communities that consume the news (*content consumers*), with a weighted average based on the market share of each newspaper in the county, according to circulation data from the Alliance for Audited Media.

Figures 2a and 2b show the geographic distribution of rape culture in newspaper articles according to these two measures, averaged over 2000-2013. The percent of local news stories about rape containing rape culture language ranges from 0 (dark blue) to 5 (bright yellow).

The two maps convey different distributions of biased news coverage across the United States. According to the “content producers” measure, areas with highest prevalence of rape culture (yellow) include the Mountain States, parts of central California and the Upper Midwest. Of 100 counties with the highest levels of rape culture, 52 were located in Minnesota and Iowa, 13 were in North Carolina and 10 were in California. Conversely, the Midwestern states of Indiana, Ohio and Michigan had relatively low prevalence of rape culture; these three states include 75 of the 100 counties that scored lowest on the index (blue).

The county map based on newspaper circulation rather than home bureau location (Figure 2b, “content consumers”) offers a more conservative estimate of local rape culture in the press. Although some areas of high rape culture overlap with those in Figure 2a, such as the Upper Midwest, Mid-Atlantic and parts of California, there are also significant disparities across the two maps, such as in the Mountain States and Florida. To ensure that our results are not artifacts of geocoding, we conduct all analyses separately for these two measures of local rape culture.

[Figure 2a and 2b]

Figure 2c shows the distribution of reported “forcible rapes” per 1,000 county residents,

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11 We used the inverse distance between each county center and a newspaper's main bureaus as weights, giving more influence to stories from newspapers based nearby.
from the FBI's Uniform Crime Reports (UCR) statistics, averaged over 2000-2013. Figure 2d shows the difference between arrest rates and rape reports, with higher numbers (yellow) indicating higher police vigilance, and lower, negative numbers indicating lower vigilance.

Descriptive statistics appear to support our expectation of a positive relationship between rape culture and the reported incidence of rape. According to the “producers” measure, in county-years with above-average rape culture in local newspapers (greater than 3 percent), there were 93 percent more reported rapes than in county-years with below-average rape culture (0.93 vs. 0.50 rapes per 1,000 residents per year, respectively, p<.001). The difference for the “consumers” measure is much smaller (1 percent, p<.001), but also statistically significant.

An even stronger relationship appears between rape culture and local police vigilance. In counties with higher-than-average rape culture, between 1 and 2 additional reported rapes per year did not result in arrest, according to the “producers” measure. According to the “consumers” measure, there were as many as 8 additional reports without arrests per year. Where rape culture is prevalent, there are more reported rape cases, but fewer reports result in arrests.13

The strength of this relationship, however, is difficult to discern from summary statistics. Rape, like other violent crime, results from multiple local economic, demographic and cultural factors.

12 The FBI defines “forcible rape” as “penetration... of the vagina or anus with any body part or object, or oral penetration by a sex organ of another person, without the consent of the victim.” (FBI, 2014). Before 2012, the FBI used a narrower interpretation of “forcible rape,” delineating it as “the carnal knowledge of a female forcibly and against her will” (FBI, 2014).

13 Kolmogorov-Smirnov test statistics for the “producers” and “consumers” measures are .04 (p<.001) and .03 (p<.001) for rape reports and .03 (p<.001) and .04 (p<.001) for police vigilance.
risk factors, and any positive correlation between rape culture and rape might disappear once we account for these confounders. The correlation may also reflect heightened media attention to rape in locations with relatively high preexisting rates of sexual violence. If so, then a third, potentially unobserved factor may be driving variation in both press coverage and crime. To account for these and other possibilities, we perform a series of more rigorous empirical tests.

**Regression Analysis**

We examine whether and how rape culture in local print media drives the reported incidence of rape in the United States. Our core model specification is as follows:

\[
\ln(y_{it}) = \rho' C_{it-1} + \gamma' y_{it-1} + \beta' X_{it} + \alpha_i + u_t + \epsilon_{it}
\]  

(1)

where \(y_{it}\) is the number of reported rapes per 1,000 residents in county \(i\) in year \(t\). The covariate of central interest, \(C_{it-1}\), is the proportion of local newspaper articles on rape published in the previous year containing one or more of the rape culture categories listed in Table 1. In separate models, we consider both the combined “Any rape culture” variable, as well as its four components. The coefficient \(\rho\) captures the impact of such coverage on local crime.

In addition to rape culture, we control for several covariates, \(X_{it}\), which correspond to the previously discussed alternative explanations of crime. These include median personal income (proxy for police resources), unemployment, female share of the population, religious affiliation and political party vote during the last presidential election (summary statistics in online appendix). Admittedly, these controls include only a fraction of potential determinants of rape, and omit important yet endogenous factors, like local resources for survivors and sex crime units -- which may correlate with both local crime levels and local news coverage. To account for these omitted and difficult-to-measure variables, and other differences across space and time, we include county and year fixed effects, \(\alpha_i\) and \(u_t\), and county-level clustered standard errors.
Endogeneity is an important concern in studying the effect of media coverage on rape. Because news coverage is event-driven, local crime trends likely influence the scope and content of news stories about rape. We address this issue in two ways. First, we lag our rape culture variables by one year to avoid contemporaneous feedback from crime to news. Second, we consider a separate specification employing changes in local newspaper circulation as an instrumental variable for rape culture. Assuming that shocks to the local print media market are unlikely to affect crime rates, except through their impact on news content, this approach, detailed below, allows us to exploit an exogenous source of variation in rape culture.

*Is there more rape where there is more rape culture?* The first two columns of Table 2 report the results of the model in equation (1), for reports of rape at the county-year level. Model 1 presents estimates for communities based on newspaper home bureau locations (“producers”), and Model 2 presents estimates based on circulation (“consumers”). Results for victim-blaming and other components of rape culture, reported in the online appendix, are consistent with those for the general measure shown here. The standardized coefficients represent the impact of a standard deviation increase in each variable on a standard deviation change in the outcome.

[Table 2]

The prevalence of rape is significantly higher where there is more rape culture in the local press. The size of this impact varies across the two measures, but its direction is the same. A standard deviation increase above the mean in “Any rape culture,” yields a 3.4 percent increase (95% CI: 2.2, 4.6) in reported rapes per year according to the “producers” measure, and a 2 percent increase (95% CI: .73, 3.2) according to the “consumers” measure.¹⁴

What do these numbers mean in practice? A standard deviation increase in rape culture is

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¹⁴ The SD shift is from .03 to .05 for “producers” and from .007 to .023 for “consumers.”
equivalent to 8 additional newspaper articles per county-year. Considering that the average county saw only 12 articles with rape culture in a given year, such an increase would represent a substantial shift in community norms. The impact of this increase is, on average, one additional rape case per thousand local residents in the following year.

Rape culture is a stronger predictor of reported rapes than several widely cited variables, like unemployment and the male-to-female ratio, but the size of the effect is modest. Even the largest standardized coefficient for rape culture variables is one-tenth of that for income or religiosity. By itself, rape culture cannot explain fundamental differences between high and low-incidence counties. But it is nonetheless a consistent and meaningful contributing factor.

*Exogenous variation in rape culture.* Rape culture may correlate with increases in documented rape cases, but this result reveals little about the direction of the relationship. It is possible that there is simply less sensitivity among journalists where rape is more common, or that some other, unobserved factor drives both local news content and sexual violence. We thus consider another specification of the model in equation (1), employing changes in the average daily circulation of local newspapers as an instrument for rape culture in the media.

Circulation shocks are a valid instrument because newspapers adapt the content of their coverage in response to market pressures, but market pressures are unlikely to affect crime rates, except through their effect on news coverage. The relationship between market incentives and media bias is a subject of ongoing debate in political science and economics (Gentzkow & Shapiro 2010; Gurun & Butler 2012). This research assumes that news organizations modify coverage to optimize readership, but disagrees on whether market pressures create cutbacks in reporting and editorial quality (Zaller 1999), or increase the diversity of published opinions (Gentzkow & Shapiro 2008). In each case, market pressures create incentives against news
coverage that alienates marginal consumers -- the readers *most* likely to cease consuming if displeased with content, and whom publishers can *least* afford to lose (Hamilton 2004).

Who are these marginal consumers today? In the last decade, the print media market has steadily declined across the United States. According to the Pew Research Center’s Biennial Media Consumption Survey, media consumers who report reading a daily newspaper “Sometimes” or “Regularly” declined from 80 percent in 2004 to 67 percent in 2012. One of the few groups bucking this trend is unmarried women, with “Sometimes” or “Regular” levels of readership rising from 8.5 to 10.5 percent over the same eight years. If unmarried females are more attentive to press coverage of gender issues than are consumers less essential to newspapers’ bottom lines, outlets in declining local markets should be less likely to feature coverage with gendered biases about rape.15

Rape culture is indeed more common where market pressures are less severe. The proportion of newspapers with “Any rape culture” is significantly higher in counties where newspaper readership increased or stayed constant from year-to-year, and lower where readership declined.16 Rape culture is also lower where single women are more important to

15 A 2011 Pew Center survey supports this conjecture. It asked respondents how closely they were following “The arrest of the International Monetary Fund chief in New York City on accusations of attempted rape.” Unique among the events included in the survey, women under age 30 who reported living alone were *more* likely to report having followed the case “very” or “fairly” closely than their under 30, living alone, male counterparts.

16 We define a “decline in readership” in two ways: as a negative change in the average self-reported frequency of newspaper readership (i.e. from “Regularly” to “Sometimes,” “Sometimes” to “Hardly ever,” etc.), or as a decline in the proportion of local survey respondents who reported reading a newspaper “yesterday.” According to the two measures, there were 141
newspapers' bottom lines. Where a higher-than-average proportion of readers were single women, there was far less rape culture in local newspapers than one would expect by chance.\(^{17}\)

The rape-culture-inhibiting effect of unmarried female newspaper readership dramatically strengthens in more competitive markets, with more than one newspaper based in the county (see online appendix). If declining markets and heightened competition indeed reduce gendered biases in the media, we can exploit this variation to identify the effect of rape culture on crime.

Models 3 and 4 in Table 2 report the results of the instrumental variable regressions, estimated by two-stage least squares (2SLS) with county and year fixed effects. Test statistics for underidentification, overidentification and weak instruments all fall within conventional bounds of significance.\(^ {18}\) For both measures of rape culture, the 2SLS coefficients are substantially larger than the reduced form estimates in Models 1 and 2. While a one standard deviation increase above the mean in “Any rape culture” previously produced a 3.4 or 2 percent rise, respectively, for the “producers” and “consumers” measures, the same counterfactuals yield increases of 81 (95% CI: 55, 108) and 201 (95% CI: 88.4, 314) percent in the 2SLS specification.

Figure 3a shows this result broken down for each component of rape culture, the colored (expected: 153) and 103 (116) counties with both a decline in readership and higher-than-average rape culture, with both Pearson Chi-squared tests significant at p<.10.

\(^{17}\) There were 102 (expected: 121) counties with above-average proportions of single, female newspaper readers (“Sometimes” or “Regular”) and above-average rape culture, compared to 179 (160) with below-average rape culture. Chi-squared statistics were significant at p<.01.

\(^{18}\) The F statistic for the Kleibergen-Paap rk LM underidentification test is high for all models, indicating that the circulation instrument correlates with rape culture, and allowing us to reject the null hypothesis that this correlation is weak.
areas representing the density of the distribution of each standardized coefficient, and black
vertical dashes representing point estimates, 90% and 95% confidence intervals. The impact of
rape culture on rape is more robust in communities that produce biased news coverage than in
communities that consume this coverage, but general patterns are the same. For the “producers”
measure, every category of rape culture yields a positive and significant association with rape,
with some minor differences in magnitude. For the “consumers” measure, “Empathy for the
accused” was the only subcategory with a strong, positive relationship to reported rapes.

[Figure 3]

The instrumental variable results suggest that direction of bias due to endogeneity is the
opposite of what one would expect if news outlets in high-rape areas were systematically more
skeptical toward victims' accounts and more supportive of the accused. Instead, we see
heightened sensitivity and caution among news outlets in such markets. Where there is more
rape, journalists and editors seem to produce less news coverage that might increase it.
Therefore, reduced form estimates understate the true magnitude of the rape culture effect. When
we purge these estimates of their correlation with the error term, the size of the effect spikes.

To be clear, our results do not suggest that the publication of several newspaper articles
can have a massive impact on crime. The net effect of a standard deviation increase in rape
culture is between two and five additional reported rapes per thousand residents in a county year.

*Does rape culture increase the incidence of rape, or victims' reporting, of rape?* An
increase in documented rape cases may reflect either a true increase in rape incidence, or an
increase in victims’ reporting. Only the former case is consistent with our expectation that rape
culture emboldens perpetrators and deters victims from coming forward. Here, rape culture in the
media reflects local norms that fail to deter potential perpetrators, and this increased incidence is
sufficient to offset decreases in reporting by victims. If the latter case is true, then rape culture may motivate outraged victims to come forward.

To determine which of these two stories is more plausible, following Donohue and Levitt (2001), we reexamine the incentives facing perpetrators, victims and police. If our theory is valid, then rape culture should produce the following interaction (working backwards): police are less likely to make arrests; observing a low probability of justice, victims are less likely report crimes; observing a low probability of punishment, perpetrators are more likely to offend. Since expectations of police behavior drive others' choices, the empirical challenge is to establish how police react to victims' reports.

In approaching this question empirically, an analysis of per capita arrest rates by themselves does not necessarily capture the vigilance of police -- there may simply be more arrests per capita where there are more reports per capita. A more revealing measure of vigilance is the *difference* between rates of rape-related arrests and reports. Where this number is high and positive, police are highly vigilant, arresting more suspects than there are reports. Where this number is negative, there are fewer arrests than reports, and police vigilance is low.

We model the determinants of high police vigilance in a county-year using the same general specification as before, with county-level arrest-report differences as the new dependent variable. The right hand side variables and fixed effects are the same as those in equation (1). As in the previous section, we use local circulation change as an instrument for rape culture.

The last four columns of Table 2 report the determinants of police vigilance in rape cases, in both reduced form (Models 5 and 6) and instrumented (Models 7 and 8). Figure 3b also reports instrumented standardized coefficient estimates for every component of rape culture.

According to the “producers” measure, there is a negative and statistically significant
relationship with police vigilance for every category of rape culture except victim-blaming language. A standard deviation increase in “Empathy for the accused,” for instance, yields a .15 standard deviation decrease in police vigilance, equivalent to 10 fewer rape cases with no perpetrators arrested (95% CI: -19.6, -1.46) per county-year. Results for the “consumers” measure are similar in direction and magnitude, with the same increase in “Empathy” producing 11 fewer reported cases with arrests (95% CI: -21.7, -.83) per county-year.

The difference between arrests and reports may reflect not only the willingness to make arrests, but also police resources, electoral politics or other confounding factors. As Table 2 shows, police vigilance in rape cases is significantly lower in Republican-leaning counties, and -- depending on the specification -- in counties where unemployment and religiosity are high. Yet the impact of rape culture on police vigilance still holds after accounting for these and other, unobservable characteristics captured by county and year fixed effects.

One additional concern is that lower police vigilance may not be unique to sexual crimes, and that police in communities with high rape culture may be generally having trouble following up on crime reports. To investigate this possibility, we replicated Models 7 and 8 for other categories of violent and property crime. Figure 3c shows that the negative association between rape culture and police vigilance does not emerge for murder, where under-reporting is less of a concern, or robbery, a non-sexual, opportunistic crime. In neither case does rape culture have a discernible effect, for either the general measure of rape culture, or its subcategories. Given that police vigilance is generally higher for murder and robbery than for rape -- with 18 and 12 percent of county-years, respectively, with more arrests than reports, compared to 7 percent for rape -- the negative impact of rape culture is even more compelling. Unless victims are most likely to seek justice in places where they know it is most elusive, variation in documented rape

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cases more likely reflects a true increase in rapes rather than a rise in victims’ reporting.

*Caveats.* While our study represents an important first step, it has a number of limitations, each of which suggests potential areas for future research. First, despite our consultation with numerous experts, many of the specific elements of our rape culture instrument are not without controversy. The significance (Luciano 2015), and even *existence* (Kitchens 2014) of rape culture are both contested, and our measure is based on only one potential source -- news coverage. Future work might gather data on other county-level measures of culture, such as surveys about attitudes toward rape or local school curricula on sexual violence.

Second, additional work is needed to validate our instrument for rape culture. For instance, longitudinal data on individual newspaper demographics may help determine the nature of market incentives facing newspaper owners. Third, official crime statistics are imperfect, and may not accurately measure the true frequency of the crime of rape. Future research may reveal alternative means of triangulating, if not necessarily directly measuring, the frequency of such crimes. Finally, it is important to assess, ideally through controlled experiments, whether and to what extent rape culture actually produces individual-level effects (in terms of attitudes and behavior) that correspond to our observational, aggregate-level findings.

**Conclusion**

How common is rape culture? Does it alter the propensities of perpetrators to commit rape, of victims to report crimes to police, and of police to follow through on victims’ reports and make arrests? To answer these questions, we investigated the extent of rape culture in the print media at an unprecedented level of breadth and depth. We developed a uniquely comprehensive and transparent measure of rape culture that incorporates existing conceptual definitions, and four key constituent categories: victim-blaming language, empathy for the
accused, implications of consent, and incredulity toward victims.

Where there is more rape culture, there is more rape, but also less vigilance among local police. This finding, and our broader attempt to empirically assess rape culture represents an important step forward for social science research on sexual violence, and for the broader debate. Our research can potentially help journalists and editors uncover implicit biases in their work, allow policymakers to gauge police responsiveness, help activists devise methods to reduce sexual violence, and enable scholars to systematically investigate it. Our findings validate long-standing concerns that some social norms can enable, or at least fail to deter, sexual violence.

A variety of tests aimed at establishing not only a correlation, but also the direction of causality, tell the same story: rape culture is more likely to *cause* rape reports than to be caused by them. These patterns emerge across both reduced form and instrumental variable estimates that exploit fluctuations in newspaper circulation as an exogenous source of variation in rape culture. Our indirect tests of alternative causal pathways also suggest that rape culture drives the actual frequency of rape, rather than the propensity of victims to report it. We did not find a similar relationship for other crimes, like murder or robbery. Local community norms and biases, as reflected in this news reporting, appear to have a non-trivial impact on sexual crime.

Even if we stipulate that rape culture is both real and significant, there likely exists no unimpeachable and entirely exogenous empirical measure of it. Our approach has been to rely on the collective judgments of experts, maximize the transparency of measurement and analyses, test hypotheses against both aggregated and disaggregated measures of rape culture, conduct parallel tests of leading alternative explanations, and allow readers to judge for themselves. While some of these alternatives -- like local politics and religiosity -- help account for variation in rape rates, so too did our indicators of rape culture in the media.
This study contributes to a number of important strands in the social science literature. First, we demonstrate that economic models of crime have largely overlooked the role of culture, a key element in understanding the causes and consequences of rape. We show that the connection between culture and crime exists and is consequential for theory and policy. Second, we advance the literature on gendered violence, which has failed to propose a robust economic model of sexual violence. By focusing on one particularly egregious crime in the US context, we bring together insights from criminology, gender studies, political communication and political science to present a novel argument about the choices of potential perpetrators, police, and victims. Finally, this work joins other recent studies that analyze large amounts of text data to understand patterns in printed news media (e.g., Shor et al. 2015). Building on this previous research, our study is the first to demonstrate a broader, systematic link between community norms about sexual violence and the prevalence of rape in society.

Although our results confirm the worst fears of many observers, they can potentially help shift the study of rape culture away from the obscurity of ivory tower debates and internecine discussions among activists, and firmly into the domain of empirical social science and evidence-based policymaking. Rape culture has devastating consequences, and a better understanding of its effects is the first step toward change.
References


U.S. Department of Justice, Bureau of Justice Statistics.


Levitt, Steven. 1997. “Using Electoral Cycles in Police Hiring to Estimate the Effect of Police on


FIGURE 1. Wordclouds.

No rape culture

Any rape culture

Victim-blaming language

Empathy for accused

Implication of consent

Questioning victim’s credibility

Notes: Font size proportional to term frequency/inverse document frequency.
FIGURE 2. Geographic distribution of rape culture (a and b), reported rape (c) and police vigilance in rape cases (d).
FIGURE 3. Impact of rape culture on crime.

(a) Rape culture and documented rape cases, standardized coefficients (instrumented)

(b) Rape culture and police vigilance in rape cases, standardized coefficients (instrumented)

(a) Police vigilance for other categories of crime, standardized coefficients (instrumented)
<table>
<thead>
<tr>
<th>Category of bias</th>
<th>Individual components</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Victim-blaming language</td>
<td>Clothing, makeup of victim</td>
</tr>
<tr>
<td></td>
<td>Victim’s physiological state at time of incident (e.g. drunk, high, had consumed alcohol)</td>
</tr>
<tr>
<td></td>
<td>Victim’s former/current job as a sex worker or prostitute</td>
</tr>
<tr>
<td></td>
<td>Victim’s sexual history or promiscuity</td>
</tr>
<tr>
<td></td>
<td>Victim’s upbringing as explanation for current behavior (e.g. absentee parents, socioeconomic status)</td>
</tr>
<tr>
<td></td>
<td>Locations that suggest victim culpability (e.g. victim had invited accused into own home)</td>
</tr>
<tr>
<td></td>
<td>Use of loaded terms to describe rape self-reporting (e.g. the victim “complained”, “admitted”, “confessed”)</td>
</tr>
<tr>
<td>2. Empathy for perpetrators</td>
<td>Mitigating factors and circumstances for accused (e.g. rape is “predictable outcome” of war, sports, substance abuse, age)</td>
</tr>
<tr>
<td></td>
<td>Focus on suffering of the community as opposed to the victim</td>
</tr>
<tr>
<td></td>
<td>Accused's promising future is now at risk (e.g. hopes dashed for honor-roll student, star athlete)</td>
</tr>
<tr>
<td></td>
<td>Accused has high credibility or stature in the community</td>
</tr>
<tr>
<td></td>
<td>Accused was the target of an unfair trial or overzealous prosecution</td>
</tr>
<tr>
<td>3. Implication of consent</td>
<td>Absence of physical resistance on part of victim</td>
</tr>
<tr>
<td></td>
<td>Description of long-term abuse as an “affair” or a “sex scandal”</td>
</tr>
<tr>
<td></td>
<td>Description of victim’s past romantic relationship with the perpetrator</td>
</tr>
<tr>
<td></td>
<td>Rape is referred to as “sex”, “intercourse” or non-specific terms that diminish the force of rape</td>
</tr>
<tr>
<td>4. Questioning victim’s credibility</td>
<td>Victim's past criminal record</td>
</tr>
<tr>
<td></td>
<td>Inconsistencies in victim's account</td>
</tr>
<tr>
<td></td>
<td>Victim’s past or current history of substance abuse</td>
</tr>
<tr>
<td></td>
<td>Victim’s mental health</td>
</tr>
<tr>
<td></td>
<td>Time elapsed between rape and report of rape; failure to report previous instances of abuse</td>
</tr>
<tr>
<td></td>
<td>Ulterior motives on the victim’s part (e.g. divorce proceedings)</td>
</tr>
<tr>
<td>5. Additional items</td>
<td>Privacy information of victims and perpetrators (name, age, address, profession, religion, sexual orientation, celebrity status, incest/blood relations)</td>
</tr>
<tr>
<td>(full list in online appendix)</td>
<td>Overly graphic depiction of an attack</td>
</tr>
<tr>
<td></td>
<td>Rape as an incident of domestic violence</td>
</tr>
<tr>
<td></td>
<td>Rape discussed in the context of abortion (pro-life/pro-choice debate)</td>
</tr>
<tr>
<td></td>
<td>Rape as an exceptional or ‘monster’ case</td>
</tr>
<tr>
<td></td>
<td>Rape as a symptom of systemic failure</td>
</tr>
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</table>
TABLE 2. Determinants of rape reporting (1-4) and police vigilance (5-8).

<table>
<thead>
<tr>
<th>Model</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
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<tr>
<td><strong>Dependent variable:</strong></td>
<td>Reported rapes per 1,000 people, log</td>
<td>Arrest to report difference per 1,000 people</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
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<td><strong>Measure:</strong></td>
<td>prod.</td>
<td>cons.</td>
<td>prod.</td>
<td>cons.</td>
<td>prod.</td>
<td>cons.</td>
<td>prod.</td>
<td>cons.</td>
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<td>Any rape culture (t-1)</td>
<td>0.020***</td>
<td>0.013***</td>
<td>0.50***</td>
<td>1.38***</td>
<td>-0.008***</td>
<td>-0.0031</td>
<td>-0.23*</td>
<td>-0.18*</td>
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<td></td>
<td>(0.0036)</td>
<td>(0.0031)</td>
<td>(0.083)</td>
<td>(0.40)</td>
<td>(0.0019)</td>
<td>(0.0024)</td>
<td>(0.11)</td>
<td>(0.086)</td>
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<td>Median personal income</td>
<td>0.38***</td>
<td>0.38***</td>
<td>0.40***</td>
<td>0.37***</td>
<td>-0.0049</td>
<td>-0.0053</td>
<td>-0.017*</td>
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<td></td>
<td>(0.012)</td>
<td>(0.022)</td>
<td>(0.015)</td>
<td>(0.027)</td>
<td>(0.0061)</td>
<td>(0.0066)</td>
<td>(0.0093)</td>
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<td>Percent female</td>
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<td>0.0024</td>
<td>-0.012</td>
<td>-0.012</td>
<td>0.00088</td>
<td>0.00070</td>
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<td></td>
<td>(0.0070)</td>
<td>(0.0100)</td>
<td>(0.0091)</td>
<td>(0.014)</td>
<td>(0.0037)</td>
<td>(0.0033)</td>
<td>(0.005)</td>
<td>(0.0044)</td>
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<td>Percentage of workers unemployed</td>
<td>0.042***</td>
<td>0.038***</td>
<td>0.16***</td>
<td>0.084***</td>
<td>-0.0082'</td>
<td>-0.0068</td>
<td>-0.029*</td>
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<tr>
<td></td>
<td>(0.0094)</td>
<td>(0.010)</td>
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<td>(0.021)</td>
<td>(0.0050)</td>
<td>(0.0057)</td>
<td>(0.012)</td>
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<td>Percent population in religious congregation</td>
<td>0.40***</td>
<td>0.40***</td>
<td>0.28***</td>
<td>0.24**</td>
<td>-0.037*</td>
<td>-0.038*</td>
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<td>(0.030)</td>
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<td>(0.047)</td>
<td>(0.081)</td>
<td>(0.016)</td>
<td>(0.018)</td>
<td>(0.051)</td>
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<td>Percent presidential vote for Republican</td>
<td>0.20***</td>
<td>0.19***</td>
<td>0.38***</td>
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<td>0.10***</td>
<td>0.12***</td>
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<td>(0.0073)</td>
<td>(0.0072)</td>
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<td>(0.0090)</td>
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<td>Arrest to report diff. per 1,000 people (t-1)</td>
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<td>0.63***</td>
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<td>0.038***</td>
<td>0.040***</td>
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<td>(0.014)</td>
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<td>(0.0050)</td>
<td>(0.0071)</td>
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<td>0.040***</td>
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<td>(0.014)</td>
<td>(0.013)</td>
<td>(0.0071)</td>
<td>(0.0050)</td>
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<td>37,244</td>
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<td>40,348</td>
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<td>County &amp; Year FE</td>
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<td>YES</td>
<td>YES</td>
<td>YES</td>
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<td>29.8</td>
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<td>Anderson-Rubin F</td>
<td>53.3***</td>
<td>43***</td>
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<td></td>
<td>5.98*</td>
<td>5.16*</td>
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<td>Stock-Wright LM S</td>
<td>53.2***</td>
<td>42.9***</td>
<td></td>
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<td>5.98*</td>
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<td>Kleiberger-Popp LM</td>
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<td>29.8</td>
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</table>

Notes: Fixed effect regression (1, 2, 5, 6), fixed effects two-stage least squares (3, 4, 7, 8), county-year level data. Standardized coefficients reported. Robust standard errors in parentheses. *** p<0.001, ** p<0.01, * p<0.05, 'p<.1