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Moral Regulation in Digital Life: Age-Verification Laws and the Redirection of Online Pornography Search

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Abstract

Introduction

: State age-verification laws for online pornography create a new form of digital moral regulation by making adult-content access conditional on identity verification, platform compliance, and access friction. This study develops the concept of regulatory redirection to describe how such regulation may reduce visible engagement with a targeted platform while shifting search attention toward alternative adult-content pathways or privacy tools.

Methods

Using Oklahoma's 2024 age-verification implementation-period access shock, we analyze monthly state-level Google Trends data for Oklahoma and 11 comparison states from January 2022 through October 2025. The analysis uses anchor-normalized search measures and compares pre- and post-implementation changes using difference-in-differences, event-study, robustness, and synthetic-control analyses. Each main focal-term model includes 552 state-month observations.

Results

Results show a sharp decline in Pornhub search interest after implementation, indicating reduced visible engagement with the targeted platform. However, adult-content search did not collapse more broadly. Search interest increased for selected alternative adult-content terms, especially XVideos and "free porn," and generic VPN search interest also rose.

Conclusions

The findings suggest that age-verification laws may reorganize visible search behavior instead of simply suppressing adult-content seeking. Digital moral regulation operates through platform infrastructure, identity-based access control, and shifting conditions of visibility.

Policy Implications

: Policymakers should evaluate age-verification laws not only by platform-specific reductions in search interest, but also by possible displacement toward alternative sites, privacy tools, and less visible access pathways.

Introduction

Pornography has long been a site of sociological struggle over sexuality, morality, family, childhood, religion, and the legitimate reach of state power. Debates over pornography are rarely only about sexual material itself. They are also debates over what kinds of sexual expression are publicly tolerable, what harms the state recognizes, and how moral judgments become translated into law and regulation (Johnson, 2010; Person et al., 2016; Wilkin, 2004). In the digital era, these struggles increasingly operate through platform infrastructure rather than direct prohibition alone. Online age-verification laws do not simply ban adult content or prosecute particular distributors. Instead, they regulate the pathway of access by making adult-content availability conditional on identity verification, platform compliance, geoblocking, and digital gatekeeping.

This shift creates a sociological puzzle. When states regulate morally contested digital behavior through access infrastructure, does visible behavior disappear, or does it move elsewhere? Lawmakers, parents, and child-protection advocates argue that minors can access explicit material too easily in digital environments where conventional age gates often amount to little more than self-attestation. Yet stronger age-verification systems require adult users to encounter identity checks, third-party verification services, geolocation, documentation requirements, or other forms of digital gatekeeping in a highly stigmatized

sexual domain (Marsden, 2023). This makes online age verification more than a technical compliance issue. It is a case of digital moral regulation in which state power, platform responsibility, privacy, anonymity, and institutional visibility intersect.

Pornography is a particularly important site for examining this process because it is simultaneously common, morally contested, and socially consequential. A large sociological literature links pornography to religion, moral incongruence, intimate relationships, marital quality, and public debates over family and sexual order (Perry, 2015, 2016, 2017a, 2017b, 2018a, 2018b; Perry & Schleifer, 2018; Perry & Whitehead, 2022). Pornography is also a recurring object of moral and political conflict, where debates over harm, disgust, obscenity, gender, childhood protection, and public morality become translated into legal and regulatory projects (Johnson, 2010; Lykke & Cohen, 2015; Person et al., 2016; Wilkin, 2004). Yet online age-verification laws differ from older obscenity regimes. They shift the regulatory focus from the content of pornography to the conditions under which users may access it. Adult-content access, once relatively anonymous and low-friction, becomes tied to proof of age, platform response, and the possibility of data exposure.

Existing scholarship provides important tools for understanding pornography regulation, but it leaves a key empirical gap. Legal scholarship has debated whether age-verification laws can protect minors without unduly burdening adults' rights, privacy, or access to lawful content (Anduze, 2025; Marsden, 2023). Research on online pornography governance has shown that states increasingly rely on platforms, intermediaries, and technical infrastructures to regulate sexual content (Curtis, 2008; Keen et al., 2020). Work on sexuality under regulation further suggests that people do not always respond to sexual restrictions through simple compliance; they may adapt, conceal, reroute, or seek less visible pathways (Goh et al., 2019). What remains less understood is what happens after an online age-verification regime becomes operational. Does visible search interest in a targeted adult platform decline? Does search attention shift toward other adult-content pathways? Does privacy or circumvention search increase? Or does digital moral regulation reorganize visible behavior in ways that are missed by a simple "access reduced/access not reduced" policy frame?

This article conceptualizes that process as regulatory redirection. Building on research on pornography regulation, platform-mediated governance, privacy concerns, and adaptive responses to sexual regulation, regulatory redirection refers to an aggregate behavioral pattern in which a legal or platform-mediated access intervention reduces visible engagement with a targeted platform while increasing search attention toward alternative adult-content pathways, generic adult-content terms, or privacy tools (Curtis, 2008; Goh et al., 2019; Johnson, 2010; Keen et al., 2020; Marsden, 2023). The concept differs from simple suppression because it does not assume that demand disappears after regulation. It also differs from direct political resistance because users need not be consciously opposing the law. Instead, regulatory redirection captures a more ordinary form of adaptation: when a digital access regime changes the costs, visibility, or availability of stigmatized behavior, visible search behavior may move elsewhere.

This study examines regulatory redirection using Oklahoma's 2024 age-verification implementation-period access shock as an empirical case. The case is useful not because Oklahoma is exceptional, but because it provides a clearly timed setting in which law implementation, platform response, and public attention converged. Using monthly state-level Google Trends data from 2022 through 2025, the analysis constructs anchor-normalized search measures and compares Oklahoma with control states. The results show a sharp and robust decline in search interest for Pornhub after implementation, but not a general collapse in adult-content search. Instead, search interest increased for selected alternative adult-content terms, including XVideos and "free porn," and generic VPN search interest also rose. These findings suggest that age-verification regimes may not simply suppress online pornography search. Rather, they may redirect visible search behavior across adult-content platforms, access pathways, and privacy tools. The study contributes to sociology by showing how contemporary moral regulation increasingly operates through platform infrastructure, identity-based access control, and shifting conditions of visibility.

Literature Review and Theoretical Framing

Pornography Regulation as Moral Regulation

Pornography regulation has long been a sociological problem because it brings together sexuality, morality, state power, religion, family, and social control. Debates over pornography are rarely limited to the availability of sexual material. They also concern which forms of sexual expression are publicly tolerable, what harms the state recognizes, and how moral judgment becomes translated into regulatory practice. Johnson's (2010) study of "extreme pornography" law in England and Wales shows how legal regulation can rely on moral language about offensiveness, disgust, and obscenity, situating pornography law within broader struggles over sexuality, harm, and social toleration. Similarly, Wilkin (2004) shows that pornography policy debates are shaped by rhetorical strategies that define pornography as a public problem requiring state intervention.

This literature is important because contemporary age-verification laws are not simply technical internet policies. They belong to a longer history of moral regulation, where states intervene in sexual life in the name of public protection, childhood innocence, decency, or harm prevention. Unlike older obscenity laws that centered on whether particular materials should be prohibited, age-verification laws regulate the conditions of access. They make access conditional on identity verification, platform compliance, and digital gatekeeping. This marks a shift from regulating the content of pornography to regulating the pathway through which users reach it.

Comparative policy research also supports this framing. Person et al. (2016) show that pornography regulation has not moved in a simple linear direction from repression to permissiveness. Instead, pornography policy has become more differentiated, with some domains becoming more permissive while others become subject to specialized intervention. Age-verification laws fit this pattern. They are not a return to blanket prohibition; they are a specialized intervention into online access, justified through child protection and implemented through digital infrastructure.

Pornography, Moral Politics, and Private Behavior

A second body of sociological research shows why pornography is a particularly important site for studying regulation and behavioral response. Pornography is morally charged and socially stigmatized, even as it remains widely accessible in private digital life. In the United States, religious conservatives have long opposed pornography as a threat to moral order, family life, sexual discipline, and youth socialization (Perry, 2015; Perry & Whitehead, 2022; Regnerus, 2007; Sherkat & Ellison, 1997). Perry and Whitehead (2022) further show that anti-pornography politics is not only about individual moral disapproval. Christian nationalism predicts support for anti-pornography legislation and beliefs that pornography threatens public morals, even when it does not necessarily predict individual pornography use. This distinction is important because pornography can become a public menace in political discourse even as private behavior persists.

A broader empirical literature also shows that pornography use is embedded in social relationships, religious life, and family institutions rather than existing as a purely private media practice. Studies link pornography use to adult social bonds, religious socialization, religiosity, and religious bonding over time (Perry, 2015, 2017a, 2017c; Stack et al., 2004). Other work examines how pornography use is associated with relationship quality, marital quality, and divorce, showing that pornography can become a point of tension in intimate and family life (Doran & Price, 2014; Maddox et al., 2011; Perry, 2016, 2017b; Perry & Schleifer, 2018; Poulsen et al., 2013). At the population level, scholarship has also documented changes in pornography-related attitudes and behaviors, as well as the methodological challenges of measuring pornography use in surveys (Price et al., 2016; Regnerus et al., 2016).

This literature helps explain why age-verification laws may produce distinctive behavioral responses. If pornography access is already stigmatized, identity-based regulation may raise the perceived exposure cost of access. Users may respond not only to blocked content, but also to the possibility that their access to stigmatized sexual material becomes more institutionally visible. The key sociological issue, then, is not simply whether the state reduces pornography use. It is how people respond when private sexual access becomes tied to digital identity, platform monitoring, and verification systems.

From Obscenity Law to Digital Governance

The internet complicates traditional state regulation of pornography because online sexual content is distributed through platforms, intermediaries, search engines, hosting services, and access providers. Regulation is no longer carried out only

through courts, police, or censorship boards. It increasingly depends on the cooperation, resistance, or withdrawal of private digital actors. Keen et al. (2020) describe this transformation as part of the changing nature of state regulation of online pornography. Their work shows how democratic states struggle to regulate corporate internet intermediaries directly while individuals become exposed to new punitive or access-control mechanisms.

Age-verification laws intensify this platform-mediated form of governance. The state creates a regulatory environment in which platforms must decide whether to comply with verification requirements, restrict access, alter service availability, or leave a jurisdiction. Users experience regulation through these platform decisions. In this sense, the state governs indirectly: law reshapes platform incentives, platform decisions reshape access, and users respond to the changed access environment.

Curtis's (2008) work on the domestication and regulation of online gambling and pornography is useful here. Curtis argues that online pornography is embedded in household internet use and that state regulation struggles to keep pace with technological change. This matters because online pornography is not simply marginal or deviant; it is part of ordinary digital practice. Regulating it may therefore produce adaptation rather than simple compliance or noncompliance. Users may alter search practices, move across platforms, use privacy tools, or seek alternative routes of access.

Age Verification, Identity, and Regulatory Redirection

Age-verification laws introduce a specific form of digital governance: identity-based access control. The user is no longer simply deciding whether to visit an adult site. The user is asked, directly or indirectly, to prove eligibility for access. This changes the meaning of online adult-content access. It becomes not only a private sexual practice, but also an interaction with verification infrastructure.

This shift raises broader sociological questions about privacy, surveillance, stigma, and institutional visibility. Adult users may object not only to being blocked from content, but also to being required to verify identity in a stigmatized domain. Age verification may therefore create exposure costs: perceived risks that private sexual access could become visible to platforms, verification companies, state systems, hackers, data brokers, or other institutional actors. Whether or not these risks are technically accurate in every case, they may still shape behavior because people respond to perceived visibility as well as actual visibility. Legal scholarship has focused heavily on whether recent age-verification laws can survive constitutional challenges (Anduze, 2025; Marsden, 2023). A sociological approach asks a different question: how do people respond when access to sexual content becomes tied to identity verification and platform access decisions?

We use the term regulatory redirection to describe this process. Regulatory redirection refers to an aggregate behavioral pattern in which a legal or platform-mediated access intervention reduces visible engagement with a targeted platform or activity while increasing search attention toward alternative pathways that preserve access, anonymity, or reduced institutional visibility. The concept differs from simple suppression because it does not assume that demand disappears. It differs from substitution because the response may involve not only another platform, but also a changed access strategy. It differs from direct resistance because users need not be politically motivated or consciously oppositional.

In the case of online age-verification laws, regulatory redirection may occur through two related mechanisms. First, platform access disruption may reduce search interest in a targeted platform if that platform becomes blocked, restricted, or harder to access. Second, identity-based access control may increase perceived exposure costs if users associate verification with privacy risks, stigma, institutional visibility, or loss of anonymity. Search interest in a targeted platform may decline, while search interest in selected alternative adult-content terms or generic privacy tools may increase. The central sociological point is that the pathway of behavior may change even when the underlying demand does not disappear.

Goh et al.'s (2019) study of gay men and pornography in Malaysia helps complicate the idea that pornography is merely an object of pleasure or harm. They show that, under conditions of censorship and sexual regulation, pornography can become connected to dissent, self-awareness, and discreet protest against the regulation of sexual life. The U.S. state-law context differs from Malaysia's media and sexual politics, but the broader sociological insight is useful: when sexuality is regulated, people may adapt, conceal, reroute, or search for alternative pathways.

This study builds on these insights by examining whether such adaptation can be observed in aggregate search behavior after a state-level digital access regime becomes operational. Oklahoma's 2024 implementation-period access shock provides a clearly timed case in which law implementation, platform response, and public attention converged. Using monthly state-level Google Trends data, the analysis examines whether the implementation of a state age-verification access regime was associated with changes in visible search behavior across three domains: targeted platform search, selected alternative adult-content search, and generic privacy/circumvention search. Figure 1 summarizes the conceptual framework linking state age-verification laws to an implementation-period access regime, two mechanisms of platform access disruption and identity-based access control, and the observable outcome of regulatory redirection.

[Figure 1 here]

Materials and Methods

Research Design

This study examines how visible online search behavior changes when a state age-verification regime becomes operational. The empirical case is Oklahoma's 2024 age-verification implementation-period access shock. Oklahoma Senate Bill 1959 took effect on November 1, 2024, and required commercial entities distributing material deemed harmful to minors to use age verification (Oklahoma Legislature 2024; Boden, 2024). The implementation period was also marked by public reporting of adult-site access restrictions for Oklahoma users, making the empirical treatment a combined law-and-platform access shock rather than the isolated effect of legal text alone (The Journal Record, 2024). The law allowed enforcement through private lawsuits and action by the state attorney general, and it permitted verification through digitized identification, third-party verification services, or other commercially reasonable methods.

The treatment in this study is best understood as an implementation-period access shock, not the isolated legal effect of the statute alone. This distinction is important. Users do not experience a law only as legal text; they experience a changed access environment produced by law implementation, platform response, access restrictions, enforcement uncertainty, and public attention. The analysis therefore examines whether this implementation-period access regime was associated with changes in visible search behavior.

The empirical design compares Oklahoma before and after November 2024 to a set of control states that did not have comparable adult-content age-verification laws during the same treatment window. The analysis is exploratory rather than hypothesis-testing. The goal is not to determine whether the law "worked" in a narrow policy sense, nor to measure pornography consumption directly. Instead, the study examines whether the implementation shock was associated with changes in three forms of search behavior: targeted platform search, alternative adult-content search, and privacy/circumvention search.

The analysis uses a difference-in-differences framework. Oklahoma is the treated state. The post-treatment period begins in November 2024, the month the age-verification regime became operational. The comparison group consists of control states observed over the same period. Because some states adopted similar laws later, the analytic period is restricted to January 2022 through October 2025 to avoid contamination from later treatment events. The final analytic dataset is a state-month-term-anchor panel, with monthly observations for Oklahoma and comparison states. Table 1 summarizes the structure of the anchor-normalized Google Trends panel, including the treated state, comparison states, study period, outcome families, anchor terms, and scope of inference.

Table 1
Data Structure and Anchor-Normalized Search Panel.

Panel feature	Description
Empirical case	Oklahoma's 2024 age-verification implementation-period access shock
Treated state	Oklahoma
Comparison states	Colorado, Illinois, Iowa, Michigan, Minnesota, Missouri, New Mexico, Oregon, Pennsylvania, Washington, Wisconsin
Study period	January 2022–October 2025
Unit of observation	State-month-target term-anchor term
Data source	Google Trends
Main outcome	Anchor-normalized log search ratio
Primary anchor	Weather
Robustness anchors	YouTube, Facebook, News
Number of states	12
Number of target search terms	23
Number of anchor terms	4
Outcome families	Targeted platform search; alternative adult-content search; privacy/circumvention search; age-verification/privacy search; placebo search
Targeted platform term	Pornhub
Alternative adult-content terms	XVideos, XNXX, RedTube, porn, free porn, adult sites
Privacy/circumvention terms	VPN, free VPN, Pornhub VPN, VPN porn, Pornhub blocked, how to access Pornhub
Age-verification/privacy terms	age verification, ID verification, age verification privacy, online age verification, porn age verification
Placebo terms	Netflix, Amazon, antivirus, speed test, password manager
Treatment timing	Post period begins November 2024
Main comparison	Oklahoma before vs. after implementation, relative to control states over the same period
Main estimand	Change in visible search behavior associated with the implementation-period access shock
Main analyses	Difference-in-differences; event study; alternative-anchor robustness; state-specific trends; short-window models; placebo-date test; leave-one-control-state-out checks; synthetic control
Scope of inference	Relative search attention, not raw search counts, website traffic, pornography consumption, or individual VPN adoption

Note: The analytic panel uses anchor-normalized Google Trends measures. Each focal search term is collected with a high-volume anchor term in the same query, and the main outcome is calculated as the log ratio of focal-term search interest to anchor-term search interest. The treatment is interpreted as an implementation-period access shock because users experienced the law through a combination of legal implementation, platform response, access disruption, and public attention.

[Table 1 here]

Data Source: Google Trends

The main data source is monthly state-level Google Trends search interest[1]. Google Trends is appropriate for this study because it captures rapid changes in public search behavior around digital policy shocks. This is especially useful for studying online regulation, where behavioral responses may occur quickly and may not be captured by survey or administrative data.

However, Google Trends data require careful interpretation. Google Trends does not report raw search counts. It reports normalized search interest. Values are scaled relative to search volume within a selected time, geography, and query context. This creates an important measurement concern for state-level comparisons: if search terms are collected separately for each state, the resulting 0–100 scales may not be directly comparable across states. To address this issue, we construct anchor-normalized search measures. Each focal search term is collected together with a high-volume, policy-irrelevant anchor term in the same Google Trends query. The main anchor is weather, with YouTube, Facebook, and news used as robustness anchors. The dependent variable is the log ratio of focal search interest to anchor search interest within the same state-month:

$$Y_{smt} = \log(TargetSearch_{smt} + 0.5) - \log(AnchorSearch_{smt} + 0.5)$$

Where Y_{smt} is the anchor-normalized search outcome for state s, month m, and focal term t; $TargetSearch_{smt}$is Google Trends search interest for a focal term in state s, month m, and query t, and $AnchorSearch_{smt}$is search interest for the anchor term collected in the same query. The small constant reduces instability when Google Trends reports zero values. This anchor-normalized measure does not eliminate all limitations of Google Trends data, but it improves comparability by expressing each focal term relative to a broad baseline search term within the same state-month.

The outcome should therefore be interpreted as relative search attention, not raw search volume. The study does not claim to measure the number of searches, website visits, pornography consumption, or individual VPN adoption. It examines whether visible search behavior shifted after implementation of a state age-verification access regime.

Outcome Measures

The analysis uses an expanded set of search terms organized into four outcome families.

First, targeted platform search is measured with Pornhub. This is the central adult-platform outcome because Pornhub was the most visibly affected platform in the implementation period. A decline in this term is interpreted as reduced visible search interest in the targeted platform, not as a decline in pornography consumption.

Second, alternative adult-content search is measured using terms such as XVideos, XNXX, RedTube, porn, free porn, and adult sites. These outcomes allow the analysis to test whether search behavior shifted toward other adult-content pathways rather than simply declining. This distinction is important for the theory of regulatory redirection: if Pornhub search declines while alternative adult-content terms increase, the pattern is more consistent with redirection than simple suppression.

Third, privacy and circumvention search is measured using terms such as VPN, free VPN, Pornhub VPN, VPN porn, Pornhub blocked, and how to access Pornhub. Based on the new data, the most reliable term in this family is generic VPN. Several porn-specific circumvention terms are low-volume and are therefore treated as exploratory rather than central outcomes. An increase in generic VPN search is interpreted cautiously as increased attention to privacy or circumvention tools, not as direct evidence that users adopted VPNs.

Fourth, the analysis includes age-verification/privacy terms and placebo terms. Age-verification/privacy terms include age verification, ID verification, age verification privacy, online age verification, and porn age verification. These terms are useful for exploring public attention to identity verification, but several are too sparse in state-month Google Trends data to support strong main-text claims. Placebo terms include Netflix, Amazon, antivirus, speed test, and password manager. These terms help assess whether the observed shifts are specific to adult-content and privacy/circumvention search or instead reflect broader changes in general search behavior. Table 2 reports descriptive pre- and post-implementation means for selected targeted platform, alternative adult-content, privacy/circumvention, and placebo search terms using the primary weather anchor.

Table 2
Pre- and Post-Implementation Mean Anchor-Normalized Search Interest for Selected Terms

Outcome family	Search term	Oklahoma pre	Oklahoma post	Oklahoma change	Control pre	Control post	Control change	Descriptive DiD
Targeted platform search	Pornhub	-1.517	-2.777	-1.260	-1.675	-1.614	0.061	-1.322
Alternative adult-content search	XVideos	-2.560	-2.254	0.306	-2.806	-2.781	0.025	0.281
Alternative adult-content search	Free porn	-2.841	-2.371	0.470	-2.997	-2.859	0.138	0.332
Alternative adult-content search	Porn	-0.733	-0.526	0.206	-0.967	-0.740	0.226	-0.020
Alternative adult-content search	RedTube	-4.388	-4.474	-0.086	-4.177	-4.314	-0.136	0.051
Alternative adult-content search	XNXX	-2.130	-2.040	0.089	-2.456	-2.428	0.028	0.061
Privacy/circumvention search	VPN	-4.359	-3.420	0.940	-4.067	-3.696	0.370	0.569
Placebo search	Netflix	-1.934	-1.922	0.012	-1.973	-1.868	0.105	-0.093
Placebo search	Amazon	-0.602	-0.716	-0.114	-0.552	-0.580	-0.028	-0.086
Placebo search	Speed test	-2.986	-3.051	-0.065	-3.071	-3.137	-0.066	0.001

Note: Values are means of the anchor-normalized log search ratio using the primary weather anchor. The pre-implementation period is January 2022 through October 2024, and the post-implementation period is November 2024 through October 2025. Oklahoma is the treated state. Control states include Colorado, Illinois, Iowa, Michigan, Minnesota, Missouri, New Mexico, Oregon, Pennsylvania, Washington, and Wisconsin. The descriptive DiD equals Oklahoma change minus control-state change. Values are descriptive and should not be interpreted as causal estimates.

[Table 2 here]

Treatment and Control Groups

The treatment state is Oklahoma. The post-treatment period begins in November 2024. The treatment variable is the interaction between an Oklahoma indicator and a post-implementation indicator. The coefficient on this interaction estimates whether Oklahoma's anchor-normalized search interest changed after the implementation shock relative to contemporaneous changes in control states.

The control states are selected because they provide comparison cases without comparable adult-content age-verification laws during the analytic window. The expanded dataset includes Oklahoma and eleven comparison states. The purpose of adding more control states is to reduce reliance on a small comparison group and strengthen the credibility of the counterfactual trend. The analysis also includes leave-one-control-state-out robustness checks to assess whether results depend on any single comparison state.

Because the study uses one treated state, the estimates are interpreted as a quasi-experimental case study rather than a universal causal estimate for all age-verification laws. The empirical goal is to examine whether a clearly timed implementation-period access shock generated search patterns consistent with regulatory redirection.

Model Specification

The main specification is a two-way fixed effects difference-in-differences model estimated separately by search term and anchor:

$$Y_{smt} = \beta_0 + \beta_1(Oklahoma_s \times Post_m) + \gamma_s + \delta_m + \epsilon_{smt}$$

where $Y_{smt}$is the anchor-normalized log search ratio for state s, month m, and focal term t. $Oklahoma_s$identifies the treated state, and $Post_m$identifies months beginning in November 2024. State fixed effects, γ_s, account for stable differences across states. Month fixed effects, δ_m, account for national shocks and seasonality common to all states. The coefficient of interest is β_1, which captures the implementation-period change in Oklahoma relative to the control states.

The models are estimated separately for each term because each outcome has a different theoretical meaning. A decline in Pornhub search, an increase in XVideos search, and an increase in VPN search all speak to different parts of the regulatory redirection framework. Pooling them would obscure these distinctions.

The main analyses use weather as the primary anchor. Additional models using YouTube, Facebook, and news as anchors are used to assess whether results are robust to alternative normalization baselines. The analysis also reports HC3 robust standard errors and state-clustered standard errors. Because the number of state clusters is limited, inference is interpreted cautiously, and the emphasis is placed on effect size, direction, consistency across anchors, event-study timing, state-specific trend models, placebo outcomes, and synthetic-control estimates.

Robustness and Supplementary Analyses

The study includes several robustness checks designed to address concerns about causal interpretation and Google Trends measurement.

First, we estimate models with state-specific linear trends. These models test whether the main estimates are robust to differential preexisting trends across states. Second, we estimate short-window models using the period closest to implementation. This reduces the possibility that older pre-treatment differences drive the results. Third, we conduct a placebo implementation-date test using a fake November 2023 treatment date within the pre-treatment period. Fourth, we estimate leave-one-control-state-out models to check whether results depend on a single control state. Fifth, we examine placebo search terms to assess whether the observed effects are specific to adult-content and privacy/circumvention terms. Finally, because the treatment is concentrated in one state, we supplement the DiD models with a synthetic control analysis that compares Oklahoma to a weighted combination of control states selected to match pre-implementation search patterns.

Scope of Inference

The scope of inference is intentionally limited. The study does not estimate pornography consumption, minors' access to adult content, website traffic, or actual VPN adoption. It also does not isolate the legal text from platform response and public attention. Instead, it estimates changes in visible search behavior around an implementation-period access shock. This framing is appropriate because state age-verification laws operate through a broader access regime: legal requirements, platform compliance or withdrawal, access friction, and user interpretation of exposure costs.

The key empirical question is whether that access regime redirected visible search behavior. Evidence of a decline in Pornhub search, combined with increases in selected alternative adult-content terms and generic VPN search, would support the argument that digital moral regulation can redirect search behavior rather than simply suppress it.

Results

Descriptive Patterns

The descriptive patterns show that the implementation-period access shock was followed by a sharp change in Oklahoma's visible search behavior, but not a broad decline in all adult-content search. The clearest descriptive shift is for Pornhub. After implementation, Oklahoma's anchor-normalized search interest for Pornhub fell substantially relative to the control states. This pattern is consistent with platform-specific disruption: search attention moved away from the targeted platform most visibly affected by the access regime.

The descriptive results also suggest that this decline did not represent a general collapse in adult-content search. Several alternative adult-content terms show different patterns. Search interest for XVideos and free porn increased after implementation, suggesting that some visible search behavior shifted toward alternative adult-content pathways. Other adult-content terms, such as porn, RedTube, and XNXX, show weaker or less consistent changes. This mixed pattern is important because it suggests that the implementation shock disrupted search interest in a particular platform rather than suppressing adult-content search behavior broadly.

The privacy/circumvention family also shows a selective pattern. The strongest and most reliable increase is for the generic term VPN. By contrast, several more specific terms, such as Pornhub VPN, VPN porn, Pornhub blocked, free VPN, and how to access Pornhub, were too sparse in the state-month Google Trends data to support strong conclusions. Similarly, age-verification/privacy terms such as age verification, age verification privacy, and porn age verification had limited usable variation in the primary anchor specification. For this reason, the main interpretation focuses on three observed patterns: a decline in Pornhub search, an increase in selected alternative adult-content searches, and an increase in generic VPN search.

Difference-in-Differences Estimates

Table 3 presents the main difference-in-differences estimates using the anchor-normalized log-ratio outcome. The primary models use weather as the anchor term. The coefficient estimates whether Oklahoma's search interest changed after the implementation-period access shock relative to contemporaneous changes in the control states.

Table 3
Difference-in-Differences Estimates of the Implementation-Period Access Shock on Anchor-Normalized Search Interest

Outcome family	Search term	DiD estimate	Cluster SE	Cluster p	HC3 SE	HC3 p	Approx. % change
Adult-content/platform search	Pornhub	-1.322	0.020	< .001	0.079	< .001	-73.3
Adult-content/platform search	XVideos	0.281	0.028	< .001	0.087	.001	32.5
Adult-content/platform search	Free porn	0.332	0.010	< .001	0.100	< .001	39.3
Adult-content/platform search	Porn	-0.020	0.015	.183	0.061	.740	-2.0
Adult-content/platform search	RedTube	0.051	0.083	.542	0.076	.507	5.2
Adult-content/platform search	XNXX	0.061	0.023	.007	0.069	.376	6.3
Privacy/circumvention search	VPN	0.569	0.048	< .001	0.076	< .001	76.7
Placebo search	Netflix	-0.093	0.010	< .001	0.060	.122	-8.9
Placebo search	Amazon	-0.086	0.015	< .001	0.062	.165	-8.2
Placebo search	Speed test	0.001	0.037	.986	0.061	.991	0.1

Note The dependent variable is the anchor-normalized log search ratio using the primary weather anchor. Each estimate comes from a separate two-way fixed effects difference-in-differences model with state and month fixed effects. The post period begins in November 2024. Oklahoma is the treated state. Control states include Colorado, Illinois, Iowa, Michigan, Minnesota, Missouri, New Mexico, Oregon, Pennsylvania, Washington, and Wisconsin. Approximate percent change is calculated as $100 \times [exp(\beta) - 1]$. Each model includes 552 state-month observations across 12 states. Cluster SEs are clustered by state; HC3 SEs are reported as an additional robustness check.
[Table 3 here]

The strongest result is for Pornhub. The weather-anchor estimate is -1.322, indicating a large decline in Pornhub search interest relative to the anchor and control states. Because the dependent variable is a log ratio, this estimate corresponds roughly to a 73 percent decline in anchor-normalized Pornhub search interest. The estimate is highly consistent across alternative anchors: the coefficient is -1.294 with the Facebook anchor, -1.370 with the YouTube anchor, and − 1.289 with the news anchor. This is the most robust finding in the study.

The adult-content results show that the Pornhub decline was not a general decline in all adult-content search. Using the weather anchor, XVideos increased by 0.281, equivalent to roughly a 32 percent increase in anchor-normalized search interest. Free porn increased by 0.332, roughly a 39 percent increase. These results are also positive across alternative anchors. By contrast, porn shows no meaningful change in the weather-anchor model, and RedTube is not statistically or substantively robust in the primary specification. XNXX is positive in the clustered specification but weaker under HC3 inference. Taken together, the adult-content results suggest targeted disruption and partial redirection rather than broad suppression.

The circumvention results show a clear increase in generic VPN search interest. The weather-anchor coefficient for VPN is 0.569, corresponding to roughly a 77 percent increase in anchor-normalized search interest. This result is positive across other anchors, although smaller in magnitude with Facebook, YouTube, and news. The increase also survives the state-specific trend and short-window robustness checks. However, the more porn-specific circumvention terms are too sparse to serve as main evidence. Therefore, the evidence supports an increase in generic VPN search attention, but not a strong claim that users specifically searched for porn-related VPN workarounds.

The placebo terms provide a useful caution. In the weather-anchor model, Amazon and Netflix show small negative estimates, while speed test is essentially zero. These placebo movements are much smaller than the Pornhub decline and do not match the adult-platform/circumvention pattern. Still, they reinforce the need to interpret the findings as changes in visible search behavior rather than direct evidence of individual-level user decisions. Figure 2 visualizes the main difference-in-differences estimates, highlighting the large negative Pornhub estimate, positive estimates for selected alternative adult-content terms and VPN, and comparatively small placebo-term shifts.

[Figure 2 here]

Overall, the DiD estimates support the regulatory redirection argument. The implementation shock was associated with a large decline in search interest for the targeted platform, an increase in selected alternative adult-content searches, and an increase in generic VPN search interest. The pattern is not consistent with simple suppression of adult-content search. It is more consistent with visible search behavior shifting away from a disrupted platform and toward alternative access pathways and privacy/circumvention tools.

Dynamic Event-Study Evidence

The event-study models examine the timing of these changes relative to the November 2024 implementation period. These models estimate Oklahoma-specific deviations in each month relative to October 2024, the month immediately before implementation. The event-study figures are important because they show whether the observed changes occur around the access shock or reflect a longer-running trend.

The event-study evidence is strongest for Pornhub. Search interest declines sharply immediately after the implementation period and remains substantially below the pre-implementation reference period. The timing is consistent with a platform-specific access disruption. The decline is not a gradual drift spread evenly across the pre-period; it is concentrated around the implementation shock and persists afterward. Figure 3 presents the event-study estimates for Pornhub, showing whether Oklahoma's decline in targeted platform search occurred around the November 2024 implementation period rather than gradually during the pre-period.

[Figure 3 here]

The event-study evidence for alternative adult-content terms is more mixed but consistent with partial redirection. XVideos and free porn show post-implementation increases in the main DiD models, and their dynamic patterns suggest that some search attention moved toward alternative adult-content pathways. These results should be interpreted as evidence of selected redirection rather than a uniform shift across all adult-content terms. Figure 4 presents event-study estimates for selected alternative adult-content terms, allowing visual assessment of whether search attention shifted toward alternative adult-content pathways after implementation.

[Figure 4 here]

The event-study for VPN also supports the interpretation that privacy or circumvention-related attention increased after implementation. The dynamic pattern is less dramatic than the Pornhub decline, but the post-implementation coefficients move upward and the average post-period effect is positive. This is consistent with the idea that the access shock increased search attention to generic privacy/circumvention tools. Figure 5 presents the event-study estimates for VPN, showing the timing of changes in generic privacy/circumvention search relative to the implementation-period access shock.

[Figure 5 here]

The low-volume age-verification/privacy and porn-specific circumvention terms should not be central to the Results section. Their sparse search volume makes the dynamic estimates difficult to interpret. These terms are better treated as exploratory appendix outcomes rather than as evidence for the main argument.

Robustness Checks

The robustness checks support the main conclusion that the implementation-period access shock produced a platform-specific decline in Pornhub search and a selective increase in alternative adult-content and VPN search.

First, the main Pornhub result is robust across alternative anchors. The coefficient remains large and negative using weather, Facebook, YouTube, and news as anchors. This directly addresses the concern that the finding is an artifact of a single Google Trends normalization baseline.

Second, the results are robust to state-specific linear trends. In the weather-anchor model with state-specific trends, the Pornhub coefficient remains strongly negative at -1.305. The VPN coefficient remains positive at 0.364. This suggests that the main pattern is not simply driven by preexisting differential state trends.

Third, the short-window models produce similar results. Restricting the analysis to the period closest to implementation, the Pornhub coefficient remains large and negative at -1.288, and the VPN coefficient remains positive at 0.490. The short-window results strengthen the interpretation that the main changes are concentrated around the implementation period rather than driven by older pre-treatment differences.

Fourth, the placebo-date test using November 2023 as a fake implementation date produces much smaller estimates than the actual implementation-period estimates. For Pornhub, the placebo-date coefficient is -0.053, compared to the actual weather-anchor estimate of -1.322. For VPN, the placebo-date coefficient is 0.122, compared to the actual estimate of 0.569. This reduces concern that the main results are simply capturing an Oklahoma-specific shift that began one year earlier.

Fifth, the synthetic control results support the main DiD findings. For Pornhub, the post-implementation gap between actual Oklahoma and synthetic Oklahoma is -1.203, and the post/pre RMSPE ratio is 8.35, indicating a large break from the pre-implementation fit. For VPN, the synthetic-control post-gap is 0.703, with a post/pre RMSPE ratio of 2.76. For XVideos and free porn, the synthetic-control gaps are also positive. These results provide additional evidence that the implementation shock was associated with a sharp decline in targeted platform search and increases in selected alternative and privacy-related searches. Figure 6 reports the synthetic-control evidence for Pornhub search interest, comparing actual Oklahoma with a weighted synthetic Oklahoma constructed from control states.

[Figure 6 here]

Discussion

This study examined how visible search behavior changed after Oklahoma's age-verification regime for online adult content became operational. The findings show a clear platform-specific disruption. Search interest in Pornhub declined sharply after the November 2024 implementation-period access shock, and this decline remained consistent across alternative anchors, short-window models, state-specific trend specifications, and synthetic-control analyses. At the same time, adult-content search did not collapse more broadly. Search interest increased for selected alternative adult-content terms, especially XVideos and "free porn," and generic VPN search interest also rose. Taken together, these patterns support the concept of regulatory redirection: digital regulation may reduce visible engagement with a targeted platform while shifting search attention toward alternative access pathways and privacy-oriented tools.

This finding contributes to the sociology of pornography regulation by moving the focus from legal classification and moral debate to observable behavioral response under platform-mediated governance. Prior research shows that pornography regulation is shaped by morality, harm claims, disgust, public standards, religion, family politics, and state power (Johnson, 2010; Person et al., 2016; Perry & Whitehead, 2022; Wilkin, 2004). The present study extends that work by showing how these moral conflicts are implemented through digital infrastructure. Age-verification laws do more than define certain sexual content as a public problem. They change the conditions of access by introducing platform compliance decisions, geoblocking, identity-verification requirements, and new forms of access friction. These mechanisms can alter where search attention appears, even when adult-content interest remains visible through other pathways.

The strongest empirical finding is the decline in Pornhub search interest. Substantively, this suggests that the implementation-period access shock disrupted visible engagement with a major targeted platform. However, the increase in selected alternative adult-content terms complicates any straightforward interpretation of policy suppression. When search interest falls for one platform but rises for other adult-content terms, the relevant sociological process is better understood as rerouting. The state-platform access regime appears to have shifted visible search behavior away from the disrupted platform and toward alternative adult-content pathways.

The increase in generic VPN search adds a second layer to this interpretation. This result does not show that users adopted VPNs, nor does it prove that the same individuals who stopped searching for Pornhub began searching for VPNs. The data are aggregate search measures, not individual behavioral traces. Still, the VPN increase is theoretically meaningful because age-verification regimes tie access to stigmatized sexual content more closely to identity, verification, and institutional visibility. In a domain shaped by shame, moral incongruence, and public-private tension (Perry, 2018a, 2018b), users may respond to both blocked access and perceived exposure costs. The rise in VPN search therefore suggests heightened attention to privacy or circumvention tools during the implementation period.

These findings refine the concept of regulatory redirection. Regulatory redirection does not imply that regulation fails, nor does it require users to consciously resist the state. It describes an aggregate pattern in which visible search behavior shifts away from a targeted platform and toward alternative access pathways, generic adult-content searches, or privacy tools. This concept is useful because contemporary sexuality regulation increasingly operates through platforms, intermediaries, and technical infrastructures rather than direct interpersonal enforcement. Law changes the access regime; platforms respond through compliance, restriction, or withdrawal; users encounter a changed digital environment; and aggregate search behavior may adjust accordingly.

The study also contributes to research on platform-mediated state power. Age-verification laws are not enforced only by state officials. They are translated through private platforms, third-party verification systems, technical access controls, and search infrastructures. This supports the argument that online pornography regulation reveals a changing relationship between democratic states and internet intermediaries (Keen et al., 2020). The present study adds that users are not passive objects of

this arrangement. Their search behavior may respond to platform decisions and access friction in ways that become visible at the aggregate level.

Limitations and Future Research

Several limitations should guide interpretation. First, Google Trends measures relative search interest, not raw search counts, website visits, pornography consumption, or individual VPN adoption. The results therefore capture visible search attention rather than private behavior itself. Second, the analysis focuses on one clearly timed implementation case. The findings should not be generalized to all age-verification laws without additional multi-state evidence. Third, the treatment combines law implementation, platform response, access disruption, enforcement uncertainty, and public attention. For this reason, the study interprets the treatment as an implementation-period access shock rather than the isolated effect of statutory text. Fourth, some age-verification and porn-specific circumvention terms were too sparse in state-month Google Trends data to support strong conclusions. The strongest defensible claim is therefore narrower: Oklahoma's implementation-period access shock was associated with a large decline in Pornhub search, increases in selected alternative adult-content searches, and an increase in generic VPN search.

Future research should examine additional state implementation events using staggered difference-in-differences or comparative synthetic-control designs. Researchers should also distinguish law passage, effective dates, enforcement activity, platform blocking, and public controversy more precisely. Combining Google Trends with website traffic data, survey data, interviews, or social media discussions would make it possible to distinguish more directly among suppression, substitution, privacy concern, and circumvention. Future studies could also examine whether regulatory redirection varies by state political culture, religious context, baseline pornography attitudes, or privacy norms.

Policy Implications

These findings suggest that age-verification laws for online adult content should be evaluated beyond platform-specific reductions in search interest. A sharp decline in searches for a restricted platform may indicate disruption, but it should not be treated as evidence that adult-content seeking has broadly declined. Policymakers should also consider whether regulation redirects users toward alternative adult-content sites, generic adult-content searches, VPN tools, or less visible access pathways.

The results also highlight the importance of privacy and implementation design. Because age verification operates through identity-based access control in a stigmatized domain, users may respond to perceived risks of exposure, surveillance, data misuse, or loss of anonymity. Policies that require age verification should therefore include clear privacy protections, limits on data retention, transparency about third-party verification systems, and safeguards against unintended data exposure. More broadly, regulators should assess whether these laws produce displacement into less accountable or less visible online spaces. Effective policy should pursue child-protection goals while accounting for platform substitution, privacy concerns, and the broader behavioral consequences of digital moral regulation.

Conclusion

This study shows that digital moral regulation can reorganize visible behavior. Oklahoma's age-verification implementation-period access shock sharply reduced search interest in Pornhub, but it did not produce a general collapse in adult-content search. Instead, search attention increased for selected alternative adult-content terms and generic VPN search. These findings suggest that when states regulate morally contested digital behavior through identity verification and platform infrastructure, visible behavior may shift rather than disappear. Regulatory redirection offers a useful framework for understanding how sexuality-related social policy operates in platform environments where access, anonymity, and visibility are increasingly intertwined.

Declarations

Funding:

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Competing interests: The authors have no relevant financial or non-financial interests to disclose.

Ethics approval: This study uses publicly available, aggregate Google Trends search-interest data. The analysis does not involve interaction with human participants, identifiable private information, biological material, or individual-level behavioral records. Institutional ethics review was therefore not required.

Consent to participate: Not applicable.

Consent to publish: Not applicable.

Availability of data and material: The data used in this study were derived from Google Trends. Public Google Trends data can be accessed through Google Trends. The processed analytic data are available from the corresponding author upon reasonable request.

Code availability: The code used to collect, process, and analyze the data is available from the corresponding author upon reasonable request.

Use of generative AI tools: During manuscript preparation, the authors used generative AI tools (Grammarly.com) for editorial assistance, language refinement, and organization. The authors reviewed, revised, and verified all text, citations, analyses, interpretations, and conclusions, and take full responsibility for the final manuscript.

Author Contribution

S.R. and M. JR. contributed to the study conception and design. S.R. and M.JR. contributed to the literature review and theoretical framing. M.JR. performed data collection, data preparation, and statistical analysis. S.R. and M.JR. interpreted the results. S.R. drafted the main manuscript text, and M.JR. revised the manuscript for methodological accuracy, theoretical framing, and intellectual content. M.JR. prepared the tables and figures. Both authors reviewed and approved the final manuscript.

Data Availability

The data used in this study were derived from Google Trends. Public Google Trends data can be accessed through Google Trends. The processed analytic data are available from the corresponding author upon reasonable request.

References

1. Anduze, D. S. (2025). Obscenity revisited: Defending recent age-verification laws against First Amendment challenges. *Columbia Journal of Law and Social Problems*, *58*(1), 147–192.
2. Boden, A. (2024, October 28). Oklahoma age-verification law takes effect November 1. Free Speech Coalition. Retrieved May 6, 2026, from https://www.freespeechcoalition.com/blog/oklahoma-age-verification-law-takes-effect-november-1
3. Curtis, B. (2008). Domestication and regulation of online gambling and pornography. *Kōtuitui: New Zealand Journal of Social Sciences Online*, *3*(2), 85–96.

4. Doran, K., & Price, J. (2014). Pornography and marriage. *Journal of Family and Economic Issues*, *35*(4), 489–498.
5. Goh, J. N., Lewis, G. L., & Leong, P. P. Y. (2019). Sexy media dissidents: State regulation, dissidence, pornography and gay men in Malaysia. *Sexuality & Culture*, *23*(1), 192–208.
6. Johnson, P. (2010). Law, morality and disgust: The regulation of extreme pornography in England and Wales. *Social & Legal Studies*, *19*(2), 147–163.
7. Keen, C., Kramer, R., & France, A. (2020). The pornographic state: The changing nature of state regulation in addressing illegal and harmful online content. *Media Culture & Society*, *42*(7–8), 1175–1192.
8. Lykke, L. C., & Cohen, P. N. (2015). The widening gender gap in opposition to pornography, 1975–2012. *Social Currents*, *2*(4), 307–323.
9. Maddox, A. M., Rhoades, G. K., & Markman, H. J. (2011). Viewing sexually explicit materials alone or together: Associations with relationship quality. *Archives of Sexual Behavior*, *40*(2), 441–448.
10. Marsden, C. (2023). Age-verification laws in the era of digital privacy. *National Security Law Journal*, *10*(2), 210–244.
11. Oklahoma Legislature (2024). SB 1959: Consumer protection; Prohibiting commercial entities from distributing adult material without age verification. Oklahoma State Legislature. Retrieved May 6, 2026, from https://www.oklegislature.gov/BillInfo.aspx?Bill=SB1959&Session=2400
12. Patterson, R., & Price, J. (2012). Pornography, religion, and the happiness gap: Does pornography impact the actively religious differently? *Journal for the Scientific Study of Religion*, *51*(1), 79–89.
13. Perry, S. L. (2015). Pornography consumption as a threat to religious socialization. *Sociology of Religion*, *76*(4), 436–458.
14. Perry, S. L. (2016). For better or for worse? Pornography consumption, spousal religiosity, gender, and marital quality. *Sociological Forum*, *31*(2), 441–464.
15. Perry, S. L. (2017a). Does viewing pornography diminish religiosity over time? Evidence from two-wave panel data. *Journal of Sex Research*, *54*(2), 214–226.
16. Perry, S. L. (2017b). Does viewing pornography reduce marital quality over time? Evidence from longitudinal data. *Archives of Sexual Behavior*, *46*(2), 549–559.
17. Perry, S. L. (2017c). Pornography use and religious bonding among heterosexually married Americans: A longitudinal examination. *Review of Religious Research*, *59*(1), 81–98.
18. Perry, S. L. (2018a). Not practicing what you preach: Religion and incongruence between pornography beliefs and usage. *Journal of Sex Research*, *55*(3), 369–380.
19. Perry, S. L. (2018b). Pornography use and depressive symptoms: Examining the role of moral incongruence. *Society and Mental Health*, *8*(3), 195–213.
20. Perry, S. L., & Schleifer, C. (2018). Till porn do us part? A longitudinal examination of pornography use and divorce. *Journal of Sex Research*, *55*(3), 284–296.
21. Perry, S. L., & Whitehead, A. L. (2022). Porn as a threat to the mythic social order: Christian nationalism, anti-pornography legislation, and fear of pornography as a public menace. *The Sociological Quarterly*, *63*(2), 316–336.
22. Person, C., Hurka, S., & Knill, C. (2016). Opposite trends in the regulation of pornography? Policy differentiation and policy convergence across 26 countries between 1960 and 2010. *Journal of Sex Research*, *53*(7), 860–872.
23. Poulsen, F. O., Busby, D. M., & Galovan, A. M. (2013). Pornography use: Who uses it and how it is associated with couple outcomes. *Journal of Sex Research*, *50*(1), 72–83.
24. Price, J., Patterson, R., Regnerus, M., & Walley, J. (2016). How much more XXX is generation X consuming? Evidence of changing attitudes and behaviors related to pornography since 1973. *Journal of Sex Research*, *53*(1), 12–20.
25. Regnerus, M. (2007). *Forbidden fruit: Sex and religion in the lives of American teenagers*. Oxford University Press.
26. Regnerus, M., Gordon, D., & Price, J. (2016). Documenting pornography use in America: A comparative analysis of methodological approaches. *Journal of Sex Research*, *53*(7), 873–881.
27. Sherkat, D. E., & Ellison, C. G. (1997). The cognitive structure of a moral crusade: Conservative Protestantism and opposition to pornography. *Social Forces*, *75*(3), 957–980.

28. Stack, S., Wasserman, I., & Kern, R. (2004). Adult social bonds and use of internet pornography. *Social Science Quarterly*, *85*(1), 75–88.
29. The Journal Record (2024, November 26). Oklahoma age registration for porn sites goes into effect. Retrieved May 6, 2026, from https://journalrecord.com/2024/11/26/oklahoma-age-registration-for-porn-sites-goes-into-effect/
30. Wilkin, P. (2004). Pornography and rhetorical strategies: The politics of public policy. *Media Culture & Society*, *26*(3), 337–360.

Footnotes

1. https://support.google.com/trends/answer/4365533?hl=en

Figures

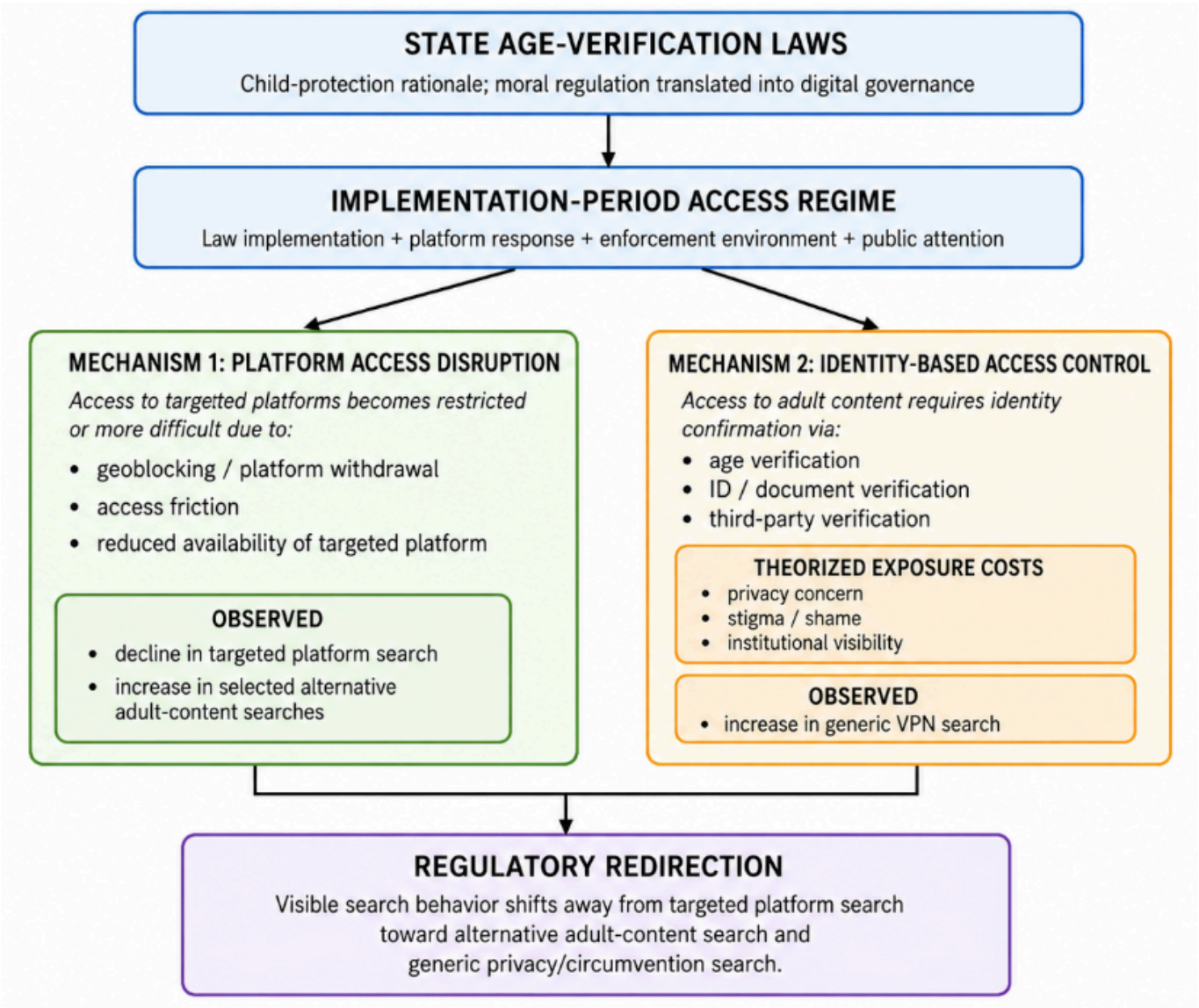


Figure 1

Conceptual Framework: State Age-Verification Laws, Implementation-Period Access Regime, and Regulatory Redirection

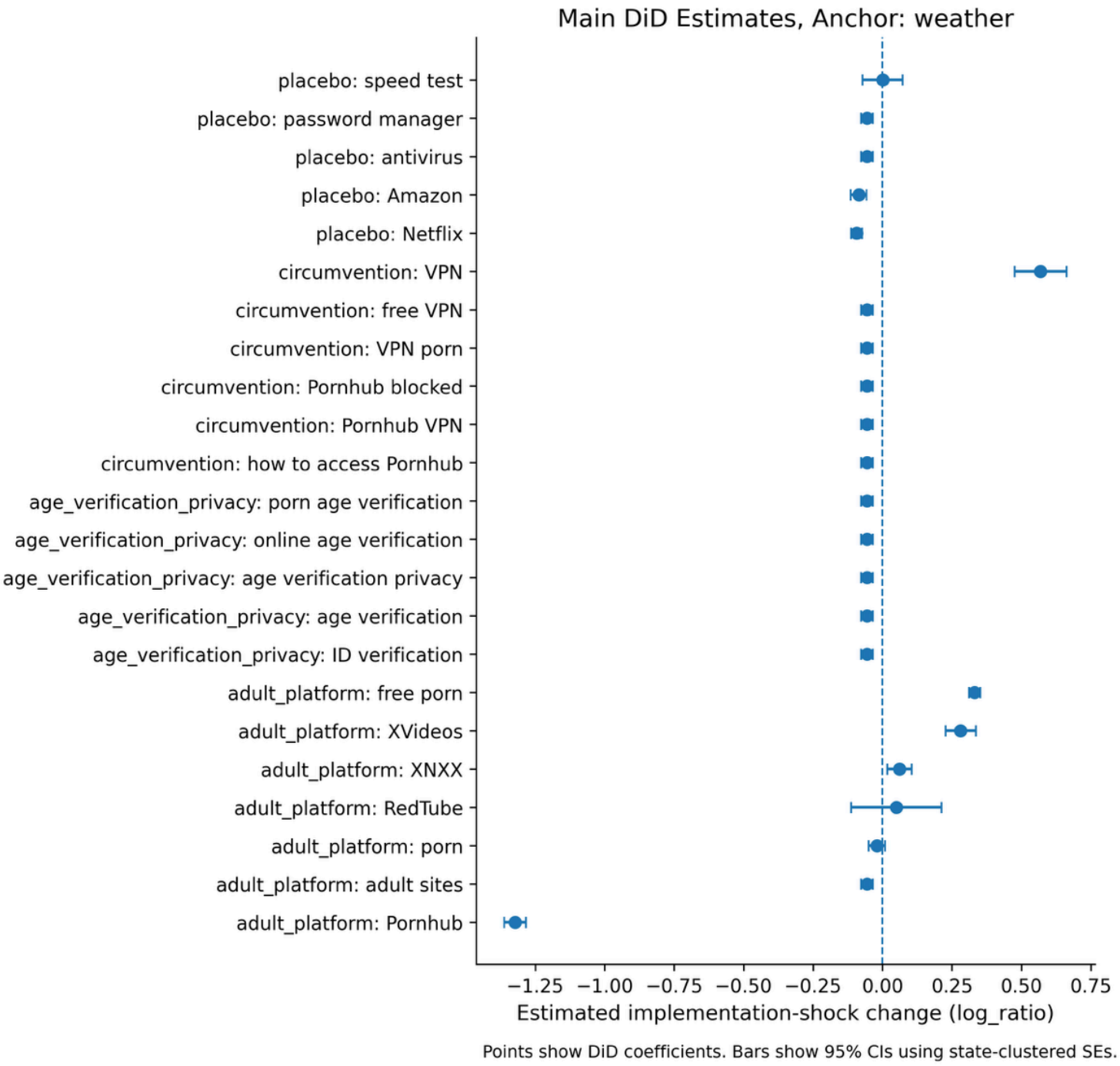


Figure 2

Main Difference-in-Differences Estimates Using Weather Anchor.

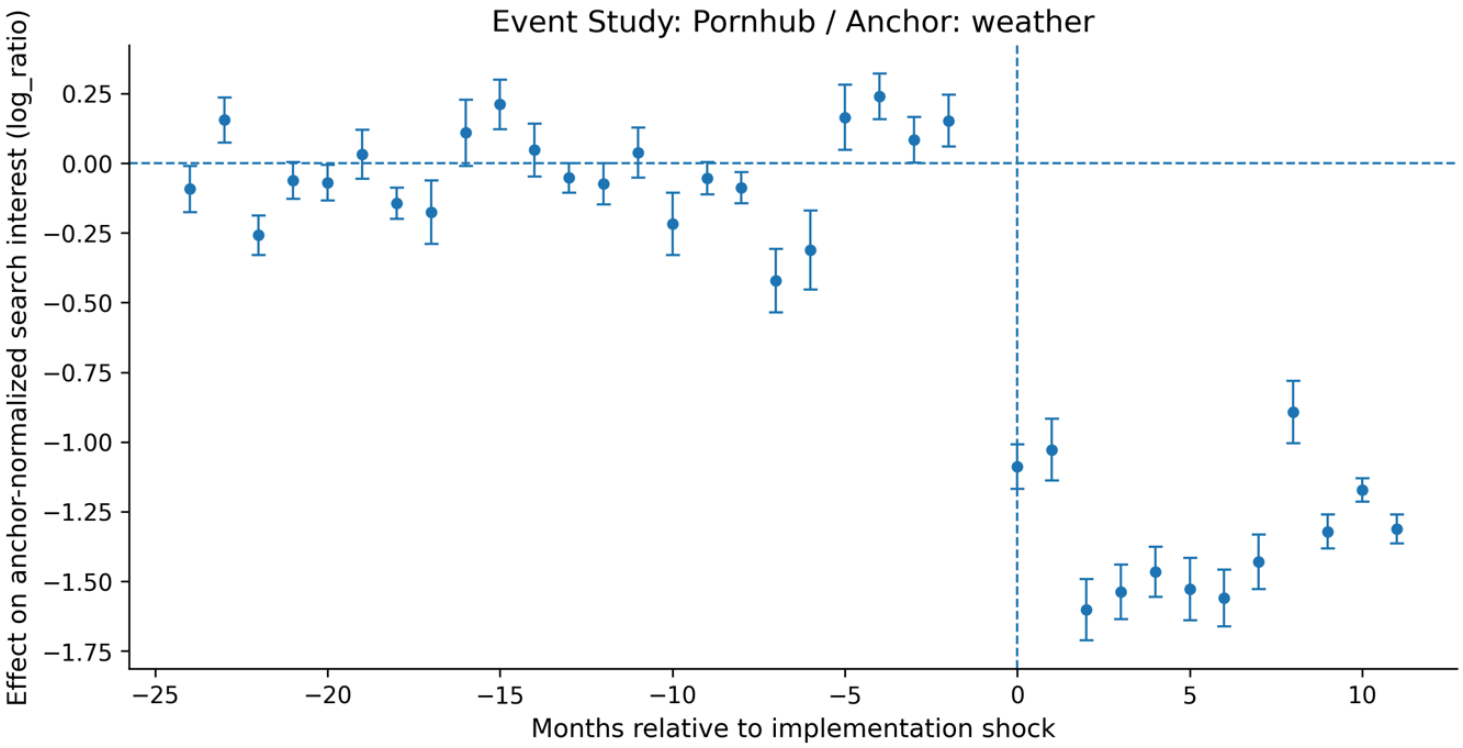


Figure 3

Event-Study Estimates for Pornhub Search Interest.

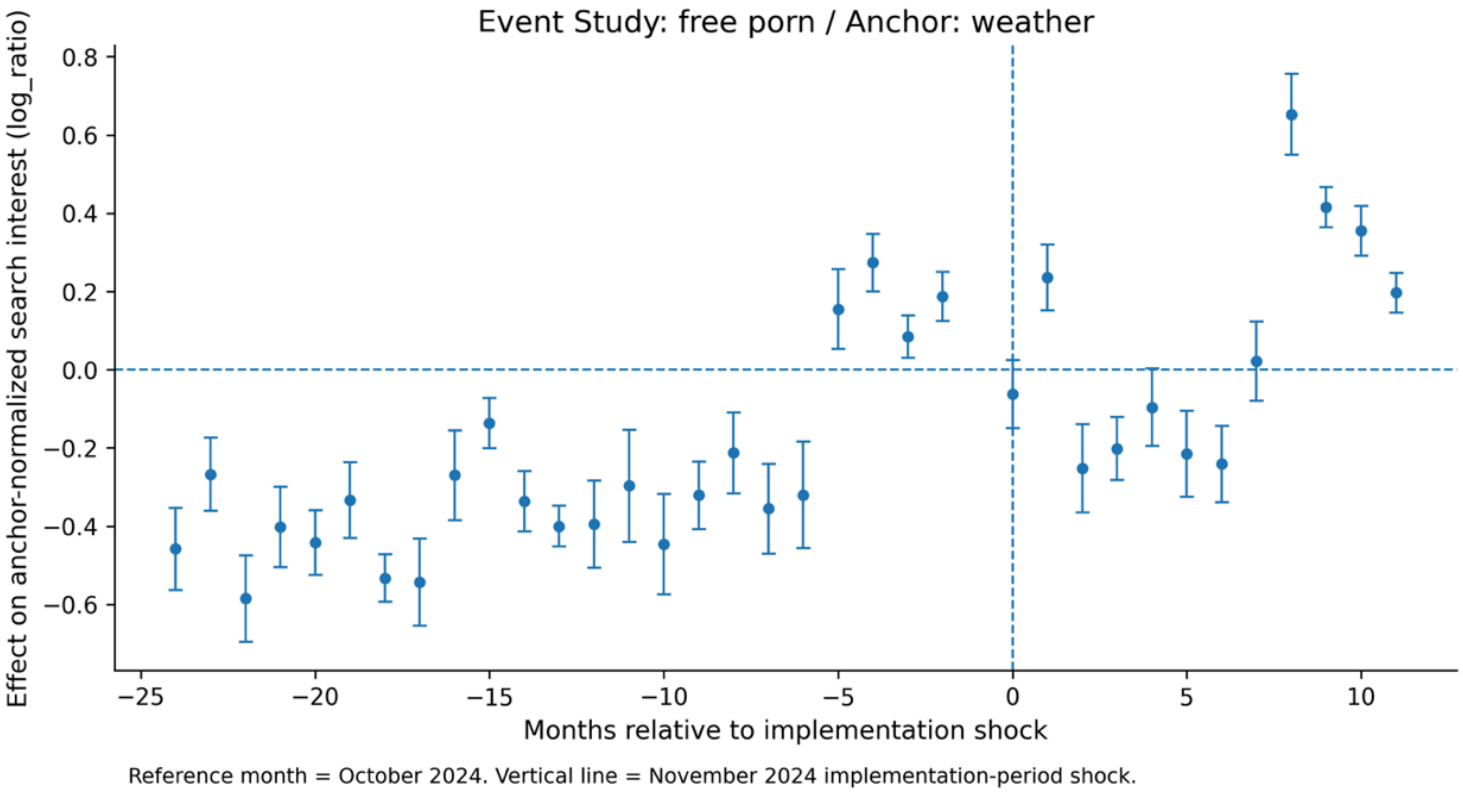


Figure 4

Event-Study Estimates for Alternative Adult-Content Search

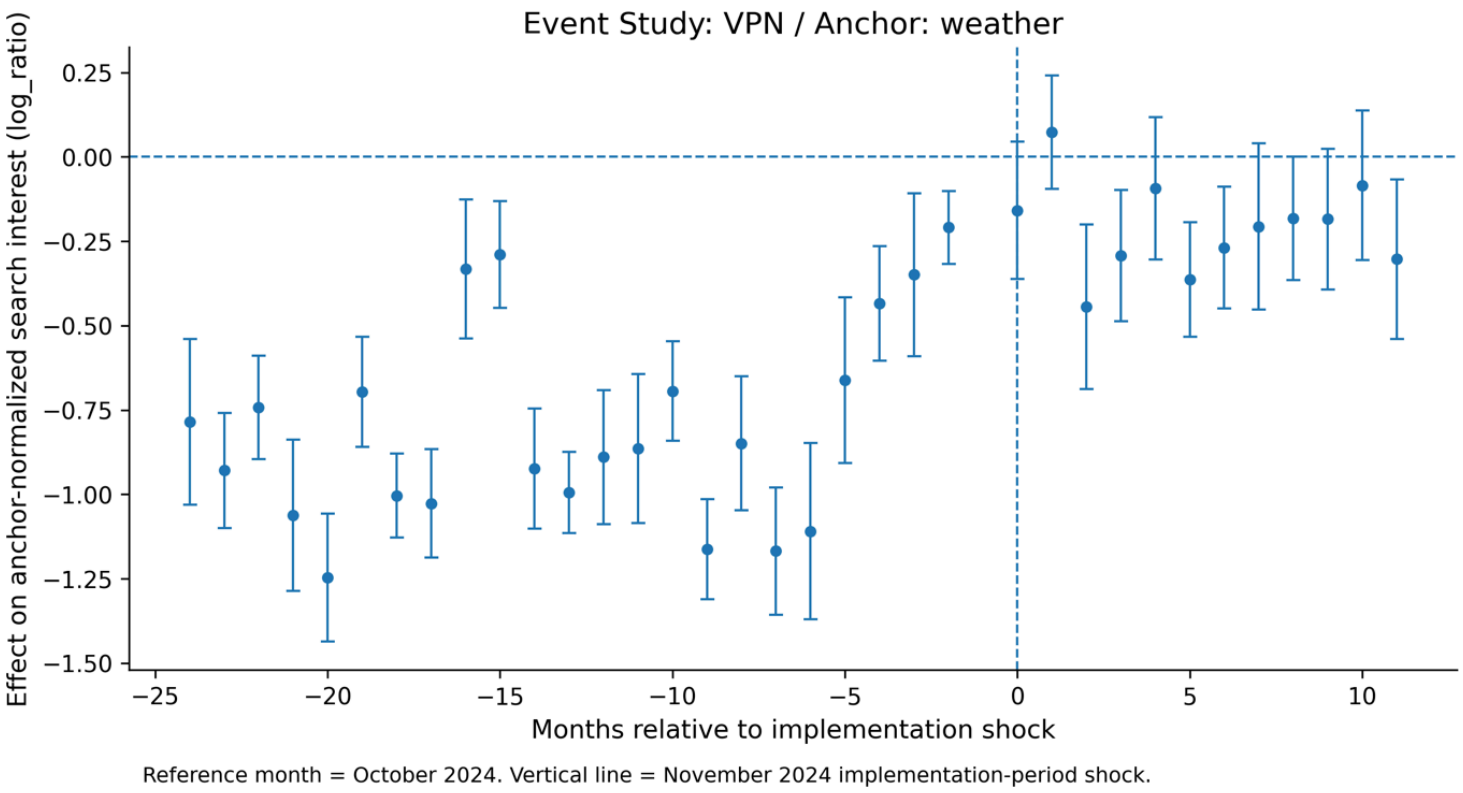


Figure 5

Event-Study Estimates for VPN Search Interest

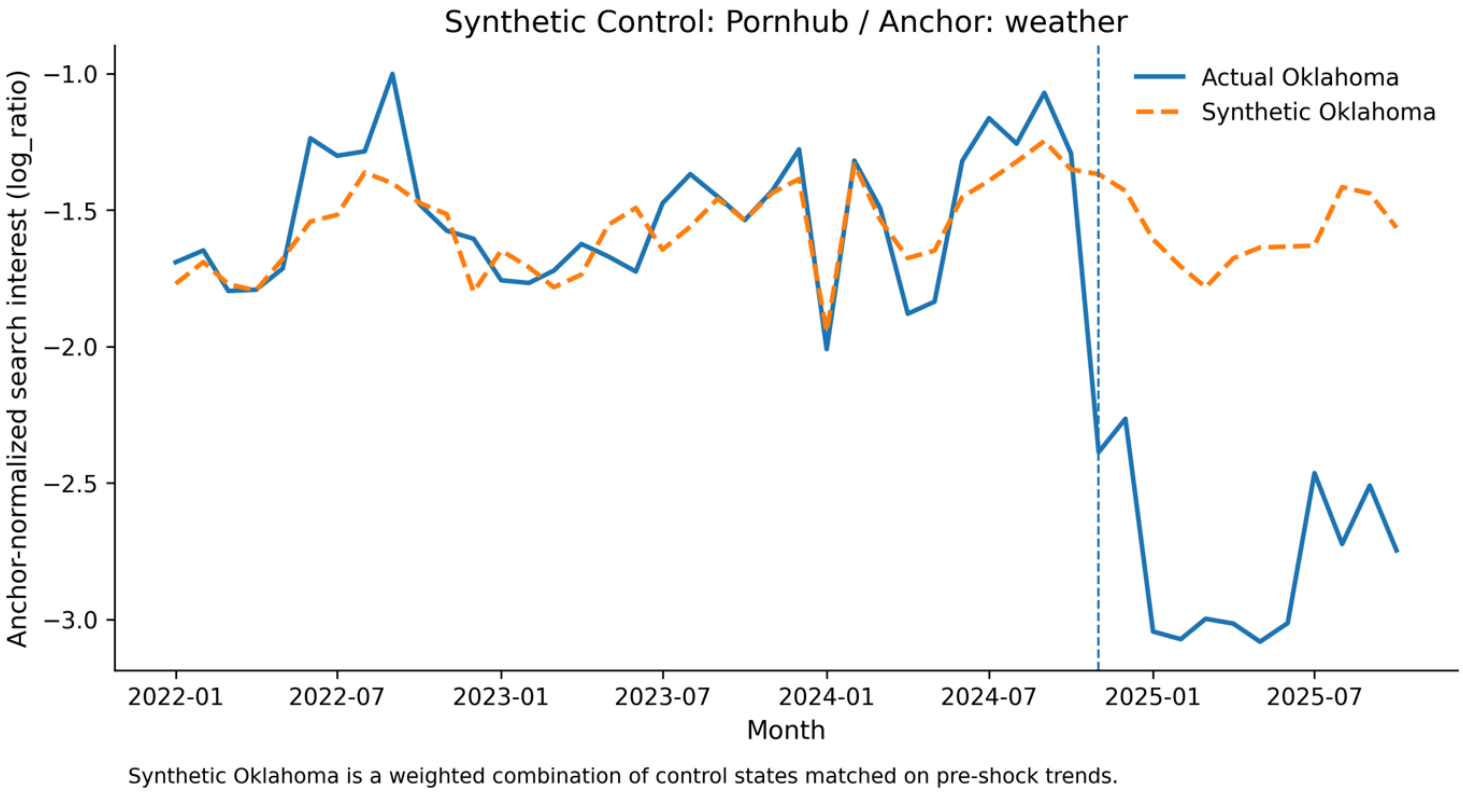


Figure 6

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- 4.AppendixA.docx