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### "She Blinded Me with Science": The Use of Science Frames in Abortion Litigation Before the Supreme Court

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**“She Blinded Me with Science”: The Use of Science Frames in Abortion Litigation Before  
the Supreme Court**

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## Abstract

While much of the work on amicus briefs focuses on whether such briefs affect Supreme Court outcomes or doctrine, much less is known about the content of these briefs, particularly how groups opt to frame issues as part of their litigation strategy. In this study, I leverage an approach to content analysis that has previously been used to analyze judicial opinions and use it to assess the frames used by amicus groups in a single policy area over four decades. Using an original dataset of amicus briefs filed in Supreme Court cases on the right to abortion, I test the claim from the social movement literature that antiabortion groups have adopted the language of science in the post-*Roe* era. However, I find only limited support for such a shift, suggesting that litigation strategies may not track framing approaches used in other venues. Among antiabortion amici, only health organizations rely upon science framing, partially neutralizing the monopoly that prochoice health organizations had established with respect to scientific claims. By comparison, prochoice groups generally employ more science framing in their briefs than prolife groups and show evidence of calibrating this frame in response to changes in doctrine and court composition. Beyond its contributions to illuminating the movement-counter-movement dynamics in abortion litigation, this study offers an approach that could be easily adapted to the study of other policy areas, contributes to the literature on social movements and framing, and advances our understanding of how organized interests assert themselves through the amicus curiae brief.

**Keywords:** abortion, framing, amicus brief, Supreme Court

## **“She Blinded Me with Science”: The Use of Science Frames in Abortion Litigation Before the Supreme Court**

*“The framing wars are very important, they are vital. People retain very little, so having the right phrase or way of talking about an issue is key.”*

*--Representative, NARAL (June 16, 2006)*<sup>1</sup>

*“I refuse to show pictures of dead babies ... That’s what the old way was, and that’s why they were losing all these years.”*

*-- Leslee Unruh, Vote Yes For Life*<sup>2</sup>

In contested policy areas like abortion, organized interests devote a great deal of energy in developing communication strategies for engaging with the public, the media, and policymakers. The ability to persuade these audiences often turns on how the policy issue is framed (Kahneman and Tversky 1984), as seen in the quotes from the activists above. But most of what we know from the literature on social movements and framing focuses on how movements engage with the media and the public, which overlooks another important venue that social movement organizations use to push for policy change and to raise visibility: the courts. And perhaps no policy issue is more entangled with the American judiciary than that of abortion. The Supreme Court’s role in articulating a constitutional right to an abortion has made it the subject of campaign rhetoric at both the state and federal levels (Abramowitz 1995; Roh and Haider-Markel 2003) and a target for court-curbing legislation (Clark 2009). The abortion issue has also become a major factor in selection of nominees to the High Court over the past four decades (Collins and Ringhand 2013; Keck and McMahon 2016) and influences appointment politics for lower courts as well (Steigerwalt 2010).

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<sup>1</sup> Quoted in Gerrity (2010: 60).

<sup>2</sup> This quote is drawn from a *New York Times* article by Monica Davey (November 1, 2006), “National Battle over Abortion Focuses on South Dakota” (quoted in Siegel 2008: 1643).

Increasingly, scholars have observed that state laws limiting access to abortion have been premised on claims such as fetal pain, asserted links between abortion and breast cancer, mental health risks for women seeking abortions, and the asserted need for physicians who perform abortions at clinics to have admitting privileges at nearby hospitals (Huff 2014; Guttmacher Institute 2018; Howe 2020). Case studies of the antiabortion movement have argued that this is part of a shift in strategy intended to make opposing abortion more palatable to a wider segment of the public and to emphasize scientific and medical claims about abortion's negative impacts (Wolliver 1998; Gerrity 2020; Rose 2011).

When abortion restrictions are the subject of litigation, as was the case in the 2016 Supreme Court abortion decision (*Whole Woman's Health v. Hellerstedt*), the arguments of the litigants are accompanied by a chorus of other voices, who express their views on how the Court should rule through amicus curiae ("friend of the court") briefs. Compared to the cost of sponsoring test cases (Collins 2012), amicus filings are relatively inexpensive and help interest groups fulfill goals related to both policy (Wofford 2020) and organizational maintenance (Solberg and Waltenburg 2006). Filings of amicus curiae briefs have also increased dramatically in the modern era of Supreme Court litigation (Collins 2012; Kearney and Merrill 2000).<sup>3</sup>

Unfortunately, we know very little about the actual arguments raised in amicus briefs. Most of the existing research focuses on the extent to which amicus briefs help inform justices' votes and doctrine based on which side they support (Pacelle et al. 2018; Black and Owens 2011; Collins 2008; Spriggs and Wahlbeck 1997). The little work that examines the content of amicus

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<sup>3</sup> The percentage of Supreme Court cases with amicus participation increased from about 60 percent in 1970 to around 97 percent during the Roberts Court (Collins 2012; Pacelle et al. 2018).

briefs either takes a broad perspective across all issue areas (Wofford 2015; 2020) or analyzes a small number of cases (Behuniak-Long 1991; Moyer, Balcom, and Hendricks 2019).<sup>4</sup> However, it is unclear whether these conclusions from this work hold up within a specific policy area over a long period of time.

This paper has two main aims. First, I use amicus filings in Supreme Court abortion litigation from 1973 to 2016 to assess whether a claim from the social movement literature about the pro-life shift to science framing (Wolliver 1998; Gerrity 2020; Rose 2011) is supported in the litigation context. Was the science frame heavily relied upon by prolife amici, only adopted by certain types of organizations, or minimized relative to other frames? Did framing by prolife groups shift in response to changes in legal doctrine or personnel changes on the Supreme Court? Second, the paper showcases a promising new approach that extends techniques previously used to study opinion content and demonstrates how they can be used to analyze amicus framing in a single policy area over time.

Why focus on science as a frame? As the Science and Technology Studies (STS) literature explains, framing an argument in scientific terms is a way to demonstrate credibility and assert status (Epstein 1996; Layzer 2012). It is also a way to elevate and insulate claims, by asserting that they are based on neutral and objective evidence, are unaffected by political forces (Ahmed 2015), or come from experts. For judges looking to avoid moral pronouncements, framing an issue in the language of science may provide an attractive way for judges to project

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<sup>4</sup> As discussed later, Moyer, Balcom, and Hendricks (2019) employ only descriptive analyses on briefs filed in four abortion cases, while Behuniak-Long (1991) analyzes framing in a single abortion case. While illuminating, these studies do not enable us to draw conclusions about abortion litigation over an extended period of time.

objectivity in their rulings (Chesler, Sanders, and Kalmuss 1988). Adopting a science frame in an amicus brief could also neutralize an opponent's monopoly on that frame and lessen their influence (Solowiej and Collins 2009).<sup>5</sup> However, judges' lack of familiarity with scientific methods may also make such frames less impactful (Hafemeister and Melton 1987).<sup>6</sup>

In the sections that follow, I discuss how science frames have been employed in public policy narratives and compare prolife and prochoice approaches to framing the issue of abortion. Then I lay out my hypotheses and test them on an original dataset of 359 amicus briefs filed over four decades in Supreme Court litigation. The results suggest that earlier research has overstated the extent to which abortion opponents changed their framing approach to emphasize science; the findings also raise the possibility that the litigation context relies on different frames than other kinds of outlets for advocacy. I conclude by discussing other applications for the methodological approach used here and identifying directions for future research.

### **The Use of Science Frames in Public Policy Narratives**

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<sup>5</sup> While Supreme Court influence is outside the scope of this paper, it is certainly reasonable to assume that amici wish to persuade the justices to adopt favorable policy. However, using a science frame could be part of a neutralizing strategy (Solowiej and Collins 2009) or tied to an organization's efforts to distinguish itself from others within the same policy space (Solberg and Waltenburg (2006).

<sup>6</sup> Social scientists generally agree that judges are not well-equipped by their training to assess scientific evidence themselves (Guthrie et al. 2001; Foster and Huber 1997) or to evaluate conclusions drawn by those asserting themselves as scientific experts (Benton et al. 2006; Beecher-Monas 1998; Gatowski et al. 2001). Nevertheless, established legal doctrine (e.g., *Daubert v. Merrell Dow Pharmaceuticals* 1993) often requires judges to do both of these things.

Entman (1993: 52) argues that framing is primarily about selection and salience: to “select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation.” While frames serve as a simplifying tool for helping individuals interpret the world around them (Goffman 1974; Kahneman and Tversky 1984), they also are commonly understood as strategic mechanisms for political actors and the news media to shape others’ understanding (Merry 2013; Chong and Druckman 2007; Glazier and Boydston 2012). As Benford and Snow (2000) note, social movements employ frames in an active, evolving process to construct meaning, often in response to the narratives and positions their opponents have taken.

Framing a policy debate in scientific terms has important implications for both public understanding and the formulation of public policy. Layzer (2012: 6) notes that scientific claims carry more weight because of the status and cultural authority that science has in the U.S. Characterizing an issue in terms related to science can be a way for a social movement to enhance credibility and legitimacy among the public and key decisionmakers, in part by appealing to scientific values like objectivity and intellectual rigor. Existing work has highlighted the use of science frames in news coverage about genetically modified food (Yang, Xu, and Rodriguez 2014) and molecular medicine (Ruhmann et al. 2015), public debates about fluoridation of water (Martin 1991) and teaching of evolution in schools (McCune 2003), as well as predicting public attitudes about stem cell research (Stewart, Dickerson, and Hotchkiss 2009).

Within a single policy area, opposing sides may employ science frames in different ways. For instance, in environmental policy, Layzer (2012) observes that

“advocates of more protective environmental policies publicize the worst-case scenarios hypothesized by scientists, overstate the certainty of scientific knowledge, and press for an



early and stringent—or precautionary—policy response to avert catastrophe. By contrast, opponents of such policies typically emphasize the uncertain state of current knowledge or, if there is a strong scientific consensus that an environmental problem is genuine, highlight dissenting views within the scientific community as to its magnitude, causes, or consequences.”

This is illustrative of the way that social movement organizations can actively contest the way that a frame is used by another group (Boscarino 2016) or challenge an opponent’s existing monopoly on a particular frame (such as science).

One prominent perspective in the literature on science framing is the deficit, or science literacy, model which assumes that attitudes about particular policies may be attributable to a knowledge deficit that, once rectified, can lead to persuasion (Nisbet and Goidel 2007: 421). This is the typical position held by public advocacy organizations and many educational institutions, who seek to make the public and policy makers more “literate” on scientific matters. However, the empirical support for this perspective is not encouraging, in large part due to cognitive biases such as motivated reasoning (Nyhan, Reifler, and Ubel 2013; Nyhan et al. 2014; Hart and Nisbet 2012; Nisbet 2005).

With respect to the framing of medical conditions, organizations and movements may invoke medical experts such as physicians, research scientists, professional associations, and scientific organizations in order to establish credibility (Epstein 1996). These experts and their conclusions are often presented by social movements in ways that minimize or altogether ignore the political, cultural, or social context in which the expert operates but that highlight the values of technical skills and objectivity (Ahmed 2015). Scientists themselves will engage in what is known as “boundary work” to set themselves apart from non-scientists, who are not given access to resources or professional stature and are viewed less favorably (Gieryn 1983). At the same time, movements that employ science frames also utilize so-called “lay experts” (Huff 2014;

Epstein 1995; Wynne 1992), whose personal experiences or unique vantage points (e.g., as a survivor of a disease or victim of an environmental disaster) may be deemed important for scientific debates.<sup>7</sup> In arguments where credentialed experts can be found on both sides, lay experts may also serve as tie breakers. For instance, Ahmed (2015: 108) notes that in *Gonzales v. Carhart*, where physicians were found on both sides of the case, Justice Kennedy detours around the medical evidence and focused on lay experts from an amicus brief. This amicus brief contained first-person anecdotes from women who had previously had abortions, collected by an antiabortion initiative called Operation Outcry (Huff 2014; Ahmed 2015).

There are some notable examples in Supreme Court litigation of impactful briefs that rely on arguments tied to science. The earliest and most well-known instance of science framing in an amicus brief was the Brandeis brief filed in *Muller v. Oregon* (1908), which cited heavily from medical and sociological academic journals as part of an argument supporting “protective” laws for women workers. And in the NAACP school desegregation litigation, the work of social psychologists (Clark and Clark 1947) was used to establish negative psychological impact of segregation on children and was picked up by Chief Justice Warren in his *Brown v. Board of Education* opinion. Significantly, the involvement of social scientists continued after *Brown* and was soon adopted by pro-segregation litigants, who emphasized different scientific studies and

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<sup>7</sup> An illustration of the dichotomy between experts and lay experts comes from Huff (2014: 316-318). In South Dakota, a prochoice member of a state legislative task force on abortion wanted expertise to be signaled by publication in peer reviewed outlets with disclosure of financial backing, while a prolife member wanted women who had undergone abortions to testify as experts as well, saying “an expert is someone who has experienced something.”

experts than their opponents (Chesler, Sanders, and Kalmuss 1988). This provides yet another example of both sides in a policy debate employing a science frame.

With this background in mind, I next turn the focus to the ways that abortion has been framed by both its supporters and its opponents in the United States.

### **Framing Support for and Opposition to Abortion**

It might seem unremarkable that abortion-related interest groups would frame the issue in scientific terms. Abortion is, after all, a medical procedure. Yet, like policy debates over AIDS and obesity, abortion sits at the intersection of medicine and morality (Saguy and Riley 2005) and is a key mobilizing issue for both major political parties within the contemporary political sphere (Wilcox and Norrande 2002; Abramowitz 1995; Adams 1997). In the abortion policy space, the prolife and prochoice movements have been extremely active in litigation, which they have pursued alongside other strategies such as lobbying for favorable legislation, endorsing (or opposing) candidates, organizing protests, and crafting public appeals.

Within the social movement context, framing is characterized by adaptation and contentiousness. Evolution in the use of particular frames can reflect changes within movements or among subsets of activists (Benford and Snow 2000), and interest groups do not necessarily shy away from contesting the frames used by their opponents (Boscarino 2016). Drawing on these insights, below I identify trends in the ways abortion opponents and supporters have framed the abortion issue in the public domain in the late 20<sup>th</sup> and 21<sup>st</sup> centuries.

#### *Frames used by the prochoice movement*

Leading up to *Roe*, supporters of liberalizing abortion laws relied in part on frames related to science such as public health and population control (Greenhouse and Siegel 2011).<sup>8</sup> Population control was initially seen as a pragmatic alternative argument in spaces where the women's movement was not popular, but the racial politics related to this frame presented a different set of problems by relying upon racist stereotypes about women of color (Ziegler 2013: 20-24).

Concerns about dangerous “back alley” abortions were an important impetus for the formation of a diverse coalition of groups supporting legal abortions, including both medical and religious groups (Rosenberg 1995). Along similar lines, Planned Parenthood raised concerns in its *Roe* amicus brief about the disproportionate harm to poor women stemming from lack of access to abortion (Ziegler 2013). Backlash from the rubella outbreak in California in the 1950s and 60s was also instrumental in generating support for legalizing abortion among the medical community (Rosenberg 1995).

Indeed, the language of the *Roe* majority offered encouragement for conceptualizing abortion in ways related to science and scientific authority. Ahmed (2015: 90) writes that in *Roe*, “the Supreme Court painted a picture of medical experts detached from their social and political contexts [and i]n doing so, the Court was able to defer to expertise understood to be objective, neutral, and apolitical on a highly contested issue.” In part because the Supreme Court's decision

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<sup>8</sup> While the women's movement did not begin to link its objectives to the liberalization of abortion laws until the late 1960s and early 1970s, conservative activists like Phyllis Schlafly famously connected abortion to the Equal Rights Amendment, which undermined support for its ratification (Greenhouse and Siegel 2011).

did not emphasize population control, this argument fell out of favor with prochoice groups after *Roe* (Ziegler 2009; 2013). Instead, prochoice groups opted to focus on frames related to rights, autonomy, and public health concerns about illegal abortions. Evidence suggests that this emphasis continued throughout subsequent decades. One analysis of press releases from the mid-1990s finds that prochoice groups emphasized rights, privacy, and freedom and “women” (rather than “mothers” or the “unborn child”) in their public discourse (Andsager 2000).

Professional associations of physicians have also shaped the frames employed in favor of abortion rights, emphasizing public health and scientific authority. One prominent organization in this category is the American College of Obstetricians and Gynecologists (ACOG), which has been a frequent filer of amicus briefs. While ACOG’s early position on legal abortion reflected concerns about entering into the political fray (Aries 2003), in the post-*Roe* era through the present day, ACOG has taken a strong position in opposition to many abortion regulations. For instance, a 2014 bulletin from ACOG’s Committee on Health Care for Underserved Women called for “advocacy to oppose and overturn restrictions, improve access, and mainstream abortion as an integral component of women’s health care.” ACOG has also published research bulletins that criticize the methodological flaws in studies relied upon by prolife groups which assert a causal link between abortion and breast cancer (ACOG 2009). As such, ACOG and other aligned professional associations sought to establish their authority on the basis of scientific expertise – a frame which was soon contested by the opposing side.

### *Frames used by the prolife movement*

In the time period leading up to and just following *Roe*, scholars have documented efforts by the Republican party to court Catholic voters by taking a position against abortion

(Greenhouse and Siegel 2011), though the Nixon administration opted not to file a brief in the *Roe* litigation. In the 1970s, the Republican Party was also capitalizing on an increasingly close relationship with evangelical Protestant groups (Martin 1996), who founded groups like the Moral Majority, the Family Research Council, and Focus on the Family that all opposed abortion (Huff 2014). No doubt because of the prominence of these religious groups, the morality frame for opposing abortion was dominant in the early years of abortion litigation.

However, some in the antiabortion movement were concerned that the movement had become too closely linked with “anti-woman” sentiment (Huff 2014). Indeed, public opinion on abortion remained fairly static in the two decades following *Roe* (Rosenberg 1995), and polls consistently found that a majority of Americans held the view that abortion should be legal in some, but not all, circumstances (Pew 2017). Some antiabortion groups in the 1990s recognized that a change in rhetoric emphasizing concern for women could have more persuasive value because it foregrounded a desire to protect vulnerable women (Ziegler 2018; Cannold 2002; Rose 2011). One prolife activist characterized the shift like this:

“It is the widespread belief that ‘legal’ means ‘safe’ which is seducing the middle majority of Americans. Even though they are uncomfortable with the fact that unborn children are being killed, they tolerate abortion because they believe the lie that: ‘At least women are being helped.’ But once this lie is exposed, the middle majority’s thoughts will dramatically change. At that point the middle majority will begin to ask themselves: ‘If abortion is causing women so much suffering, what are we doing this for?!’” (quoted in Cannold 2002: 172).

Case studies of the antiabortion movement note that, from the 1990s on, there was a greater interest in utilizing arguments framed in scientific terms about purported linkages between abortion and breast cancer, mental illness, and infertility (Huff 2014; Rose 2011). In 1999, two prolife organizations (the Breast Cancer Prevention Institute and the Coalition on Abortion/Breast Cancer) were established to promote research and public education on the

supposed link between breast cancer and abortion. Both took issue with organizations like the Centers for Disease Control and Prevention, the American Cancer Society, and the National Cancer Institute, all of which rejected the link between abortion and breast cancer incidence (Huff 2014: 109).

A key component of the “pro-woman” strategy was the emphasis on something that abortion opponents called “post-abortion syndrome” or PAS, which asserted that women who had undergone abortions would suffer negative emotional and psychological trauma as a result (Dadlez and Andrews 2010).<sup>9</sup> Kelly (2014) argues that evangelical crisis pregnancy centers were responsible for the genesis of the concept of PAS as early as the 1970s, began collaborating with conservative think tanks in the 1980s, and were successful in diffusing the concept of “post-abortion syndrome” to conservative policy makers in the 1990s. The linkage with crisis pregnancy centers made it easier for the antiabortion movement to identify women who had negative experiences surrounding abortion and who could serve as “lay experts” (Wynne 1992) in court filings, testimony before legislative bodies, and in public relations materials. For example, one amicus filing in the 2016 *Whole Woman’s Health v. Hellerstedt* case was entitled “The Brief of Sandra Cano and 180 Women Hurt by Abortion” and contained first-hand narratives from women who had undergone the abortion procedure.

Another way in which antiabortion groups utilized scientific frames was the way in which they employed the language of science to critique prochoice arguments; this is consistent

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<sup>9</sup> Because of the questionable credentials of researchers involved with the term (Dadletz and Andrews 2010; Blanchard 2002) and the nature of the evidence used to support the research claiming to have identified the effect, the mainstream medical community generally does not recognize PAS as an established medical condition (Kahn 2002; Billings 2002; Goddick 2002).

with Meyer and Staggenborg (1996), who note that the presence of one movement in a venue can force the opposing movement also to operate in that space (see also Solowiej and Collins 2009). Credibility tactics used by abortion opponents are similar to those used in policy debates over tobacco use and climate change, particularly the approach of “selling doubt” (Ley 2018; Ziegler 2019; Huff 2014; Oreskes and Conway 2010). For instance, in *Gonzales v. Carhart*, one prolife medical group (the American Association of Pro Life Obstetricians and Gynecologists) critiqued three studies cited by the respondent as not being peer-reviewed or as being simply anecdotal in nature (Ahmed 2015). In the next section, I explore further the rationales behind framing choices made in amicus briefs.

### **Framing and amicus briefs**

Why do groups choose to file amicus briefs? The obvious answer is to influence legal policy, and there is compelling evidence that amicus briefs filed in the U.S. Supreme Court can affect both justices’ votes (Pacelle et al. 2018; Collins 2008; Kearney and Merrill 2000) as well as doctrine (Collins, Corley, and Hamner 2015; Wofford 2015). Existing research has also established that groups will sometimes take advantage of the adversarial structure of the American legal system and pursue a “neutralizing” strategy against policy opponents who file amicus briefs, especially in constitutional cases. Solowiej and Collins (2009: 676) note that counteractive lobbying through amicus briefs is done in order to “both negate their opponents’ influence and to etch their own policy preferences into law.”

However, Solberg and Waltenburg (2006) argue that litigation serves other purposes, namely attracting new membership, keeping existing membership, and helping the organization stake out its territory in crowded policy spaces. Filing amicus briefs can heighten a group’s



visibility and give it judicial experience that can be capitalized upon in future cases (Behuniak-Long 1991: 269). Of course, litigation is typically pursued alongside other, more visible forms of advocacy that may be more likely to attract and retain members (Solberg and Waltenburg 2006: 565).

The framing utilized in amicus briefs will thus reflect the goals of the group or groups who signed the brief. In particular, the use of science framing has special implications for professional associations of healthcare providers, who have a vested interest in the boundary work of distinguishing between “science” and “non science” (Gieryn 1983). Drawing on existing work (Huff 2014; Ahmed 2015), I operationalize science framing to include language that emphasizes the expertise of scientists and medical professionals and that relies on the neutral terminology of empirical and clinical research. Science framing is distinct from discourse that seeks to provoke an emotional reaction to individual women’s experiences, either by using charged language (e.g., calling abortion providers “murderers”) or focusing on anecdotes of individual women’s (negative) experiences. Instead, a prolife amicus brief that frames its arguments in terms of science might discuss the prevalence of “post abortion syndrome” by referencing empirical data gathered by a research organization and published in a peer-reviewed journal.

Beyond science framing, the literature suggests other frames that should also be prevalent in amicus briefs. One such frame that should be used found in amicus briefs from both sides of the abortion is a rights frame (Behuniak-Long 1991), which serves to connect their support or opposition to a Constitutional framework (e.g., “right to privacy,” “right to life”). I conceptualize this frame broadly to include discourse that also references terms like liberty, equality, freedom, dignity, and autonomy.

As discussed earlier, abortion opponents have historically couched their arguments in terms of morality (Rohlinger 2002, 2006; Rose 2011), as well as more recently adopting the frame of “harm to women” (Kelly 2014; Rose 2011).<sup>10</sup> For the purposes of this analysis, I follow the literature in conceptualizing morality framing to include language that emphasizes the moral repugnance of abortion (e.g., references to killing or murder), that describes fetuses as children (e.g., references to unborn child), and that refers to women as “mothers” (Wolliver 1998). In contrast, the “harm to women” frame refers to women-protective language that is intended to evoke an emotional reaction about women’s experiences with abortion (or unwanted pregnancies), often centering anecdotal accounts that emphasize negative psychological or physical outcomes. While morality framing is most closely linked with the prolife movement in the literature (Rohlinger 2002, 2006; Rose 2011), both sides of the abortion debate can employ the harm to women frame (Huff 2014; Jesuadson and Weitz 2015). For instance, a prochoice group might center a particular woman’s traumatic experience with domestic violence as a reason for her to have access to abortion services, while a prolife group might highlight a woman from Operation Outcry who experienced grief and depression as a result of an abortion.

In general, the literature suggests that prolife groups should be less apt to use science frames than prochoice groups. But, because of organizational maintenance goals, some types of amici will be especially likely to make appeals to credibility that entail science framing.

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<sup>10</sup> Both of these frames serve organizational maintenance objectives: the former, by resonating with evangelicals and Catholics who were already supporters of the movement, and the latter by attempting recruit more supporters through communicating compassion for women who seek abortions (Reardon 1996).

Specifically, groups in the healthcare and health policy sector as well as single-issue groups in the abortion or reproductive rights policy space will have a stronger incentive to couch their legal arguments in the language of science, compared to religious groups. This leads to the following expectations:

*H<sub>1</sub>: All else equal, the science frame will be used less frequently in prolife briefs than in prochoice briefs.*

*H<sub>2</sub>: Amicus briefs from healthcare or health policy groups will use more science framing than briefs from religious groups.*

*H<sub>3</sub>: Amicus briefs from abortion-oriented groups or reproductive rights groups will use more science framing than briefs from religious groups.*

Drawing from the social movement literature, I expect that the strategies of abortion opponents and supporters will be dynamic (Solowiej and Collins 2009; Meyer and Staggenborg 1996; Jesudason and Weitz 2015), and that within each movement, there will not be a monolithic approach (Rohlinger 2006; Ziegler 2013). As such, amicus briefs are likely to use a mix of strategies in order to present their position, though the particular mix will vary depending on whether the brief takes a prolife or prochoice position. Case studies on prolife movement strategy have identified several interest groups who de-emphasized the morality frame in favor of characterizing abortion as harmful to women (e.g., Rose 2011). Some of these groups also were active in promoting asserted links between negative mental health outcomes and abortion, as well as other negative health consequences that would be described in the language of science (Huff 2014). At the same time, other prolife groups discussed abortion with morality language that focused on the fetus as a child. On the prochoice side, science frames should accompany or bolster arguments about rights, as well as harm to women.

H<sub>4</sub>: *In prolife amicus briefs, use of the harm-women frame will be positively related to the use of the science frame.*

H<sub>5</sub>: *In prolife amicus briefs, use of the morality frame will be negatively related to use of the science frame.*

H<sub>6</sub>: *In prochoice amicus briefs, use of rights frames and harm-women frames will be positively related to usage of science frames.*

### **Data and variables**

To test these hypotheses, I first obtained the full text of 359 amicus briefs from Westlaw, drawn from the merits stage of all Supreme Court cases in which the constitutional right to an abortion was the central issue. I exclude cases that deal with abortion protests because such cases focus on First Amendment claims, rather than the constitutional right to an abortion.<sup>11</sup> In order to focus on the content of legal arguments, the briefs were trimmed so that they included content only from the Summary of Argument forward, omitting introductory material (e.g., Table of Contents, Table of Authorities, Statement of the Facts). Each brief was then coded as to whether it supported the prolife position. The variable, *Prolife*, is coded as 1 if the amicus brief sides with the litigant advocating in favor of restrictions to the right to abortion, and 0 if the amicus brief sides with the litigant advocating against restrictions of the abortion right.

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<sup>11</sup> In order to preserve independence of observations, three cases that dealt with the right to abortion were not included in the analysis because the cases were either consolidated with another abortion case that year, or because there were duplicate briefs for two cases heard at the same time: *Doe v. Bolton* (1973), *Williams v. Zbaraz* (1980), *Ohio v. Akron Center* (1990).

To create measures of the science frame as well as other frames, I utilized a commonly employed automated content analysis software called Linguistic Inquiry and Word Count (LIWC), which was developed by James Pennebaker and colleagues to analyze the psychological properties of texts (Pennebaker et al. 2003; Tausczik and Pennebaker 2010). This tool has been used in a variety of studies focused on legal settings (Bryan and Ringsmuth 2016; Corley and Wedeking 2014; Owens, Wedeking, and Wolfarth 2013). However, unlike previous work, I leveraged LIWC's capacity for creating customized dictionaries in order to tailor my analysis to the abortion issue using the corpus of amicus and litigant briefs. Regardless of which dictionary (LIWC standard or customized) is employed, the software reports the percentage of words that fall into specified categories. Although LIWC (like all automated content analysis programs) has its strengths and weaknesses, it is well suited for analyses like this which require a systematic accounting of specific terms in a large corpus of texts (see also Bryan and Ringsmuth 2016).<sup>12</sup>

Ideally, this analysis would utilize dictionaries already developed and validated in the abortion literature. However, there has been no systematic analysis of framing across the entire post-*Roe* period, and the few studies that have focused on framing are hampered by either their limited focus on a single case or methodological limitations related to construction of the frames.<sup>13</sup> Thus, I opted to develop custom dictionaries that drew terms from other studies of

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<sup>12</sup> Indeed, as of 2010, LIWC was used in 121 published research studies across the social sciences (Tausczik and Pennebaker 2010).

<sup>13</sup> Specifically, Andsager (2000) content analyzes one year of press releases and news stories about late-term abortion, while Behuniak-Long content analyzes legal arguments filed in a single case (*Webster v. Reproductive Health Services*). Given the emphasis of this manuscript, a more promising approach was employed by Moyer, Balcom, and Hendricks (2019), who descriptively compare three frames (morality, harm-women, and science) used by amici in four abortion cases

movement strategy that used primary source documents from prolife and prochoice groups (Huff 2014; Rose 2011; Gerrity 2010; Wolliver 1998; Andsager 2000). Each custom dictionary included words that were unique to the frame, so there was no overlap between constructs.<sup>14</sup> I then validated the custom dictionaries with terms in the LIWC 2015 standard dictionary, which has been shown to have strong external validity (Frimer et al. 2015; Kahn et al. 2007).

Appendix A lists the words that appear in the custom dictionaries for the four frames created specifically for this analysis: *science*, *morality*, *harm-women*, and *rights*. The dependent variable, *science*, encompasses terms that denotes professional expertise, clinical language, and scientific research. As expected, this variable is highly correlated with two related terms (*biology* and *health*) from the LIWC 2015 standard dictionary (both at  $r = .65$ ). As expected, it is not closely correlated with emotional language in general ( $r = .03$ ) and negative emotional language in particular ( $r = .04$ ).

The other three frames serve as control variables in the analysis. *Morality*, which emphasizes the moral repugnance of abortion and equates abortion with murder, is moderately

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using LIWC. However, because of the degree to which there was overlap in the terms used for the *science* frame and the *harm-women* frame, it was not possible to isolate the extent to which individual frames were employed, necessitating a different approach. Moreover, the Moyer, Balcom, and Hendricks (2019) analysis is purely descriptive and does not include measures of group types or other controls.

<sup>14</sup> As noted above, the framing approach used here builds and improves upon the approach used by Moyer, Balcom, and Hendricks (2019). I revised their custom dictionaries, using four dictionaries compared to their three (adding *rights* as a frame), removed duplication of terms across frames, and validated the updated frames using the LIWC standard dictionary terms. A comparison with the frames used here shows that the *science* frame used here is correlated with the Moyer et al. *science* frame at .82, while the *harm to women* frame is correlated at .60.

correlated with the LIWC standard dictionary frame of *death* ( $r = .55$ ). The frame *harm-women* includes language that centers the negative emotional and physical experiences of women and is strongly correlated with the LIWC dictionary frame of *negative emotion* ( $r = .81$ ), which includes sadness, anxiety, and anger. Lastly, the *rights* frame includes language of authoritative legal constructs, like “privacy” and “liberty.” The LIWC standard dictionary admittedly does not have close analogs to these concepts, but *rights* is moderately correlated with *clout* ( $r = .26$ ).

According to the LIWC operator’s manual (2015), *clout* indicates that the author is speaking from a perspective of high expertise and confidence. In addition to these frames, I include a control for brief length, taking the log of the *word count* variable from the standard LIWC output to account for its skewed distribution.

The briefs were coded for a range of attributes. I include a variable, *Total Groups*, that is the total number of signees on the brief, as briefs with multiple signees may exhibit a less cohesive messaging strategy than briefs with a single group.<sup>15</sup> Because of the skewed distribution of the variable, I take the log of the total number of signees.

I also classified the types of groups who were signees to each amicus brief filed at the merits stage (see Appendix B). Most briefs (73%) had one or more signees from a single group type, while 15% were signed by two group types, and 14% by three or more group types. *Health* groups included both professional associations representing healthcare personnel (e.g., American

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<sup>15</sup> Groups may perceive a credibility advantage to collaboration with other co-signers on a brief, as opposed to solo briefs (Behuniak-Long 1991). The empirical findings on influence clearly show that not all collaborations are created equal in terms of their success in influencing Supreme Court decision (Box-Steffensmeier, Christensen, and Hitt 2013; Goelzhauser and Vouvalis 2014). However, because the focus of this paper is how groups frame their arguments, and not whether the arguments are successful, this line of work is outside the scope of this paper.

College of Obstetricians and Gynecologists (ACOG), American Association of Pro-life Gynecologists (AAPLOG) as well as health policy non-profit organizations (e.g., Elliot Institute, Guttmacher Institute). *Religious groups* include both groups who are official representatives of a religious institution (e.g., U.S. Catholic Conference of Bishops) as well as religiously affiliated groups (e.g., Family Research Council, Unitarians for Reproductive Choice).

Other group types include *professional associations* (non-healthcare associations like National Association of Women Lawyers), *social welfare organizations* (ACLU, Concerned Women for America), and *abortion or reproductive rights groups* (e.g., National Right to Life, NARAL, Planned Parenthood). Another dummy variable indicates whether there was a mix of group types including health, as briefs with some input from health-related organizations may be more likely to employ science framing than those without those groups' involvement.

I also control for two types of government briefs. First, I include a dummy variable indicating whether the brief was filed by the Solicitor General. There is substantial evidence that the Office of the Solicitor General is a formidable presence in Supreme Court litigation (Pacelle 2003; Bailey and Kamoie 2005; Deen, Ignagni, and Meernik 2003). During this time period, the Solicitor General filed a brief in six cases and sided with the pro-life position in five of those. Beyond the Solicitor General, it is relatively common for government actors, including state attorneys general, members of Congress, and state legislators to file amicus briefs (Gleason and Provost 2015; Goelzhauser and Vouvalis 2014) as a form of position taking (Mayhew 1974). In these data, 56 amicus briefs were filed by public officials at the local, state, or federal level; about two-thirds of these briefs took the pro-life position in the case. With respect to directionality, it is plausible that government signees would wish to assert their credibility through the language of science, particularly when defending restrictive abortion laws that



reference scientific concepts; however, public officials may also find it advantageous to emphasize emotional appeals over the neutral language of science. As such, I do not have strong directional expectations for either variable.

Because past research finds that amicus groups often repeat arguments raised by their aligned litigant (Wofford 2015; Collins, Corley, and Hamner 2015) and that litigants are increasingly coordinating efforts with aligned amicus groups (Larson and Devins 2016), I control for the use of science frame in the petitioner or respondent's brief, depending on the side with which the amicus aligns itself.

Lastly, the analysis accounts for the Supreme Court era in which the case was heard, an important consideration given the doctrinal shifts and personnel changes to the Court during the 1973-2016. I control for two major points in time that may have influenced the framing strategies of groups involved in Supreme Court litigation in the period after *Roe*. The first shift occurs after the Court's 1992 decision in *Planned Parenthood v. Casey*, which established the "undue burden" test. While still upholding abortion as a constitutional right, the decision allowed for more regulation of abortion throughout all stages of pregnancy than *Roe* had, so long as those policies were designed to "inform the woman's free choice, not hinder it" (505 U.S. 833 (1992)). This provided an opening for abortion opponents to highlight what they viewed as the negative health consequences of abortion for women through policies like informed consent provisions and mandatory counseling scripts (both of which were deemed acceptable in *Casey*).

The second shift on the Court that may have influenced the framing calculus of amici was the replacement of Sandra Day O'Connor with Samuel Alito in January 2006. Crucially, O'Connor had been part of the plurality ruling that declined to overturn *Roe* in 1992. In contrast, Alito was a much more conservative justice with a record of opposition to a constitutional right

to abortion (Keck and McMahon 2016). Alito’s replacement of O’Connor also had the effect of creating a new “swing” justice on the Court: Anthony Kennedy.<sup>16</sup> Although Justice Kennedy, like O’Connor, had declined to overturn *Roe* in *Casey*, he had, in a 2000 dissenting opinion, used the word “abortionist” to refer to a physician, referred to an aborted fetus as a “child,” and described a late-term abortion procedure in graphic terms as one that “ended human life” (530 U.S. at 914).<sup>17</sup> Thus, there was an incentive for antiabortion amici to de-emphasize science frames in favor of morality arguments in order to reach Justice Kennedy and a more conservative Court.

[Figure 1 about here]

## Results

Across all cases, amicus briefs filed by prochoice groups exhibit a significantly higher usage of science framing than briefs by prolife groups, as indicated by a difference-of-means test ( $p < 0.001$ ). This lends preliminary support to the prediction in Hypothesis 1 that prochoice groups will use the science frame more frequently than prolife groups. However, aggregating across the entire time period obscures potentially important differences in how each side crafted its arguments in individual cases. Figure 1 graphs the mean use of the science frame for all prochoice and prolife groups by case, showing considerable variation from case to case.

Looking at the beginning and endpoints of the time period under study reveals an interesting

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<sup>16</sup> Similarly, one study of the *Webster* case argues that appellees delegated to amicus groups the task of targeting Justice O’Connor with their arguments (Behuniak-Long 1991).

<sup>17</sup> After 2006, the High Court decided *Gonzales v. Carhart* in 2007, followed by *Whole Woman’s Health v. Hellerstedt* in 2016, and *June Services v. Russo* in 2020. *June Services* is not included in this analysis.

shift, however. In *Roe* (the first case in the series), science framing was much more prominent in prochoice briefs than their prolife counterparts, but by *WWH* in 2016, the average use of the science frame was very similar among amici on both sides of the abortion issue. This illustrates the way in which movements adopt successful strategies from counter-movements when it is strategically beneficial for them (Boscarino 2016; Meyer and Staggenborg 1996; Jesudason and Weitz 2015).

[Figure 2 here]

Next, Figure 2 graphs the average use of the science frame across the type of organization(s) filing the brief over the 1973-2016 time period. Here, for clarity of presentation, I focus on briefs signed by a single group type (representing 73% of the total sample). On average and consistent with Hypothesis 2, amicus briefs from health groups (the solid line) use science framing more often than briefs signed by religious organizations (represented by the line with the open circle). In fact, health groups consistently use science framing at higher levels than all other single-group types, except for one year (2007). That year, in *Gonzales v. Carhart*, one prolife brief filed by the Thomas More Society, a conservative public interest law firm, slightly exceeded the science usage of health groups. In that brief, the word “data” was used 33 times and the word “statistics” 10 times.

While these descriptive findings are suggestive, a multivariate approach is needed to control for other factors that drive framing strategy by amici. Because the dependent variable is a bounded proportion that ranges from 0 to .047, OLS is not an appropriate estimation technique. Following the conventions of existing work (Collins, Corley, and Hamner 2015), I estimate a series of models using fractional logit (Papke and Woodridge 1996) and cluster errors on the case.

[Table 1 about here]

In the first two columns of Table 1, fractional logit models that analyze prolife and prochoice amicus briefs together are displayed.<sup>18</sup> Turning first to the hypothesized expectations for the combined model, we can see by the negative coefficient on the *Prolife* variable that Hypothesis 1's prediction that prolife groups will use the science frame less than prochoice groups is supported. Figure 3 shows that, when all other variables are held at their means, the proportion of language in the science frame is .003 higher for prochoice briefs compared to prolife briefs.

In addition, Hypothesis 2 is supported, as the results show that amicus briefs by health groups utilized the science frame to a greater extent than did religious groups. Briefs filed by a mix of group types that include healthcare or health policy organizations also used significantly more science framing than multi-group briefs without health groups. Interestingly, the use of science framing was not statistically distinguishable between amicus briefs from abortion and reproductive rights groups compared to briefs from religious groups (the excluded reference category), in contrast with the expectations laid out in Hypothesis 3. Briefs filed by government officials utilized significantly less science framing than those from religious groups, but no effect is found for the Solicitor General. When the reference category for single-type briefs is rotated so that health groups are the excluded category (column 2), we see that, compared to health groups, briefs filed by any other type of group are significantly less likely to use science framing.

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<sup>18</sup> Supplemental analysis using the LIWC dictionary word of *biology* as a dependent variable is shown in the Appendix. The results are somewhat weaker but show support for Hypotheses 1 – 3 as well as for most control variables.

Both government and Solicitor General amicus briefs are also significantly less likely than health briefs to use the language of science to frame their arguments.<sup>19</sup>

[Figure 3 here]

Several other variables emerge as predictors of science framing. Consistent with the literature on repetition by amicus groups and litigant-amicus coordination (Collins, Corley, and Hamner 2015; Larson and Devins 2016; Wofford 2015), a litigant's choice to couch their arguments in the language of science has a large, positive impact on framing by amici who take the same side. Holding all other variables at the means, when science framing by the aligned litigant goes from its minimum to maximum value, the predicted effect of amicus science framing doubles in size. The results in Table 1 also show that briefs with more morality and rights framing used significantly less science framing, while the usage of harm-women frames was not related to science framing.<sup>20</sup> Lastly, the time period variables do not appear to exert a significant influence on the use of the science frame.<sup>21</sup>

Next, in columns 3 and 4, I break out prolife and prochoice amicus briefs into separate models in order to evaluate the last three hypotheses. Looking first at the prolife model (column 3), we see strong support for both hypotheses related to competing and complementary frames.

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<sup>19</sup> It should be noted that all but one of the SG briefs in these cases were filed by Republican administrations because of the prevalence of Republican presidents during this time period.

<sup>20</sup> There were no directional expectations associated with this variable in the combined model. It is also worth noting that the frame *harm-women* is only weakly correlated with the *science* frame ( $r = .10$ ).

<sup>21</sup> In order to test whether there was a general time trend for the use of science, an alternate specification included year as a continuous variable, rather than using cut points. However, the results are consistent with the findings from the main model.

Consistent with Hypothesis 4, the more that prolife amici emphasize the frame about harm to women, the more the brief will utilize the science frame as well. Additionally, in support of Hypothesis 5, prolife amicus briefs that use more morality language do emphasize science less frequently, suggesting that the two frames are generally not used in tandem. These findings are consistent with the conclusions of case studies on antiabortion groups, which noted a shift in strategy by some antiabortion groups (Huff 2014; Rose 2007, 2011).

As with the combined models, the more that the aligned litigant uses science framing, the more such framing will be used in prolife amicus briefs. With respect to group types, health-oriented organizations are still more likely to use more science language than most other groups (as indicated by the negative coefficients), except for professional organizations and the residual category (*other*). However, briefs signed by a mix of groups including health organizations are no more likely to use science framing than briefs with a mix of other groups. Lastly, the more signees on a brief, the less science framing appears in the argumentation, and none of the time period variables reach significance.<sup>22</sup>

Moving to the prochoice model (column 4), Hypothesis 6 predicts that amicus briefs that use more language about rights and harm to women will also use more language in the science frame. However, this hypothesis is unsupported, as both *rights* and *harm-women* are significant but in the opposite direction as hypothesized. This would suggest that these alternative frames are competing rather than complementary in their usage. Amicus briefs filed by health organizations (the excluded category) again use more science framing than all other types of

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<sup>22</sup> Using a continuous variable for time, rather than cut points, yields identical results.

groups, and we also see a positive effect for the amount of science framing used by the aligned, prochoice litigant.

Interestingly, in contrast to the findings from previous models, here we do see evidence that framing considerations of prochoice groups may have been influenced by changes to the composition of the Supreme Court and shifts in legal doctrine. As evidenced by the time dummy variables, prochoice amicus briefs filed after the *Casey* ruling use more science framing than similar briefs filed before this decision. This suggests that abortion supporters sought to use science-based arguments under the new undue burden standard in *Casey*. But after the appointment of Justice Alito in 2006, prochoice briefs used less science framing than they had during the previous era. (The post-Alito time period (2006-2016) is not significantly different from the 1973-1992 post-*Roe* era, however.) The post-Alito shift might indicate a calculation by abortion supporters about the kinds of arguments that Justice Kennedy, the new swing voter, might find more palatable – namely, that science might not be their best avenue for persuasion. However, the results from the prolife model do not provide any evidence of similar considerations by amici opposing abortion rights.

## **Discussion**

This study makes several key substantive and methodological contributions. First, I test and fail to find strong evidence for the claim from the social movement literature that the antiabortion movement made a strategic shift toward rhetorical arguments emphasizing science. The results here indicate that, at least in the Supreme Court setting, the framing of science is used more often by prochoice amicus groups than by antiabortion ones, all else equal. Future research might compare movement articulations (e.g., activist speeches and press releases) with amicus filings for the same group to tease out when and why divergences in arguments occur.

However, the finding that both prochoice and prolife health organizations' briefs rely on science frames does help further our understanding of movement-counter movement dynamics. The counteractive lobbying argument contends that groups seek to neutralize their opponents by filing amicus briefs (Solowiej and Collins 2009); the results here extend that argument to the frames used within the briefs. By employing a science frame, an antiabortion group can neutralize their opponent's monopoly on that frame. Science framing lends an air of credibility, establishes boundaries related to expertise, and elevates claims by asserting they are based on neutral evidence (Layzer 2012; Ahmed 2015; Gieryn 1983). For instance, in amicus briefs filed by the prochoice American College of Obstetricians and Gynecologists (ACOG) and the prolife American Association of Pro Life Obstetricians and Gynecologists (AAPLOG), each organization uses its members' credentials and connections to markers of status (e.g., peer-reviewed publications, institutional affiliations) to legitimize and provide credibility for the legal arguments they advance about abortion (Huff 2014). While this study focuses on abortion, future work could extend the approach used here to examine science framing in other areas of health policy as well as environmental litigation. If both sides of a case can point to arguments couched in the language of science, this may make it easier for justices to legitimize their ideologically preferred position.

Interestingly, I do not find evidence that prolife groups, on the whole, were responsive to changes in doctrine and Supreme Court composition, as some previous work has suggested (Rose 2011). But prochoice amici did increase their use of science framing after the Supreme Court's decision in *Planned Parenthood v. Casey* introduced the "undue burden" standard, then de-emphasized it after Justice O'Connor was replaced by Samuel Alito. With Justice Kennedy as the new "swing" justice, it is possible that prochoice groups determined that other ways of



talking about the right to an abortion would be more persuasive. Although beyond the scope of this paper, additional research into the influence of differing frames on Supreme Court decisions would help determine whether, and to what extent, this calculation paid off.

This study also helps to advance the scholarship on amicus briefs by extending a methodological approach to content analysis that, in the judicial literature, has been used primarily to analyze judicial opinions (Bryan and Ringsmuth 2016; Corley and Wedeking 2014; Owens, Wedeking, and Wolfarth 2013). Here, I am able to analyze the content of 359 amicus briefs filed over four decades of abortion litigation before the Supreme Court. A major asset of LIWC is that it allows researchers to create custom dictionaries or use well-validated existing dictionaries about the psychological content of texts (Tausczik and Pennebaker 2010). These features are useful for scholars who want to explore a particular policy area in depth and do so in a systematic way. For instance, other possible applications of LIWC to framing could examine briefs filed in cases related to religious liberty, LGBTQ rights, or affirmative action.

Substantively, the findings also connect to work on the relationship between litigants and amicus curiae groups (Wofford 2015; Collins, Corley, and Hamner 2015). Amici in abortion cases are responsive to the use of science by their aligned litigant, increasing their use of science frame when the party's brief relies more heavily on that framing. While these data do not allow us to establish whether there is formal coordination between litigants and amici, there is anecdotal evidence that this is increasingly occurring (Larson and Devins 2016; Ward 2007; Smith 1998). Future work should continue to explore the nature and impact of such collaborations (see Box-Steffensmeier, Christensen, and Hitt 2013; Wofford 2015).

There are, of course, limitations to this study. While systematic, the LIWC approach to identifying frames focuses on words and phrases, and as such, may miss out on important

context that would be revealed by a close reading of fewer texts. It is also possible that a brief might reference a frame that it is not endorsing; however, by repeating the language associated with that frame, this can have the unintended effect of reinforcing it (Lakoff 2004; Nyhan, Reifler, and Ubel 2013). Other possible approaches to categorizing frames could focus on precedents cited within a brief (Hinkle 2015), the type and number of legal rules proposed (Wofford 2020), or even how a single organization's use of a frame changes across a series of cases. Beyond these points, it is important to acknowledge that framing choices by social movement organizations are likely to vary based on venue and intended audience; persuading the public is a very different enterprise than attempting to persuade the Supreme Court or a state legislature, and different frames could be used simultaneously by the same group. Amicus briefs filed in the Supreme Court are also interjecting their views at a late stage in litigation, after having had the opportunity to see how lower court judges have assessed competing arguments below. The results here do not, then, reflect earlier iterations of linguistic strategies employed by social movement organizations in the same case. Certain types of abortion laws are also unquestionably more amenable to science framing than others. For instance, the Texas law about admitting privileges at issue in *Whole Woman's Health* lends itself well to empirical claims about medical necessity, and the data do show that the average use of science framing was very similar for prolife and prochoice amici in this case. Lastly, the results here cannot answer the question of whether justices are more receptive to certain types of frames than others, leaving that work for future research.

Going forward, there are some indications that divisions in public opinion about science may influence the strategies used by groups in the abortion policy space. In 2016, polling revealed an 11% gap between Democrats and Republicans with respect to their trust in science

and scientific experts; since then, the gap has only increased (Funk et al. 2019), and some issues like climate science show even larger gaps between Democrats and Republicans (Hart and Nisbet 2012). Other work finds that holding anti-intellectualist and populist beliefs decreases acceptance of the scientific consensus on issues like climate change and GMO's (Merkeley 2021). If organizations calculate that Supreme Court justices are similarly divided along ideological lines in their views on science, other ways to frame the issue of abortion may emerge as important in the future.

## References

- Abramowitz, Alan. 1995. "It's Abortion, Stupid: Policy Voting in the 1992 Presidential Election." *Journal of Politics* 57: 176-86.
- ACOG Committee on Gynecologic Practice. 2009. "ACOG Committee Opinion No. 434: Induced Abortion and Breast Cancer Risk." *Obstetrics and Gynecology* 113(6): 1417.
- ACOG Committee on Health Care for Underserved Women. 2014. "ACOG Committee Opinion No. 613: Increasing Access to Abortion." *Obstetrics and Gynecology* 124(5): 1060.
- Adams, Greg D. 1997. "Abortion: Evidence of an issue Evolution." *American Journal of Political Science* 41: 718-37.
- Ahmed, Aziza. 2015. "Medical Evidence and Expertise in Abortion Jurisprudence." *American Journal of Law & Medicine* 41: 85-118.
- Andsager, Julie L. 2000. "How Interest Groups Attempt to Shape Public Opinion Using Competing News Frames." *Journalism & Mass Communication Quarterly* 77(3): 577-592.
- Aries, Nancy. 2003. "The American College of Obstetricians and Gynecologists and the Evolution of Abortion Policy, 1951–1973: The Politics of Science." *American Journal of Public Health* 93(11): 1810-1819.
- Bailey, Michael A., Brian Kamoie, and Forrest Maltzman. 2005. "Signals from the Tenth Justice: The Political Role of the Solicitor General in Supreme Court Decision Making." *American Journal of Political Science* 49(1): 72-85.
- Behuniak-Long, Susan. 1991. "Friendly Fire: Amici Curiae and *Webster v. Reproductive Health Services*." *Judicature* 74(5): 261-2701
- Benford, Robert D., and David A. Snow. 2000. "Framing Processes and Social Movements: An Overview and Assessment." *Annual Review of Sociology* 26(1): 611-639.
- Billings, Deborah L. 2002. "Depression and unintended pregnancy in young women. Women's marital status may not have been accurate in study." *BMJ (Clinical research ed.)* 324(7345): 1097.
- Blanchard, Dallas A. 2002. "Depression and unintended pregnancy in young women. Readers should bear in mind potential conflict of interest." *BMJ (Clinical research ed.)* 324(7345): 1097.
- Boscarino, Jessica E. 2016. "Setting the Record Straight: Frame Contestation as an Advocacy Tactic." *Policy Studies Journal* 44(3): 280-308.
- Box-Steffensmeier, Janet, Dino Christenson, and Matthew Hitt. 2013. "Quality over Quantity: Amici Influence and Judicial Decision Making." *American Political Science Review* 107(3): 446-460.

Bryan, Amanda C., and Eve M. Ringsmuth. 2016. "Jeremiad or Weapon of Words?: The Power of Emotive Language in Supreme Court Dissents." *Journal of Law and Courts* 4(1): 159-185.

Cannold, Leslie. 2002. "Understanding and responding to anti-choice women-centred strategies." *Reproductive Health Matters* 10(19): 171-179.

Chesler, Mark A., Joseph Sanders, and Debra S. Kalmuss. 1988. *Social Science in Court*. Madison: University of Wisconsin Press.

Chong, Dennis and James N. Druckman. 2007. "Framing Theory." *Annual Review of Political Science* 10: 103-126.

Clark, K. and M. Clark 1947. "Racial Identification and Preference in Negro children." In *Readings in Social Psychology*, 1<sup>st</sup> ed. T. Newcomb and E. Hartley, eds. New York: Holt. 169-178.

Collins, Paul M., Jr. 2008. *Friends of the Supreme Court: Interest Groups and Judicial Decision Making*. New York: Oxford University Press.

--. 2012. "Interest Groups and Their Influence on Judicial Policy." *New Directions in Judicial Politics*. Ed. Kevin McGuire. New York: Routledge.

Collins, Paul M., Jr., Pamela Corley, and Jesse Hamner. 2015. "The Influence of Amicus Curiae Briefs on U.S. Supreme Court Opinion Content." *Law & Society Review* 49(4): 917-944.

Corley, Pamela C., Robert M. Howard, and David C. Nixon. 2005. "The Supreme Court and opinion content: The use of the Federalist Papers." *Political Research Quarterly* 58(2): 329-340.

Corley, Pamela C. and Justin Wedeking. 2014. "The (dis) advantage of certainty: The importance of certainty in language." *Law & Society Review* 48(1): 35-62.

Dadlez, Eva M., and William L. Andrews. 2010. "Post-abortion syndrome: Creating an affliction." *Bioethics* 24(9): 445-452.

Deen, Rebecca E., Joseph Ignagni, and James Meernik. 2003. "The Solicitor General as Amicus 1953-2000 How Influential." *Judicature* 87: 60.

Entman, Robert M. 1993. "Framing: Toward clarification of a fractured paradigm." *Journal of Communication* 43(4): 51-58.

Epstein, Steven. 1995. "The construction of lay expertise: AIDS activism and the forging of credibility in the reform of clinical trials." *Science, Technology, & Human Values* 20(4): 408-437.

--. 1996. *Impure science: AIDS, activism, and the politics of knowledge*. University of California Press.

Frimera, Jeremy A., et al. 2015. "A Decline in Prosocial Language Helps Explain Public Disapproval of the U.S. Congress." *Proceedings of the National Academy of Sciences of the United States of America* 112(21): 6591-6594.

Funk, Cary, Meg Hefferon, Brian Kennedy, and Courtney Johnson. August 2, 2019. "Trust and Mistrust in Americans' Views of Scientific Experts." *Pew Research Center*.  
<https://www.pewresearch.org/science/2019/08/02/trust-and-mistrust-in-americans-views-of-scientific-experts/>

Gerrity, Jessica C. 2010. "Building a Framing Campaign: Interest Groups and the Debate on Partial-Birth Abortion." In Schaffner, Brian F., and Patrick J. Sellers, eds. *Winning with words: the origins and impact of political framing*. Routledge. pp.60-77

Gieryn, Thomas F. 1983. "Boundary-work and the demarcation of science from non-science: Strains and interests in professional ideologies of scientists." *American Sociological Review* 781-795.

Glazier, Rebecca A., and Amber E. Boydston. 2012. "The President, the Press, and the War: A Tale of Two Framing Agendas." *Political Communication* 29(4): 428-446.

Gleason, Shane A., and Colin Provost. 2015. "Representing the States Before the US Supreme Court: State Amicus Brief Participation, the Policy-making Environment, and the Fourth Amendment." *Publius: The Journal of Federalism* 46(2): 248-273.

Goddik, Steen. 2002. "Depression and unintended pregnancy in young women. Unmarried women do not show psychological harm from abortion." *BMJ (Clinical research ed.)* 324(7345): 1097.

Goelzhauser, Greg, and Nicole Vouvalis. 2014. "Amicus coalition heterogeneity and signaling credibility in Supreme Court agenda setting." *Publius: The Journal of Federalism* 45(1): 99-116.

Goffman, Erving. 1974. *Frame analysis: An essay on the organization of experience*. Cambridge, MA: Harvard University Press.

Greenhouse, Linda, and Reva B. Siegel. 2011. "Before (and after) Roe v. Wade: new questions about backlash." *Yale Law Journal* 120: 2028.

Guttmacher Institute. 2018. "State Laws and Policies." Available at:  
<https://www.guttmacher.org/state-policy/laws-policies>.

Hafemeister, T. L., and G.B. Melton. 1987. "The impact of social science research on the judiciary." In G. B. Melton (Ed.), *Reforming the law: Impact of child development research* (pp. 27-59). New York: Guilford.

Hart, P. Sol, and Erik C. Nisbet. 2012. "Boomerang Effects in Science Communication: How Motivated Reasoning and Identity Cues Amplify Opinion Polarization About Climate Mitigation Policies." *Communication Research* 39(6): 701-723.

- Hinkle, Rachael K. 2015. "Legal Constraint in the US Courts of Appeals." *The Journal of Politics* 77(3): 721-735.
- Howe, Amy. March 4, 2020. "Argument analysis: Justices grapple with Louisiana abortion law (Updated)." *SCOTUS Blog*. <https://www.scotusblog.com/2020/03/argument-analysis-justices-grapple-with-louisiana-abortion-law/>
- Huff, April N. 2014. "Constructing Abortion's Second Victim: Science and Politics in the Contemporary Antiabortion Movement." PhD diss., UC San Diego.
- Jesuadson, Sujatha and Tracy Weitz. 2015. "Eggs and Abortion: 'Woman-Protective' Language Used by Opponents in Legislative Debate Over Reproductive Health." *Journal of Law, Medicine, and Ethics* 259-269.
- Kahn, J.H., R.M. Tobin, A.E. Massey, and J.A. Anderson. 2007. "Measuring Emotional Expression with the Linguistic Inquiry and Word Count (LIWC)." *American Journal of Psychology* 120: 263-286.
- Kahn, Robert S. 2002. "Depression and unintended pregnancy in young women: Paper raises at least three concerns." *BMJ: British Medical Journal* 324(7345): 1097.
- Kahneman, Daniel and Amos Tversky. 1984. "Choices, values, and frames." *American Psychologist* 39(4): 341-350.
- Kearney, Joseph D. and Thomas W. Merrill. 2000. "The Influence of Amicus Curiae Briefs on the Supreme Court." *University of Pennsylvania Law Review* 148: 743-855.
- Keck, Thomas M. and Kevin J. McMahon. 2016. "Why *Roe* Still Stands: Abortion Law, the Supreme Court, and the Republican Regime." *Studies in Law, Politics & Society* 70 (2016): 33-83.
- Kelly, Kimberly. 2014. "The spread of 'Post Abortion Syndrome' as social diagnosis." *Social Science & Medicine* 102: 18-25.
- Lakoff, George. 2004. *Don't think of an elephant: Progressive values and the framing wars—a progressive guide to action*. White River Junction, VT: Chelsea Green Publishing.
- Larson, Allison Orr and Neal Devins. 2016. "The Amicus Machine." *Virginia Law Review* 102: 1901-1968.
- Layzer, Judith A. 2012. *The Environmental Case: Translating Values into Policy*. 3<sup>rd</sup> edition. Washington, D.C.: CQ Press.
- Lee, Seyoung, and Thomas Hugh Feeley. 2016. "The identifiable victim effect: A meta-analytic review." *Social Influence* 11(3): 199-215.

- Martin, Brian. 1991. *Scientific Knowledge in Controversy: The Social Dynamics of the Fluoridation Debate*. Albany, NY: State University of New York Press.
- Merkeley, Eric. Forthcoming 2021. "Anti-Intellectualism, Populism, and Motivated Resistance to Expert Consensus." *Public Opinion Quarterly* doi:10.1093/poq/nfz053
- Merry, Melissa K. 2016. "Constructing Policy Narratives in 140 Characters or Less: the Case of Gun Policy Organizations." *Policy Studies Journal* 44(4): 373-395.
- Meyer, David S., and Suzanne Staggenborg. 1996. "Movements, countermovements, and the structure of political opportunity." *American Journal of Sociology* 101(6): 1628-1660.
- McCune, Cynthia A. 2003. "Framing reality: Shaping the news coverage of the 1996 Tennessee debate on teaching evolution." *Journal of Media and Religion* 2(1): 5-28.
- Nisbet, E.C. 2005. "The competition for worldviews: values, information, and public support for stem cell research." *International Journal of Public Opinion Research*. 17(1): 90-112.
- Nyhan, Brendan, Jason Reifler, and Peter A. Ubel. 2013. "The hazards of correcting myths about health care reform." *Medical Care* 51(2): 127-132.
- Nyhan, Brendan, Jason Reifler, Sean Richey, and Gary L. Freed. 2014. "Effective messages in vaccine promotion: a randomized trial." *Pediatrics* 133(4): e835-e842.
- Oreskes, Naomi, and Erik M. Conway. 2010. "Defeating the merchants of doubt." *Nature* 465(7299): 686.
- Owens, Ryan J., Justin Wedeking, and Patrick Wohlfarth. 2013. "How the Supreme Court Alters Opinion Language to Evade Congressional Review." *Journal of Law and Courts* 1(1): 35-59.
- Pacelle, Richard L. 2003. *Between Law and Politics: The Solicitor General and the Structuring of Race, Gender, and Reproductive Rights Litigation*. College Station, TX: Texas A&M University Press.
- Pacelle, Richard L. et al. 2018. "Assessing the Influence of Amicus Curiae Briefs on the Roberts Court." *Social Science Quarterly* 99(4): 1253 – 1266.
- Pennebaker, James, Matthias R. Mehl, and Kate G. Niederhoffer. 2003. "Psychological Aspects of Natural Language Use: Our Words, Our Selves." *Annual Review of Psychology* 54: 547-577.
- Pew Research Center. July 7, 2017. "Public Opinion on Abortion: Views on abortion, 1995-2017." <http://www.pewforum.org/fact-sheet/public-opinion-on-abortion/>
- Roh, Jongho, and Donald P. Haider-Markel. 2003. "All Politics is Not Local: National Forces in State Abortion Initiatives." *Social Science Quarterly* 84(1): 15-31.



- Rohlinger, Deana A. 2006. "Friends and Foes: Media, Politics, and Tactics in the Abortion War." *Social Problems* 53(4): 537-561.
- . 2002. "Framing the Abortion Debate: Organizational Resources, Media Strategies, and Movement-Countermovement Dynamics." *Sociological Quarterly* 43(4): 479-507.
- Rose, Melody. 2007. *Safe, Legal, and Unavailable? Abortion Politics in the United States*. CQ Press: Washington, D.C.
- . 2011. "Pro-life, pro-woman? Frame extension in the American antiabortion movement." *Journal of Women, Politics & Policy* 32(1): 1-27.
- Rosenberg, Gerald. 1995. "The Real World of Constitutional Rights: The Supreme Court and the Implementation of the Abortion Decisions." In *Contemplating Courts*. Lee Epstein, ed. CQ Press: Washington, D.C.
- Ruhrmann, Georg, Lars Guenther, Sabrina Heike Kessler, and Jutta Milde. 2015. "Frames of scientific evidence: How journalists represent the (un) certainty of molecular medicine in science television programs." *Public Understanding of Science* 24(6): 681-696.
- Saguy, Abigail C., and Kevin W. Riley. 2005. "Weighing both sides: Morality, mortality, and framing contests over obesity." *Journal of health politics, policy and law* 30(5): 869-923.
- Solberg, Rorie Spill and Eric N. Waltenburg. 2006. "Why Do Interest Groups Engage the Judiciary? Policy Wishes and Structural Needs." *Social Science Quarterly* 87(3): 558-572.
- Solowiej, Lisa A., and Paul M. Collins Jr. 2009. "Counteractive Lobbying in the US Supreme Court." *American Politics Research* 37(4): 670-699.
- Smith, Paul M. 1998. "The Sometimes Troubled Relationship Between Courts and Their 'Friends.'" *Litigation* 24(4): 24-26.
- Spriggs II, James F., and Paul J. Wahlbeck. 1997. "Amicus Curiae and the Role of Information at the Supreme Court," *Political Research Quarterly* 50: 365-86.
- Stewart, Craig O., Daniel L. Dickerson, and Rose Hotchkiss. 2009. "Beliefs about science and news frames in audience evaluations of embryonic and adult stem cell research." *Science Communication* 30(4): 427-452.
- Tausczik, Yla R., and James W. Pennebaker. 2010. "The Psychological Meaning of Words: LIWC and Computerized Text Analysis Methods." *Journal of Language and Social Psychology* 29: 24-54.
- Tushnet, Mark V. 2005. *A court divided: The Rehnquist Court and the future of constitutional law*. New York, NY: W.W. Norton & Co.

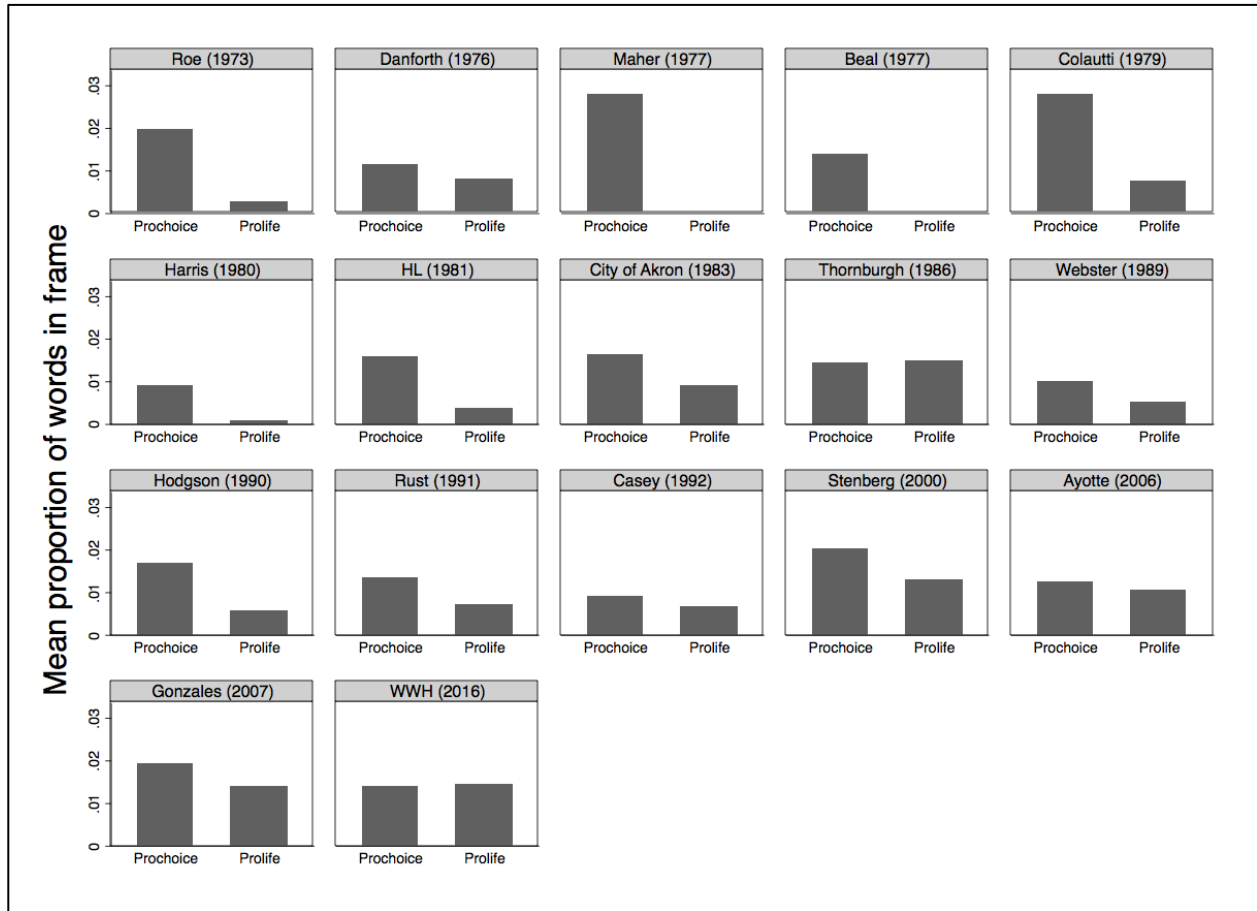
- Ward, Stephanie Francis. 2007. "Friends of the Court Are Friends of Mine." *Supreme Court Report* 93(11): 24-25.
- Wilcox, Clyde, and Barbara Norrander. 2002. "Of Mood and Morals: The Dynamics of Opinion on Abortion and Gay Rights." In Barbara Norrander and Clyde Wilcox, eds, *Understanding Public Opinion*, 2nd ed. Washington, DC: CQ Press.
- Wofford, Claire B. 2020. "Why Try? Comparing the Aims of Parties and Amici in U.S. Supreme Court Litigation." *Justice System Journal* 41(2): 81-97.
- . 2015. "Assessing the Anecdotes: Amicus Curiae, Legal Rules, and the U.S. Supreme Court." *Justice System Journal* 36(3): 274-294.
- Woliver, Laura. 1998. "Social Movements and Abortion Law." In *Social Movements and American Political Institutions*. Anne N. Costain and Andrew S. McFarland, eds. New York: Roman & Littlefield: 233-250.
- Wynne, Brian. 1992. "Misunderstood Misunderstanding: Social Identities and Public Uptake of Science." *Public Understanding of Science* 1:281-304.
- Yang, Jinjie, Kaibin Xu, and Lulu Rodriguez. 2014. "The rejection of science frames in the news coverage of the golden rice experiment in Hunan, China." *Health, risk & society* 16(4): 339-354.
- Ziegler, Mary. 22 January 2019. "The Abortion Wars Have Become a Fight Over Science." *The New York Times*. Available at: <https://www.nytimes.com/2019/01/22/opinion/abortion-roe-science.html>
- . 2018. "The Jurisprudence of Uncertainty: Knowledge, Science, and Abortion." *Wisconsin Law Review* 2018(3): 317-368.
- . 2013 "Roe's Race: The Supreme Court, Population Control, and Reproductive Justice." *Yale Journal of Law and Feminism* 25(1): 1-50.
- . 2009. "The Framing of a Right to Choose: Roe and Wade and the Changing Debate on Abortion Law" *Law & History Review* 27: 281-330.

**Table 1: Fractional Logit Models of Science Framing in Amicus Briefs (1973-2016)**

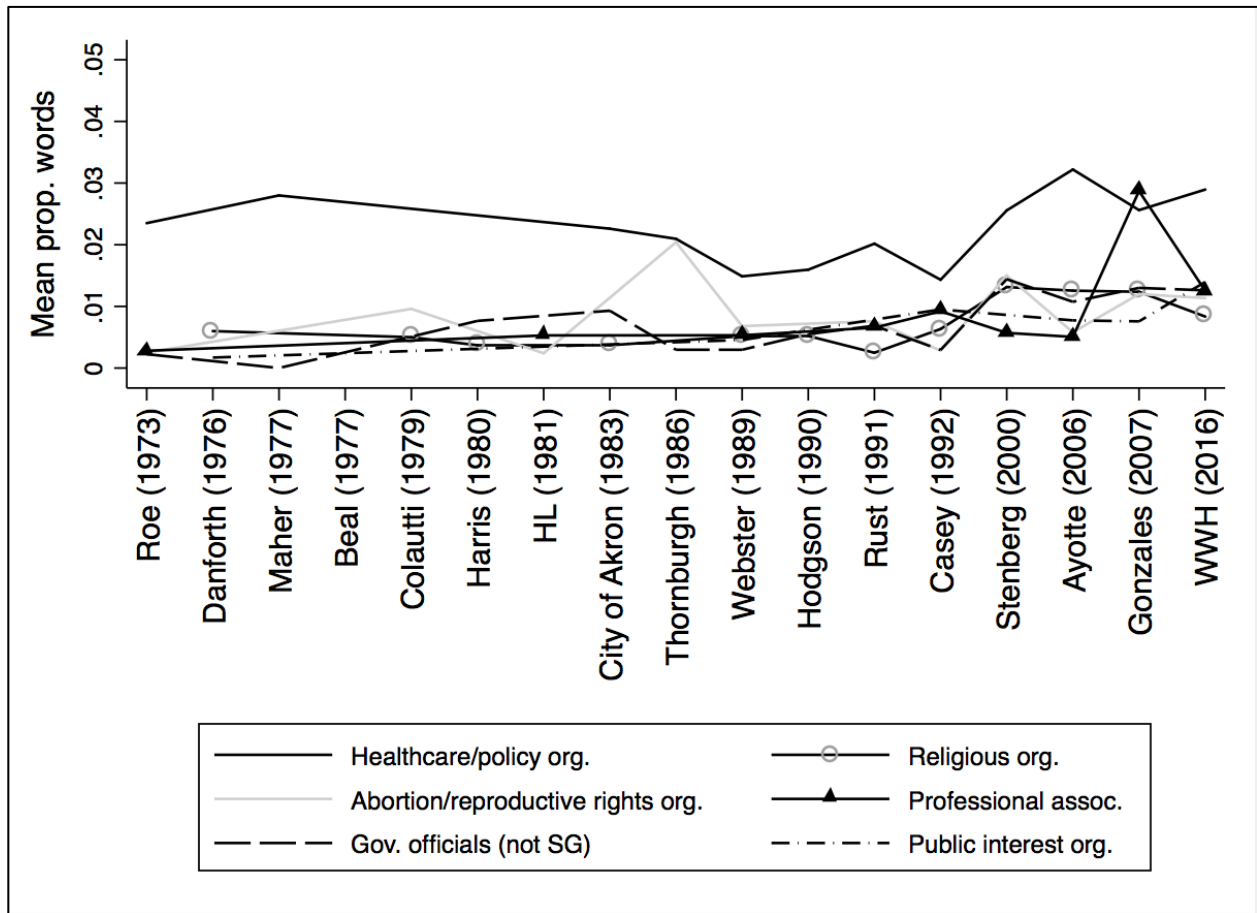
	All Amicus Briefs		Prolife Amicus	Prochoice Amicus
<i>Brief Characteristics</i>	<i>Coef. (RSE)</i>	<i>Coef. (RSE)</i>	<i>Coef. (RSE)</i>	<i>Coef. (RSE)</i>
Prolife position	-.243* (.087)	-.292* (.073)	--	--
Litigant use of science frame in brief	24.9* (5.77)	23.7* (5.00)	37.8* (12.6)	11.8* (2.56)
Morality frame	-13.63* (3.04)	-13.6* (3.04)	-11.99* (4.82)	-11.7 (7.63)
Harm to women frame	2.46 (6.02)	-.223 (6.21)	28.1* (14.3)	-7.39* (3.25)
Rights frame	-35.0* (9.94)	-39.2* (10.7)	-54.0* (7.30)	-30.9* (11.5)
Total groups on amicus brief (logged)	-.006 (.021)	-.035 (.019)	-.056* (.029)	-.043 (.028)
Word count (logged)	.095 (.071)	.084 (.082)	.165 (.141)	-.109 (.136)
<i>Group Attributes</i>				
Health	.595* (.070)	--	--	--
Religious	--	-.523* (.154)	-.362* (.161)	-1.22* (.182)
Abortion/reproductive rights	-.074 (.090)	-.466* (.098)	-.375* (.139)	-.461* (.189)
Government	-.251* (.114)	-.582* (.136)	-.414* (.128)	-.684* (.142)
Solicitor General	-.213 (.142)	-.636* (.178)	-.814* (.160)	-.406* (.131)
Social welfare	-.313 (.163)	-.708* (.179)	-.481* (.155)	-.855* (.252)
Professional association	-.089 (.207)	-.490* (.213)	-.366 (.330)	-.691* (.202)
Other	-.187 (.112)	-.509* (.116)	-.521 (.387)	-.535* (.182)
Health in combination with other groups	.237* (.089)	-.118* (.088)	.070 (.214)	-.145 (.094)
<i>Era</i>				
1993-2005	.141 (.092)	.141 (.092)	-.219 (.276)	.309* (.096)
2006-2016	.067 (.072)	.067 (.072)	-.066 (.196)	.003 (.103)
Constant	-5.06* (.554)	-4.44* (.699)	-5.59* (1.23)	-2.63* (1.18)
N	359	359	193	166
Pseudo R <sup>2</sup>	.029	.027	.033	.021

**Notes:** Model is significant at  $p < .001$ . Errors are clustered on the case. \* denotes  $p < .05$  (two-tailed test).

**Figure 1: Use of Science Frame in Prochoice and Prolife Amicus Briefs, 1973-2016**

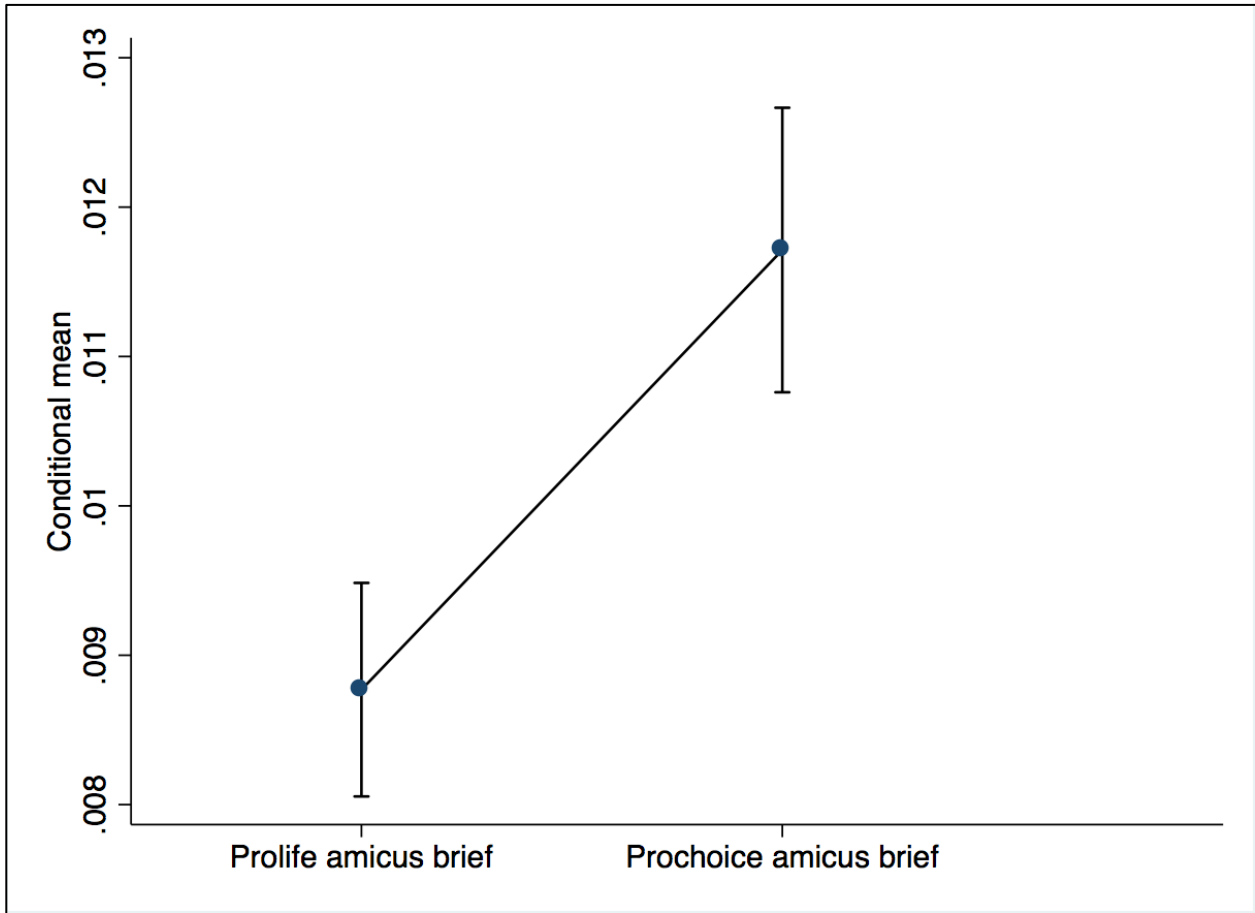


**Figure 2:** Use of science frames by amicus group type



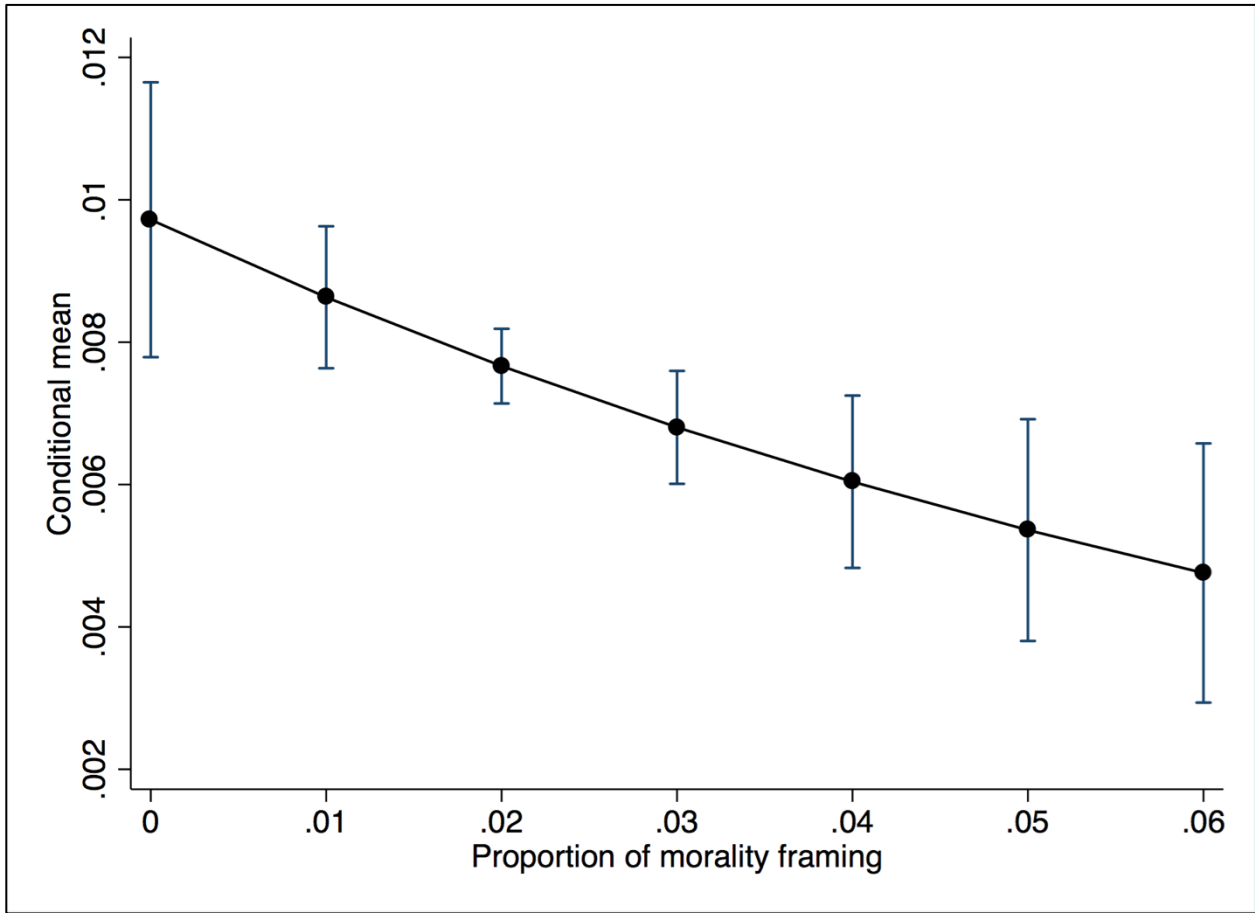
**Note:** Results shown only for briefs with a single group type.

**Figure 3:** Predicted effects of brief position on science framing



**Note:** Predicted effects with 95% confidence intervals.

**Figure 4:** Predicted effects of morality framing by prolife groups on use of science frames



**Note:** Predicted effects with 95% confidence intervals.

**APPENDICES**

**“She Blinded Me with Science”: The Use of Science Frames in Abortion Litigation Before  
the Supreme Court**

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## Appendix A: LIWC Dictionaries

Science	Morality	Harm to Women	Rights
Accepted medical pract*	Abortion doctor*	Abuse*	Autonomy
Accredit*	Abortion industry	Abusive	Bodily integrity*
Adverse reaction	Abortionist	Alone	Choice*
Breast cancer	Alive	Anxi*	Choose*
Causal*	Baby	Ashamed	Decide*
Comorbidity	Babies	Blood*	Decision*
Complication*	Body part*	Bled	Dignity
Data	Child*	Bleed*	Equal*
Diagnos*	Conceive*	Cry	Equit*
Disease	Conception	Crie*	Free*
Evidence	Cruel*	Depress*	Libert*
Expert*	Dead	Emotion*	Privacy
Female*	Death*	Endanger*	Private
Fetal pain	Defenseless	Grief*	Right*
Fetus	Die*	Griev*	
Gynecol*	Dying	Harm*	
Healthcare	Faith	Hemorrhag*	
Maternal mortality	Holy	Hurt*	
Medical necessity	Human*	Infect*	
Medical prof*	Immoral	Lonely	
Mental health	Infant*	Maternal health	
Obstet*	Innocent*	Pain*	
Oncolog*	Kill*	Pressure*	
Physician*	Life	Rape*	
PAS	Mother*	Regret*	
PASS	Murder*	Shame	
PAT	Personhood	Suffer*	
Patient*	Religion	Suicid*	
Peer review*	Sacred	Survivor*	
Physician*	Unborn	Trauma*	
Post abortion distress		Unsafe	
Post abortion psychosis		Upset*	
Post abortion stress		Victim*	
Post abortion syndrome		Violence	
Post abortion trauma			
Probabilit*			
Procedure*			
Public health			
Research*			
Risk*			
Statistic*			
Study			
Studies			

**Note:** \* denotes word stem (e.g., right\* would include both “right” and “rights”). Terms with different hyphenations and spelling variations of the same term are included (“postabortion” “post abortion” and “post-abortion”).

## Appendix B: Amicus group types

Group Type	Examples
<i>Single group type</i>	
Healthcare and health policy	American College of Obstetricians and Gynecologists (ACOG), American Association of Prolife Obstetricians and Gynecologists (AAPLOG), Catholic Health Association, American Nurses Association
Religious groups	U.S. Conference of Catholic Bishops, Southern Baptist Convention, Knights of Columbus, Focus on the Family
Professional associations	National Association of Women Lawyers, Alabama Lawyers for Unborn Children, American Sociology Association
Social welfare organizations	NAACP, ACLU, Concerned Women for America, Center for Constitutional Rights
Abortion or reproductive rights groups	Planned Parenthood, NARAL, Feminists for Life, National Right to Life
Government	Attorney general of New Jersey, 50 Arizona legislators, 20 members of the U.S. Congress
Office of the U.S. Solicitor General (OSG)	Charles Fried, Kenneth Starr, Seth Waxman
<i>Briefs with multiple group types</i>	
Mix of group types including healthcare/policy	Brief by Health Professionals Advancing LGBT Equality, National Center for Lesbian Rights, Bay Area Lawyers for Individual Freedom, and National Black Justice Coalition

**Appendix C: Fractional Logit Models of Biology Framing in Amicus Briefs (1973-2016)**

<i>Brief Characteristics</i>	All Amicus Briefs	
	<i>Coef. (RSE)</i>	<i>Coef. (RSE)</i>
Prolife position	-.064 (.043)	-.093* (.038)
Litigant use of science frame in brief	11.2* (4.60)	8.81 (4.64)
Morality frame	2.45 (1.51)	2.79 (1.67)
Harm to women frame	11.98 (6.20)	10.4 (6.29)
Rights frame	-8.71* (4.41)	-10.7* (4.67)
Total groups on amicus brief (logged)	.016 (.015)	.002 (.015)
Word count (logged)	-.011 (.037)	-.011 (.040)
<i>Group Attributes</i>		
Health	.320* (.045)	--
Religious	--	-.213* (.059)
Abortion/reproductive rights	.001 (.087)	-.184* (.076)
Government	-.078 (.069)	-.232* (.076)
Solicitor General	.092 (.097)	-.114 (.104)
Social welfare	-.161* (.045)	-.346* (.056)
Professional association	-.024 (.069)	-.213* (.077)
Other	-.197* (.048)	-.346* (.045)
Health in combination with other groups	.174* (.043)	.005 (.033)
<i>Era</i>		
1993-2005	-.020 (.062)	-.034 (.063)
2006-2016	.098 (.073)	.090 (.073)
Constant	-3.51* (.261)	-3.17* (.296)
N	359	359
Pseudo R <sup>2</sup>	.006	.006

**Notes:** Model is significant at  $p < .001$ . Errors are clustered on the case. \* denotes  $p < .05$  (two-tailed test).

